



## Your Destination...Our Priority

Minnesota Statewide Transportation Policy Plan: 2009-2028







## Minnesota Department of Transportation

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### Transportation Building

395 John Ireland Boulevard  
Saint Paul, MN 55155-1899

August 2009

Dear Citizens of Minnesota,

I am pleased to share with you Minnesota's Statewide Transportation Policy Plan 2009-2028: Your Destination...Our Priority. This plan is the result of extensive collaboration during the past two years between the Minnesota Department of Transportation and citizens, stakeholders and partners throughout Minnesota. I want to thank everyone who took the time to participate in our outreach meetings and provide comments and suggestions on the draft plan.

The Statewide Transportation Policy Plan establishes a multimodal transportation vision for the State of Minnesota and identifies policies and strategies that support this vision. Although investment directions will continue to evolve over time, there is no doubt that a safe, efficient and sustainable transportation system will remain essential to Minnesota's economic vitality and quality of life. As the state's transportation leader, Mn/DOT embraces its responsibility to uphold the vision and policies presented in this plan.

The success of Minnesota's transportation system depends on the coordinated efforts of many public and private providers, and the policies and strategies outlined in this plan provide the framework for our joint efforts. Mn/DOT will continue to look for opportunities to involve citizens, stakeholders and partners in the implementation of this plan and in future investment and policy decisions. Together, we can realize the shared vision of a safe, efficient and sustainable transportation system.

Sincerely,

A handwritten signature in black ink that reads 'Thomas K. Sorel'.

Thomas K. Sorel  
Commissioner



# **Minnesota Statewide Transportation Policy Plan: 2009 – 2028**

Your Destination...Our Priority

Minnesota Department of Transportation

August 2009

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# **Chapter 1: Executive Summary**

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Transportation is critical in supporting economic vitality and quality of life in Minnesota. For families and individuals, transportation puts goods on store shelves; transports us to work, health care, school and recreational activities; and takes us across the nation and around the world for business and leisure. In addition, transportation is essential for the thousands of manufacturing, retail, wholesale and agricultural businesses in Minnesota. It acts as a lifeline for moving raw materials to manufacturing facilities, farm produce to processing facilities and markets, and finished products to distributors or customers.

The Minnesota Department of Transportation has been developed this plan in cooperation and consultation with its partner transportation providers, both public and private, stakeholders and the general public. It results from work and discussions during a period marked by significant shifts in the focus of the public's transportation concerns, coupled with dramatic changes in the state and national economic outlook.

The process began in the spring 2007 with a series of outreach meetings held throughout the state. Travel trends and system conditions were discussed and stakeholders identified key issues that needed to be addressed. A Steering Committee composed of state and local government representatives

began working through potential approaches to the issues. Work on the plan was postponed in late summer to address the pressing issues related to the Interstate 35W bridge collapse in Minneapolis. Reconvening in January 2008, the committee soon had to factor into the plan a major state funding increase for transportation and legislative directive on bridge rehabilitation.

A second round of outreach meetings was held in July 2008 to share the Steering Committee's work and to discuss the implications of the Chapter 152 transportation funding bill enacted during the 2008 legislative session. Based on this additional stakeholder input, the policies and investment priorities were further developed and refined into the proposed draft plan.

In January 2009, the draft plan was posted for public review on Mn/DOT's Web site and discussed with stakeholders at a series of open houses held statewide. Formal public hearings were held in St. Paul at the end of March, with videoconference links to each of Mn/DOT's eight district offices to provide greater accessibility for public comment. In June 2009, the Steering Committee reviewed a summary of all the comments received along with recommended responses and final revisions leading to this Statewide Transportation Policy Plan and accompanying Statewide Highway Investment Plan.



## Vision: A Safe, Efficient and Sustainable Transportation System

A long-range vision for transportation in Minnesota began to emerge as trends and issues were discussed with stakeholders around the state. **Stakeholders identified a range of desired system improvements, additions and enhancements to transportation necessary to create a safe, efficient and sustainable transportation system for the future.** Key components of this vision include:

- Superior highway connections to adjacent states and Canada
- Active ports in Duluth and along the Mississippi River
- Strong connections to a national high-speed passenger rail network
- Cost-competitive national freight rail connections supported by a network of regional freight rail corridors and intermodal terminals
- Vibrant Twin Cities International Airport “Hub” and secondary supporting airports throughout the state
- Upgraded highways and expanded transit service connecting the regional trade centers throughout the state
- Reliable mobility in the Twin Cities through innovative highway capacity improvements and expanded transitways
- Reliable mobility in Greater Minnesota metropolitan areas through expansion of both the highway network and transit systems
- Additional transit options throughout the state with

improved connectivity between services and modes

- Safe travel throughout the state, with a goal toward zero deaths
- Expanded networks for safe biking and walking
- Infrastructure maintained in safe and structurally sound condition

The vision is broad and far-reaching, and may take the next 50 years to fully realize. But the vision speaks to transportation as a critical ingredient for the continued economic vitality of the entire state and the livability of its communities.

Mn/DOT plays a unique leadership role in upholding the vision and policies presented in this draft plan. As the state's transportation leader, Mn/DOT will:

- Promote a safe, reliable and modern transportation system
- Improve access and enhance the movement of people and freight
- Promote a culture of innovation in the organization
- Become the state transportation leader and employer of choice for Minnesota's diverse population
- Build public trust in the department

Your destination is our priority and Mn/DOT will follow these directions to create a safe, efficient and sustainable transportation system for Minnesota.



## Moving Toward the Vision: Challenges and Opportunities

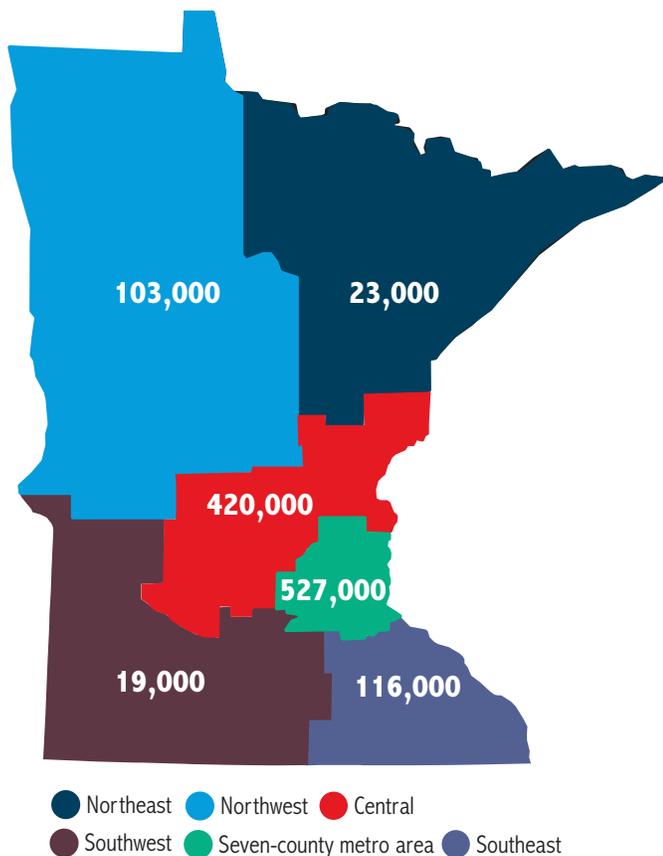
To move Minnesota toward its long-range vision for transportation, there are many challenges to address as well as opportunities to seize. Following are some of the key challenges and opportunities that the Steering Committee considered in developing the policies and strategies put forth in this plan.

### Challenges

#### Growing, Aging and More Diversified Population:

Minnesota's population is expected to grow by 1.3 million during the next 25 years. Much of the growth will be concentrated in Rochester-Twin Cities-St. Cloud metropolitan areas. The population is also aging. By 2030, about 20 percent will be over age 65 and 6 percent will be over age 80. Providing a safe driving environment and transit options will be critical in meeting the mobility needs of these citizens.

**Increasing Global Competition:** Major changes in the global economy during the past decade have greatly affected goods movements and connections to global markets. These trade



**Figure 1.1 Distribution of projected 1.3 million new residents expected by 2035 (2005 base year)**

connections continue to shift in response to global economic demands and changing markets.

**Aging Infrastructure and Declining Physical Conditions:**

Much of Minnesota's transportation infrastructure will require significant rehabilitation or reconstruction during the next 20 years. This is particularly true for much of the state highway "baby boom" bridges constructed in the 1950s and 1960s as part of the federal interstate program. State highway pavement conditions have also declined during the past decade. Other elements of the transportation system - from rail lines and port facilities to highway rest areas and drainage facilities - are also in need of major reinvestment to maintain existing service levels.

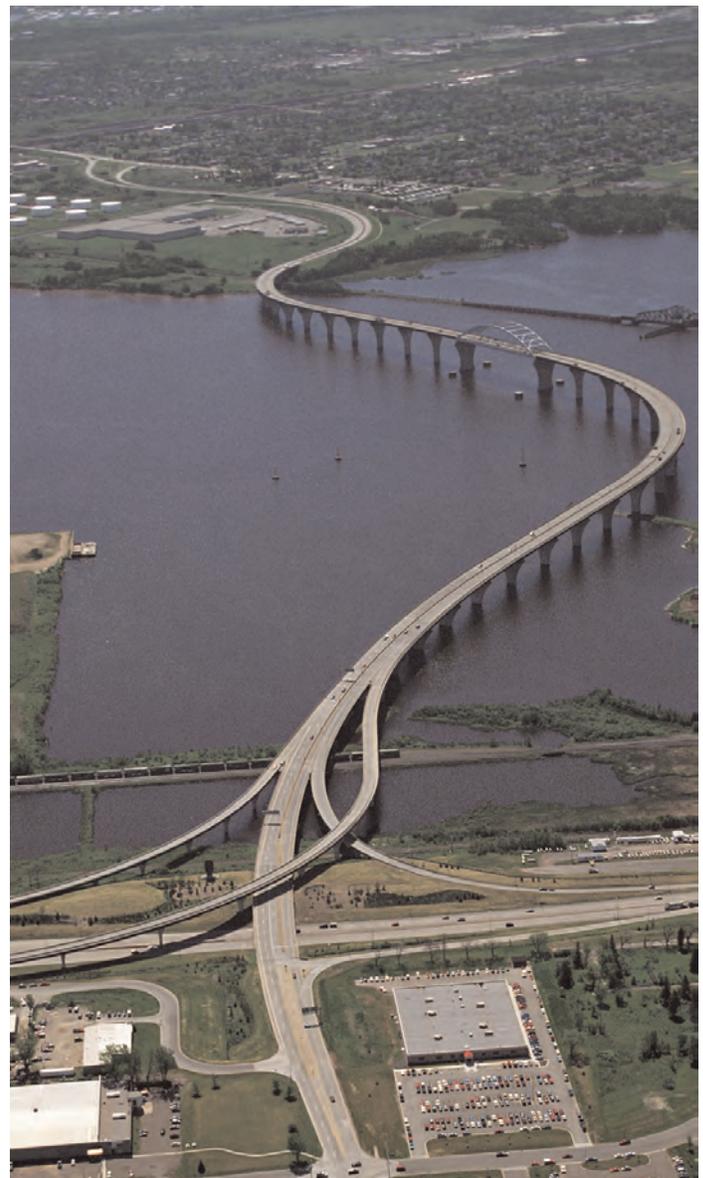
**Concern with Energy and the Environment:**

While cleaner fuels and emission standards have significantly reduced air pollutants such as particulates and carbon monoxide, energy consumption and greenhouse gas emissions associated with transportation have emerged as leading concerns. In 2007, the Minnesota Legislature established goals calling for a carbon dioxide emission reduction of 15 percent by 2015, 30 percent by 2025 and 80 percent by 2050. Transportation contributes 34 percent of all carbon dioxide emissions in the state and is one of the primary sources to be addressed to meet these goals.

**Volatile Revenues and Costs:**

The steady increase in statewide vehicle miles traveled since the 1970s began to level

off in 2004 and actually declined in 2008. The travel reduction coupled with increased vehicle fuel efficiency has led to reductions in federal and state motor fuel tax revenues. General economic conditions since 2001 have also spurred a decline in automobile sales, resulting in lower than expected revenues from the motor vehicle sales tax and license fees. Meanwhile, construction costs have increased dramatically between 2004 and 2008 due to increased worldwide demand for oil, concrete and steel. The current economic recession could lead to lower construction costs but also declining revenues. The volatility in revenues and costs creates a challenging framework for planning improvements to the system during both the short- and long-term, and requires careful attention to risk management.





## Opportunities

**New Approaches to Safety and Congestion:** Mn/DOT is pursuing systematic, data-driven solutions to safety and congestion problems. The approach gives greater priority to low-cost, high-benefit projects that incorporate innovative solutions. Problems are evaluated on a systemwide basis, and solutions implemented in a shorter timeframe than more traditional projects. Examples of these include rumble stripes, cable-median barriers, High Occupancy Toll lanes, capacity additions through shoulder conversions and lane re-markings within existing rights of way.

**Increased Interest in Multimodal Solutions:** In 2004, Minnesota's first Light Rail Transit line - the Hiawatha LRT - opened connecting the Mall of America in Bloomington and downtown Minneapolis. The Northstar Commuter Rail line between downtown Minneapolis and the city of Big Lake is on schedule to open in 2009. There is a growing interest in having alternatives to the highway system to move both people and freight. Several studies are underway to examine the

potential for expanding transit, passenger and freight rail, bicycling and pedestrian systems, as well as designing complete streets to accommodate multiple modes.

### **Increased State Funding and Legislative Direction:**

The Minnesota Legislature approved a significant increase in transportation funding in 2008. This funding included bonding for state highway improvements supported by the first increase in the motor vehicle fuel tax since 1988 and an optional quarter-cent county sales tax to develop and operate transitways in the Twin Cities Metropolitan Area and in Greater Minnesota. The legislation also directed Mn/DOT to develop and carry out, by 2018, a major repair and replacement program for fracture critical and structurally deficient state highway bridges throughout the state.

**Potential New Directions in Federal Transportation Funding:** The future focus and structure of federal transportation funding is currently under debate as policymakers and stakeholders across the country look to the next authorization bill slated for 2010. In the near term, Congress enacted the

American Recovery and Reinvestment Act of 2009 providing more than \$500 million to address transportation needs in Minnesota during the next two years.

**New Expectations for Mn/DOT Leadership and**

**Accountability:** The tragic collapse of the Interstate 35W Bridge in Minneapolis on Aug. 1, 2007, focused the public's attention on transportation and prompted a closer look into the condition and needs of the system. The ensuing months of inquiry and discussion led to a growing recognition among

policy leaders, legislators and the general public that a vital, multimodal transportation system is essential to Minnesota's economy and quality of life. Through legislative hearings, partner consultations and public outreach, Mn/DOT has been asked to play a stronger role as a leader and advocate for Minnesota's transportation system. Policymakers and stakeholders alike want Mn/DOT to provide a clear picture of system needs and priorities for future investments. In addition, they want to better understand how spending decisions are made and the system conditions that will result.





## Moving Toward the Vision: Plan Approach and Guiding Principles

This plan is intended to move Minnesota toward the long-range transportation vision, recognizing the challenges and opportunities involved. The following key principles frame the plan approach and are reflected throughout the policies and strategies.

**1. Continue performance-based planning and investment management:** This plan continues the commitment to performance-based planning established in the 2003 Statewide Transportation Plan. This plan further suggests that performance measures be developed and applied to all modes and jurisdictions as a way to measure progress and the effectiveness of policies and strategies.

**2. Articulate a more multimodal and multi-jurisdictional approach to transportation:**

The 2003 plan was primarily a plan for Mn/DOT and focused on the highway system as the backbone of the transportation system. While this plan continues to acknowledge the importance of the highway system, it also recognizes that a more multimodal and multi-jurisdictional approach to transportation is needed to achieve major goals, including maintaining Minnesota's economic competitiveness, reducing greenhouse gas emissions and providing modal choices for consumers.

**3. Build on existing plans:** Since 2003, several major modal and specialty plans and studies have been completed related to aeronautics, freight, bicycles and safety. Metropolitan Plans have been updated around the state. The policies and strategies in this Statewide Transportation Policy Plan build upon these plans and

studies and, in many instances, identify issues and strategies that need to be examined further in the future.

**4. Concurrently update the 20-year Statewide Highway Investment Plan:**

Mn/DOT develops its long-range statewide highway investment plan in a decentralized manner through the preparation of plans by each of its eight districts. The last update occurred in 2004 after the Statewide Transportation Plan was adopted. To provide stakeholders with a clearer picture of the link between the policy and the investment program, the 20-year Statewide Highway Investment Plan has been updated in tandem with the policy plan process.

**5. Emphasize importance of partnerships:**

Minnesota's transportation system is a complex network of inter-connected modes, owned and managed by a variety of government jurisdictions and private companies. To operate effectively, coordination across modes and jurisdictions is essential. Toward this end, the plan identifies key issues and strategies for consideration by Mn/DOT's partners, who provide key components of the statewide system. The plan begins to set a framework for enhanced coordination and stronger collaboration among Minnesota's transportation partners.

**6. Commit to innovation:** With all the challenges facing Minnesota's transportation system in both the near- and longer-term, innovation is imperative. Creativity and innovation need to permeate every aspect of transporta-

tion service delivery, from how revenues are generated, services are contracted and projects are constructed, to how existing capacity and rights of way are managed.

**7. Seek cost-effective and context-appropriate solutions:**

Given limited financial resources, it is essential that cost-effective and context-appropriate solutions are implemented so that resources can be stretched to provide benefits to the greatest number of users.

**8. Maintain a flexible and opportunistic approach:**

This plan has been developed during a time of significant change, bringing both challenges and opportunities for the future of transportation in Minnesota. The Minnesota Legislature approved increased funding for transportation and directed investments toward a major bridge rehabilitation program. When gas prices peaked in July 2008 at more than \$4 per gallon, Minnesotans drove fewer miles, transit ridership increased, and transportation revenues declined. As of this writing, gas prices have plummeted, the national economy is in serious recession and Congress has approved an economic stimulus bill, a component of which was a major infrastructure investment program. Clearly, the policies and strategies set forth in this policy plan and the highway investment plan may need to be revisited to respond to the evolving challenges and opportunities.





## Moving Toward the Vision: Policies, Strategies and Performance Measures

The policies, strategies, performance measures and targets presented in this plan provide guidance to Mn/DOT for the state highway system and, where appropriate, to other transportation providers responsible for local roads and other modes. As such, this plan seeks to provide a more comprehensive framework to coordinate and integrate the multimodal, multi-jurisdictional networks that compose Minnesota's transportation system.



### Policy 1—Traveler Safety

**Reduce the number of fatalities and serious injuries for all travel modes.** Mn/DOT will continue to support the Toward Zero Deaths initiative and, in cooperation with its partners, pursue a comprehensive “four E” approach to highway safety: Education, Enforcement, Engineering and Emergency medical services. Engineering improvements will focus on systemwide, cost-effective safety investments on both the state and local roads. Mn/DOT will also continue to monitor air travel safety and will work with the Federal Railroad Administration to monitor and report rail safety.

### Policy 2—Infrastructure Preservation

**Ensure the structural integrity of the transportation systems serving people and freight.** Consistent with the directives of the 2008 Minnesota Legislature, Mn/DOT will carry out an investment program to repair and replace fracture critical and structurally deficient state trunk highway bridges

while continuing to work toward achieving condition targets for all state bridges, pavements and other infrastructure. However, given the outlook for future revenues and other competing needs, it is unlikely that all infrastructure condition targets will be achieved for the entire state trunk highway system.

Mn/DOT will apply cost-effective strategies, such as preventive maintenance, pavement reclamation and innovative contracting methods, to maximize available resources and reduce or stem increases in costs. Mn/DOT will also work with other public and private transportation systems of statewide importance to monitor the condition of their physical assets and provide technical assistance where appropriate.

### **Policy 3—Maintenance and Security**

#### **Maintain and operate the statewide transportation system in an efficient, cost-effective and secure manner.**

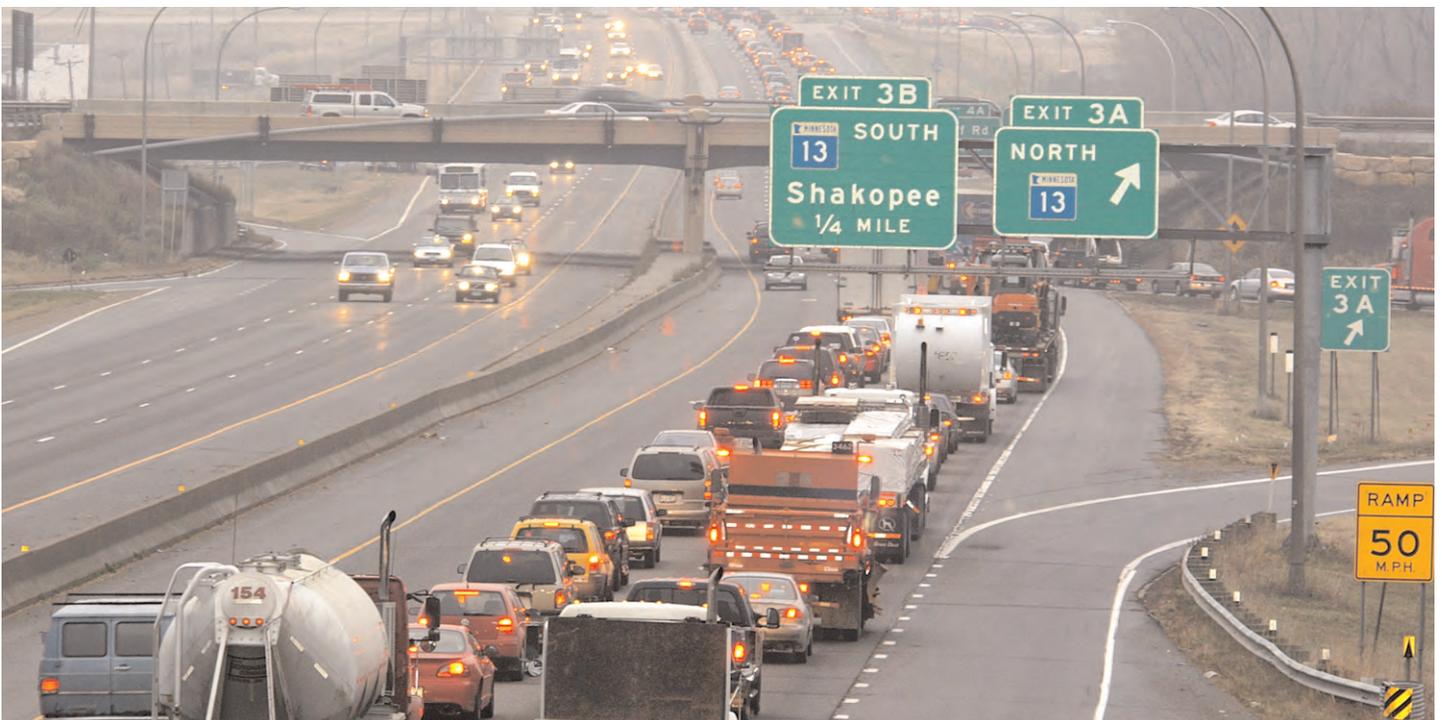
Mn/DOT will use the increase in operating funds provided through the 2008 Legislature to address high priority maintenance needs, including snow and ice removal; bridge, pavement and drainage maintenance; and safety and traffic operations. Mn/DOT will revamp its bridge inspection process to meet new federal requirements, document follow-up procedures to improve the effectiveness of the bridge inspection program,

and emphasize preventive maintenance to ensure public safety and extend bridge life. Mn/DOT will continue to pursue a wide range of opportunities to share costs, resources and best practices with its transportation partners and thereby achieve efficiencies across systems.

### **Policy 4—National and Global Connections**

#### **Maintain and strengthen Minnesota's strategic multimodal connections to the Upper Midwest, the nation and the world.**

During the past 15 years, Minnesota's economy has become more global. Maintaining viable multimodal transportation connections to and from adjacent states, as well as gateways to the rest of the world, has become critical to the state's economic future. Because these connections rely on infrastructure beyond Minnesota's borders, Mn/DOT will continue to work with neighboring states and federal agencies to maintain and improve national and international transportation linkages that are important to Minnesota. Mn/DOT will also continue to work with private industry providers, such as air, rail and waterway transport, to identify approaches that will support maintaining strong national and international transportation connections to Minnesota for people and freight.



## **Policy 5—Statewide Connections**

### **Enhance the movement of people and freight between regional trade centers within Minnesota by providing efficient, multimodal transportation connections.**

Travel between regional trade centers is important for citizens and businesses throughout the state. Strong transportation connections link workers with jobs, raw materials with manufacturers, and recreational users with parks and natural resource areas. In 2000, Mn/DOT created the Interregional Corridor system with the goal of enhancing the economic vitality of the state by providing safe, timely and efficient highway connections between key economic centers throughout the state. Mn/DOT will continue to work with its partners to maintain safety and mobility on these interregional corridors and will identify strategic, cost-effective modal options for statewide travel, such as intercity bus service, high-speed passenger rail, regional freight rail and air service for both passengers and freight.

## **Policy 6—Twin Cities Mobility**

**Provide mobility and address congestion in the Twin Cities by optimizing use of the existing system and making strategic capacity investments in both highways and transit.** This plan moves the region away from its long-held and historical approach of attempting to build its way out of congestion by adding more highway lanes — one major project at a time — to a more innovative, balanced and financially realistic approach to address regional mobility needs. This new approach reflects an understanding that congestion



may be mitigated but not eliminated. It also emphasizes lower cost, systemwide improvements that optimize use of existing highway capacity and rights of way and provide advantages for transit. Examples include improvements in lane continuity, use of shoulders during peak hours, incident clearance and signal timing. Managing demand through metering, traveler information, telework initiatives and potential expansion of pricing is also envisioned. Improvements to expand capacity and/or access will be part of the approach, but these investments will be focused on strategic improvement to both the highway and transit systems. This vision for mobility in the Twin Cities will be more fully articulated through a joint study led by Mn/DOT and the Metropolitan Council beginning in 2009. The findings will be incorporated into the Metropolitan Transportation Policy Plan in 2010 through a formal amendment.

## **Policy 7—Greater Minnesota Metropolitan and Regional Mobility**

**Provide for the changing transportation needs of people and freight within Greater Minnesota regions and metropolitan areas by planning regionally for critical investments and improving coordination across modes and jurisdictions.** A growing and aging population combined with shifts in the economy will put new demands on the transportation system in Greater Minnesota. To address these changes, Mn/DOT will continue to work with the Metropolitan Planning Organizations, Regional Development Commissions and other partners at the local and regional level to identify issues and opportunities for coordinated roadway, transit, bicycle-pedestrian and freight system improvements. Of particular importance will be the joint efforts to examine the changing needs for both transit and freight.

## **Policy 8—Community Development and Transportation**

**Support local efforts to increase jobs, expand housing, and improve community livability through more coordinated planning, complementary design, and timely communication among land use and transportation authorities.** Transportation is a key



ingredient to community livability and local economic development. Local governments must carefully consider and address the transportation needs and implications of their land use and community development decisions. Mn/DOT will work with regional and local partners as well as state agencies to promote the planning and development of local transportation systems that are sensitive to the community context, support local development goals and conform to regional system plans.

### **Policy 9—Energy and the Environment**

#### **Improve the energy efficiency and environmental sustainability of Minnesota's transportation system.**

Mn/DOT and other transportation agencies will continue to protect and enhance the environment by integrating environmental stewardship in the planning, development and construction phases of transportation projects as well as in system operations. Working in close coordination with other transportation system providers, Mn/DOT will also strive to reduce emissions and improve energy efficiency through the

promotion of travel modes with high occupancy and/or low emission vehicles, increased use of alternative fuels and adoption of property and right of way management practices that offset greenhouse gas emissions.

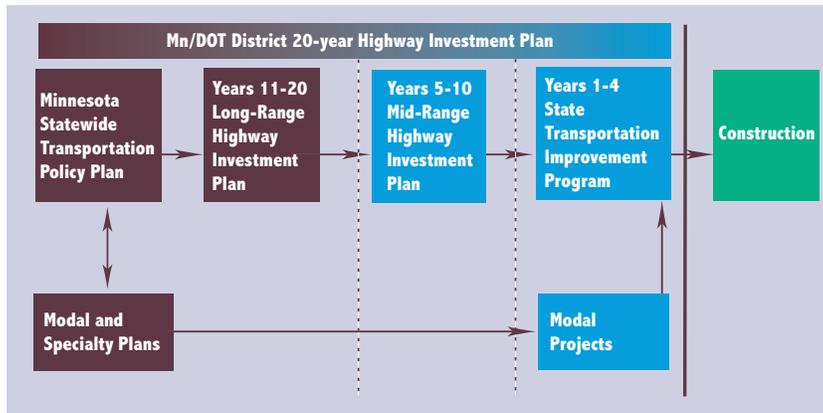
### **Policy 10—Accountability and Transparency**

#### **Strengthen accountability and transparency in the delivery of Minnesota's transportation system.**

To strengthen accountability and transparency in its decision-making, Mn/DOT will set clear and measurable objectives, track progress toward meeting objectives and report results on a regular basis to policymakers and the traveling public. Mn/DOT will develop new approaches and venues to proactively and regularly engage partners and stakeholders in the decision-making process at both the project and broader system levels. A new project scoping, cost estimating and cost management process will improve Mn/DOT's ability to deliver projects on time and within budget.

# Moving Toward the Vision: Mn/DOT Statewide 20-year Highway Investment Plan 2009-2028

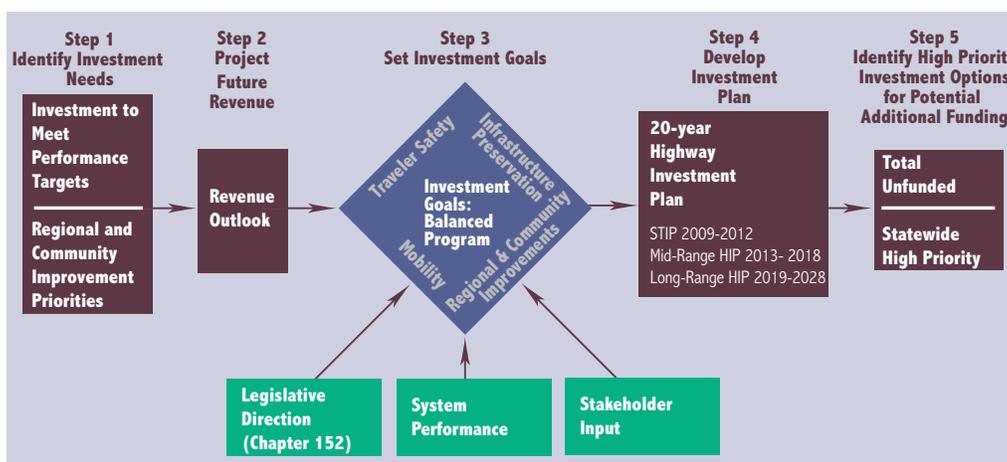
## Mn/DOT's Planning and Programming Process



Concurrent with the Statewide Transportation Policy Plan update, Mn/DOT updated its Statewide Highway Investment Plan. This 20-year plan, last updated in 2004, provides the link between the policies and strategies established in the Statewide Transportation Policy Plan and the capital improvements that are made to the state highway system. The Statewide Highway Investment Plan 2009-2028 is a compilation of eight individual district highway investment plans.

Mn/DOT established a five-step process and guidelines to ensure that the individual district plans would be developed in a consistent, objective manner and that planned improvements would address statewide goals and investment priorities.

## Mn/DOT Highway Investment Plan Development Process



## Step 1—Identify Investment Needs

Investment needs fall into two categories: improvements to address system performance and improvements to address regional and community priorities. Performance-based needs include investments to meet established system

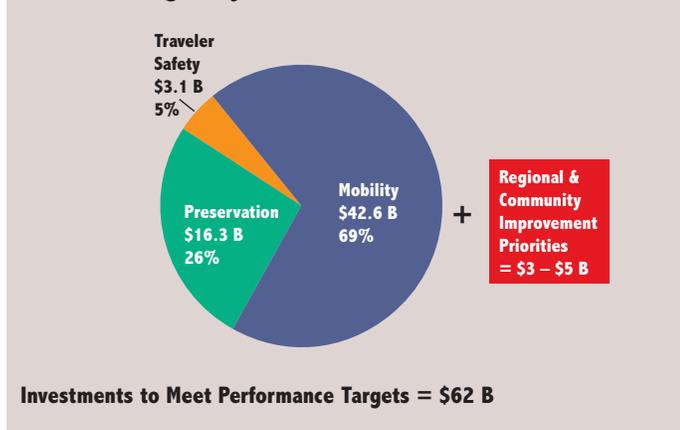
performance targets related to traveler safety, infrastructure preservation, interregional corridor mobility, Twin Cities mobility and Greater Minnesota Regional and Metro mobility. The analytical models and methodologies used to calculate the investments to meet these system performance targets are described more fully in the 20-year Statewide Highway Investment Plan. Regional and community priorities include a wide range of highway improvements to support local business or community development goals, from major highway expansions and new interchanges to intersection modifications, trails and sidewalks.

Statewide, investments to meet system performance targets during the 20-year period are estimated at approximately \$62 billion. Mobility needs related to interregional corridors and congestion mitigation in the Twin Cities and Greater Minnesota urban areas represent the largest proportion, about \$43 billion, or 69 percent, of the total. For now, congestion mitigation needs in the Twin Cities have been estimated based on previously identified needs from the 2004 Metro District Plan. The approach to mobility and congestion mitigation will be further examined in 2009 and will likely result in a revised estimate of need. Infrastructure preservation accounts for

about \$16 billion, or 26 percent, and roadway improvements targeted toward safety total about \$3 billion, or 5 percent of the total needs.

An additional \$3 billion to \$5 billion is needed to address regional and community improvement priorities. This estimate reflects the sum of each district's understanding of local concerns expressed during the past

## Statewide Highway Investment Needs 2009-2028



several years and, as such, does not represent a comprehensive assessment of every potential local request. It does illustrate, however, that there are many demands on available transportation funding beyond the investments needed to meet established statewide performance targets.

### Step 2—Project Future Revenue

Next, revenues were projected based on the trends in state and federal revenue sources for state highway construction. No new sources of revenue were assumed but the increased bond funding for trunk highways enacted by the 2008 Legislature was factored into the projection. Construction cost trends were also analyzed and projected so that investment needs and expenditures could be estimated in year-of-construction dollars. A more complete description of revenue and cost trends and projections is provided in Chapter 5 of the Statewide Transportation Policy Plan. Given the volatility in both costs and revenues and the current discussion of increased funding in the next Federal Transportation Act, the projections assumed in this plan represent a snapshot in time. They will need to be updated annually as long-range investments become programmed in the four-year State Transportation Improvement Program.

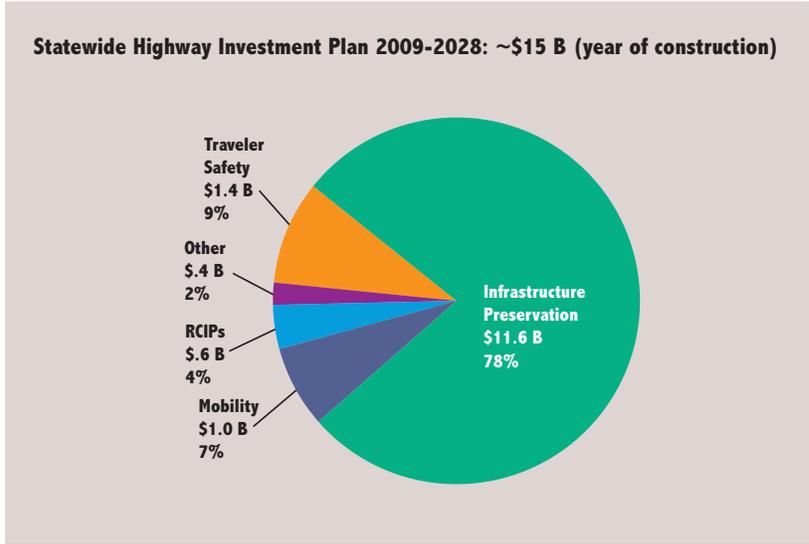
### Step 3—Set Investment Goals

The investment priorities reflected in this update of the Statewide Highway Investment Plan differ significantly from the 2004 plan. At that time, Mn/DOT identified infrastructure preservation as its top priority and districts were directed to fully fund preservation needs before other priorities, including safety, mobility and local community priorities. The revenue and costs outlook in 2004 projected sufficient long-term funding to meet not only preservation needs, but other areas of need as well.

Since 2004, revenues have not grown as anticipated and construction costs have increased dramatically. Even with the increased transportation revenues provided through Minnesota Law 2008, Chapter 152, the costs to fully preserve bridges, pavements and other roadway infrastructure during the next 20 years will exceed projected funding.

The investment goals for this update of the Statewide Highway Investment Plan reflect Chapter 152 legislative direction, consideration of system performance trends and stakeholder input. While infrastructure preservation continues to be an important priority for Mn/DOT, it cannot be the exclusive priority. The goal for the 2009 plan is to lay out a balanced program of investments that:

- Supports the continued development of the statewide economy and livability of Minnesota communities;
- Optimizes the allocation of projected revenues towards four strategic investment priorities of traveler safety, mobility, infrastructure preservation and regional and community improvements; and
- Results in a consistent level of investment effort across districts toward statewide system performance targets, including the investment directions established in Chapter 152 for the rehabilitation or replacement of fracture critical and structurally deficient bridges and other highway improvements.



**Step 4—Develop Investment Plan**

About \$15 billion is projected to be invested statewide over the next 20 years, from 2009-2028. Costs are expressed in projected year-of-construction dollars. Investments to preserve pavements, bridges and other infrastructure average 78 percent of the total for the 20 years. Roadway enhancements and capacity improvements for safety account for 9 percent of the total, with 7 percent planned to improve mobility and 4 percent to address regional and community improvement needs.

As a result of planned investments, Mn/DOT anticipates the repair or replacement of 120 fracture critical or structurally deficient bridges by 2018, consistent with the Chapter 152

legislative direction. In addition, the other 4,000 state highway bridges will receive needed repairs or reconstruction. The number of state highway miles with pavement in good condition will be maintained; however, the number of miles with poor pavement condition will nearly triple, from about 600 miles today to 1,600 miles by 2018.

To improve traveler safety, the planned investments in the first 10 years focus on both systemwide safety enhancements, such as median cable barriers and edge treatments, as well as a few safety/capacity improvements. Other investments for mobility and regional and community priorities are summarized in the 20-year Statewide Highway Investment Plan.

## Step 5—Identify High Priority Investment Options for Potential Additional Funding

With a total estimated investment need exceeding \$65 billion during the next 20 years, and projected revenues of about \$15 billion, this analysis indicates that almost \$50 billion remains in “unmet needs.” To place this level of funding in perspective, every 5 cents on the motor vehicle fuel tax in Minnesota provides just under \$100 million per year to the State Road Construction fund. To meet five percent of the \$50 billion gap, or \$2.5 billion, over the next 10 years would require the equivalent of a 12.5-cent increase in the motor vehicle fuel tax.

It is unlikely that future transportation funding will increase sufficiently to meet almost \$50 billion in “unmet need.” This plan's policies and strategies, therefore, emphasize a new approach to meeting system improvement needs through stronger partnerships and innovation. This is especially evident in the plan's vision for mobility in the Twin Cities, calling for a more comprehensive and fiscally realistic approach to congestion mitigation.

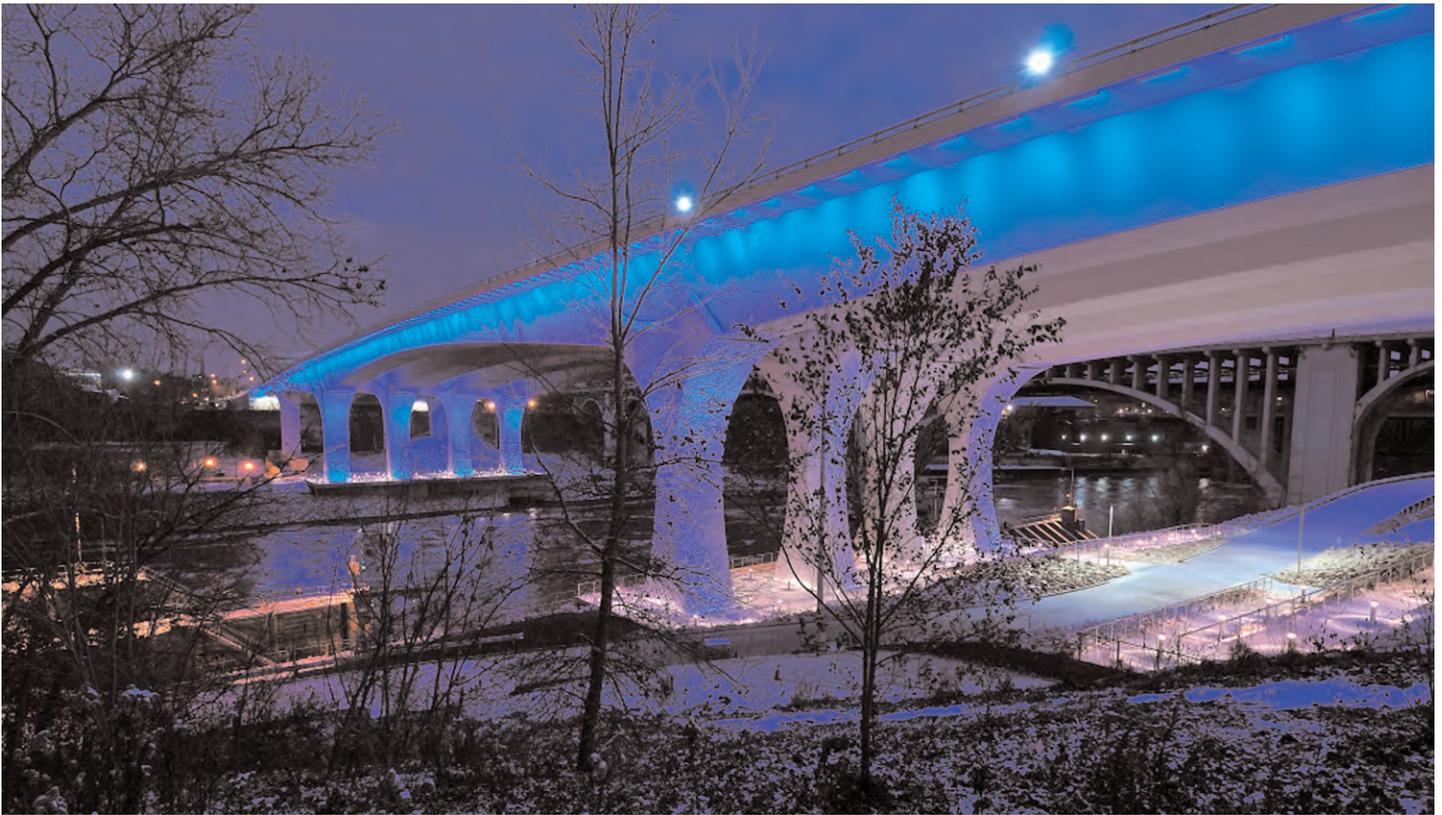
This plan also stresses the need to set priorities. Toward this end, Mn/DOT has identified 5 percent of the “unmet needs” as high priority investment options should additional revenue be available during the next 10 years. Additional funding, such as the American Recovery and Reinvestment Act, would likely carry specific eligibility criteria or investment direction. For this

reason, the identified high priority unfunded investments are distributed across all four strategic investment categories.

### High Priority Unfunded Investment Options

Strategies	\$	%
Enhance Traveler Safety	\$385 M	15%
Improve Mobility on IRCs and Twin Cities Freeways	\$1,030 M	41%
Preserve Infrastructure	\$970 M	39%
Regional Community Priorities	\$115 M	5%
<b>Total</b>	<b>\$2,500 M</b>	<b>100%</b>

These priorities were identified because they would provide the opportunity to enhance traveler safety on rural roads across the state as well as Twin Cities metro freeways, upgrade under performing Interregional Corridors, fund a low-cost/high-benefit congestion management program as well as some key capacity expansion projects in the Twin Cities, preserve pavement and bridges, and support partnership projects for local economic development efforts throughout Minnesota.



## **Moving Toward the Vision: Future Plans and Studies**

Many issues and proposed strategies outlined in this plan will require further in-depth analysis and consultation among the partners, stakeholders and policymakers. Several key studies and investment plans are currently underway or will be initiated soon to evaluate and expand upon the policies and strategies of this plan. The major policies and investment priorities identified in these plans and studies will be incorporated into the Statewide Transportation Policy Plan through an amendment, anticipated in 2010.

### **Greater Minnesota Transit Plan**

The update of the 2001 Greater Minnesota Transit Plan is scheduled for completion in 2009. The plan will define the future vision for public transportation across Greater Minnesota and focus on the needs of four target market groups. It will identify strategies to guide investments to both maintain and expand current transit services across the state.

### **Greater Minnesota Transit Implementation/Investment Plan**

In 2008, the Minnesota Legislature directed Mn/DOT to develop a transit implementation plan that included an analysis of ridership and transit service needs throughout greater Minnesota; a calculation of unmet needs; an assessment of the level and type of service required to meet unmet needs; an analysis of costs and revenue options; and a plan to reduce unmet transit service needs. The plan, to be completed in 2009, will specifically address special transportation service ridership and needs.

### **Intercity Bus Study**

In 2009, Mn/DOT will update the Intercity Bus Study, last updated in 1997. The study's primary objectives include: enhanced coordination and connectivity between public and private sector services; identification of service gaps; formulation of strategies to meet service needs; and improved interface between transportation modes. The results of this study, scheduled for completion in mid-2009, will be incorporated into the Statewide Transportation Policy Plan through an amendment, anticipated in 2010.

## Statewide Freight and Passenger Rail Plan

The Minnesota Statewide Comprehensive Freight and Passenger Rail Plan was mandated by the 2008 Minnesota Legislature and is scheduled for completion in late 2009. The plan will create a vision for both passenger and freight rail services in Minnesota; establish investment needs; identify a potential passenger system network; determine the role of private and public sector entities; set parameters for corridor priorities; and identify potential funding sources. The plan will comply with expected federal state rail plan guidelines and requirements in order to expedite development and funding for proposed and future projects.

## Metro Highway System Investment Study

During the next 12 months, Mn/DOT and the Metropolitan Council will work with other transportation partners to evaluate the metropolitan highway system. The study's goal is to define the long-term (40- to 50-year) vision for the Twin Cities metropolitan area's transportation system. The Metro Highway System Investment Study will guide overall mobility decisions by giving direction to fully use all highway and modal investments in a coordinated manner.



## Regional Freight Studies

The Northern Minnesota/Northwest Wisconsin Freight Study and the Western Minnesota Freight Study will be multimodal and include highway (commercial vehicle operations), rail, waterway, air cargo and intermodal transportation. The studies will examine regional and local issues not captured in previous freight transportation studies and plans; document the existing freight transportation systems; identify industry and region-specific issues and trends as they relate to freight transportation; and identify potential system improvements for freight movement in these regions.

## Long-Range Transportation Funding Options

The 2008 Minnesota Legislature directed that Mn/DOT evaluate the 20-year needs to maintain and improve the state's highways, bridges and transit as well as various funding options to meet those needs. The analysis will be conducted in consultation with other state agencies and stakeholders and will consider the implications of increased fuel economy, availability of alternative modes, and fuel price volatility on various revenue options. The study, due in November 2009, will also look into the potential of road pricing and other alternative funding mechanisms with particular consideration of their environmental impacts and implementation feasibility.





### **Innovative Finance Initiative**

Mn/DOT is working with its transportation partners and stakeholders to explore innovative finance concepts and options for maximizing limited transportation dollars. Through this initiative, Mn/DOT will seek to align user benefits with costs and deliver a greater number of transportation projects more quickly.

### **Americans with Disabilities Act Transition Plan**

The Americans with Disabilities Act Transition Plan will identify physical obstacles in Mn/DOT facilities, describe the methods that will be used to make the facilities accessible, specify the schedule for the taking action, and identify the responsible official. Upon completion, the plan will assist Mn/DOT in meeting ADA requirements.

### **Complete Streets Feasibility Study**

Complete streets are defined as roadways designed and operated to enable safe, attractive and comfortable access and travel for all users: pedestrians, bicyclists, motorists and public transport users of all ages and abilities. Mn/DOT and its partners are assessing the benefits, cost and feasibility of establishing a complete streets policy in Minnesota.

## Chapter 2: Plan Purpose and Development Process

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This Statewide Transportation Policy Plan is the culmination of a process that began in the spring of 2007. The plan sets a long-range vision for transportation in Minnesota and identifies transportation system needs, goals, and priorities over a 20-year period. This chapter summarizes the purpose and role of the plan, and the plan development process. Specifically, the chapter:

- Describes how the plan is used as a guide to Mn/DOT investment decisions as well as a framework for other transportation policy and investment planning efforts.
- Describes how the planning process and the plan satisfy state and federal requirements and guidelines pertaining to state long-range transportation planning.
- Provides an overview of the process, describing the performance-based planning approach, the outreach process, and how stakeholder input was used to establish a 20-year vision and policy goals.

### The Purpose and Role of the Statewide Transportation Policy Plan

The Statewide Transportation Policy Plan is the cornerstone of a family of plans. It establishes a long-range multimodal vision for transportation in the State of Minnesota, examines the most critical trends and issues, and sets the overall policy direction. This overarching plan both draws from and provides direction to the many modal and specialty plans and studies developed by Mn/DOT and its partners (Figure 2.1). These would include but are not limited to Mn/DOT's Strategic Vision; metropolitan, regional, local, and tribal transportation plans; transit, aeronautics, bicycle and pedestrian, and rail plans; freight studies and plans; and safety and operations plans.

As illustrated in Figure 2.1, the planning process is a continuous cycle. Policy plans set the framework for investment plans which identify how the policies will be reflected in implementation. Implementation includes not only state road construction but also capital investment in other modes. Results are monitored through stakeholder input at the plan and project level, market research, and measurement of system performance. The feedback and data gathered are used to inform current and future policy and investment decisions.

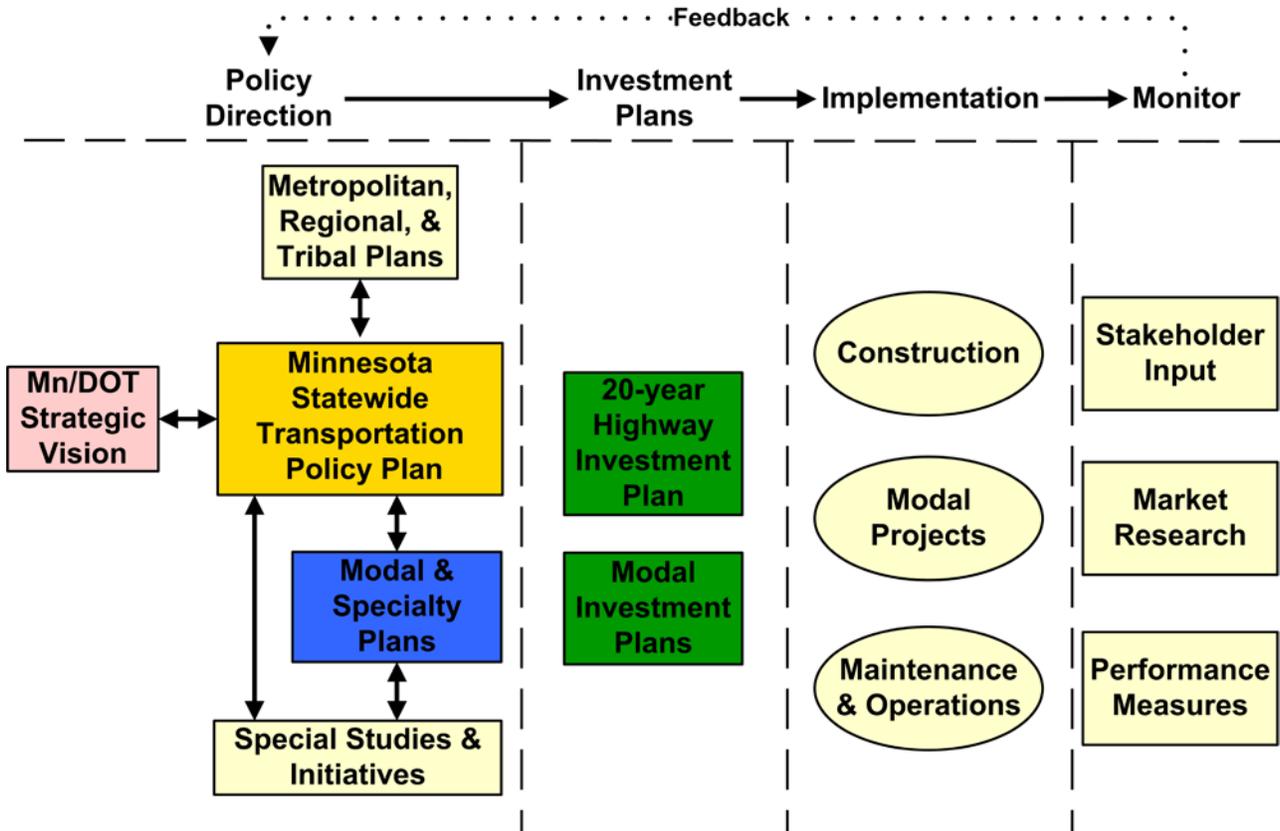


Figure 2.1 Planning and Programming Process

Source: Mn/DOT Office of Investment Management

## Policy Direction

The Statewide Transportation Policy Plan receives and integrates policy direction from a number of sources.

## Mn/DOT’s Strategic Vision

Mn/DOT’s Strategic Vision is to be a global leader in transportation, committed to upholding public needs and collaboration with internal and external partners to create a safe, efficient, and sustainable transportation system for the future. This vision serves as the foundation for all Mn/DOT initiatives including the development of the Statewide Transportation Policy Plan.

## Modal and Specialty Plans

Figure 2.1 highlights Mn/DOT’s responsibility and role in planning and programming for many modes of transportation including freight, bicycles and pedestrians, transit, rail, highways, and aeronautics. Modal plans go beyond the Statewide Transportation Policy Plan, detailing mode-specific trends, issues, investment policies, strategies, and performance measures. Currently, modal plans cover policy and, to a varying degree, provide investment direction. The future intent is to develop investment plans for each

mode comparable to the Statewide Highway Investment Plan. Recently completed or ongoing modal plans include:

- Statewide Freight Plan (2005)
- Mn/DOT Bicycle Modal Plan (2005)
- Minnesota Aviation System Plan (2006)
- Greater Minnesota Transit Plan (update to be completed in 2009)
- Minnesota Comprehensive Statewide Passenger and Freight Rail Plan (to be completed in 2009)

Several additional plans, “specialty plans”, contribute to the formulation of the statewide plan. Specialty plans typically focus on a particular issue or objective such as improving operations, enhancing traveler safety, or improving mobility. Recent examples include:

- Minnesota Statewide Highway Systems Operation Plan (2005)
- Strategic Highway Safety Plan (2007)

### **Special Studies and Initiatives**

In addition to modal and specialty plans, Mn/DOT has completed a number of special studies and initiatives that provide additional policy direction. These studies provide background and analysis that support statewide policy and investment planning:

- Mn/DOT District highway safety plans
- Metropolitan Highway System Investment Strategy
- Feasibility of a Complete Streets policy in Minnesota
- Americans with Disabilities Act Transition Plan
- Regional Trade Centers Study (2003)
- Minnesota Interstate Truck Parking Study – Phase 1 (2008)
- Highway Corridor Studies (e.g., Trunk Highway 5 Corridor Study, I-35 Interregional Corridor Management Plan)

### **Metropolitan Plans**

Minnesota has seven Metropolitan Planning Organizations (MPOs) that are responsible for planning, programming, and coordinating federal highway and transit investments in urbanized areas.

Metropolitan area long range plans identify issues, goals, and policies at the regional level. As shown in Figure 2.2 and listed below, Minnesota MPOs include:

- Duluth-Superior Metropolitan Interstate Council

- Rochester-Olmsted Council of Governments
- LaCrosse Area Planning Committee
- Grand Forks-East Grand Forks Metropolitan Planning Organization
- Fargo-Moorhead Metropolitan Council of Governments
- St. Cloud Area Planning Organization
- Metropolitan Council of the Twin Cities Metropolitan Area<sup>1</sup>



**Figure 2.2 Metropolitan Planning Organizations in Minnesota**

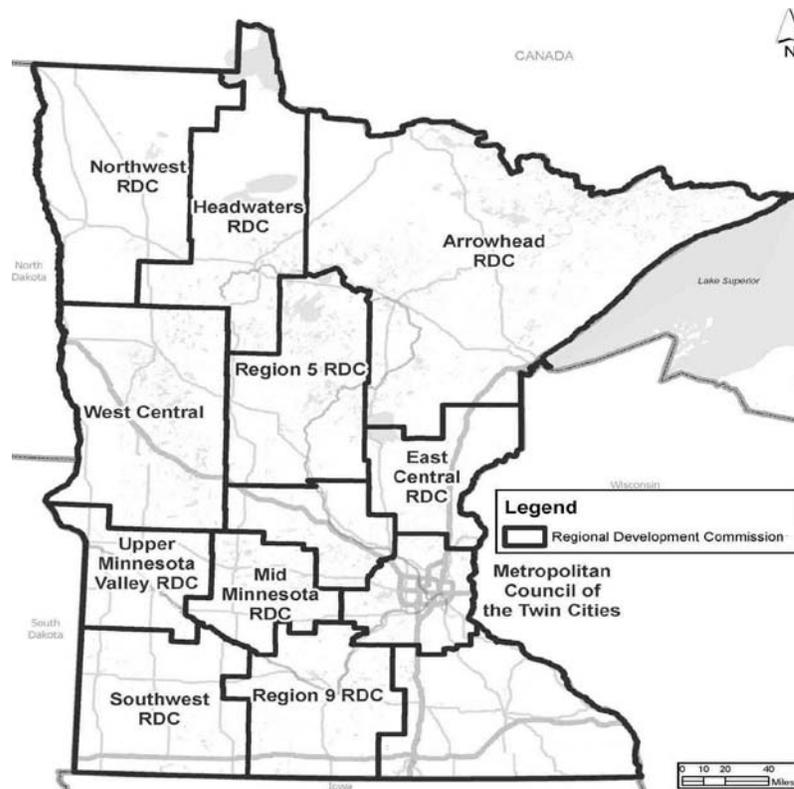
*Source: Mn/DOT Office of Investment Management*

Coordination among statewide and metropolitan planning efforts is crucial for developing a comprehensive and cohesive vision and approach. MPOs are required by federal law to regularly update their regional transportation plan that identifies transportation system needs, goals, and priorities over a 20-year period. The Statewide Transportation Policy Plan also builds on these transportation plans and establishes a metropolitan framework and direction for their update area.

## Regional Development Commissions

The State of Minnesota has 10 Regional Development Commissions (RDCs) that were established to ensure coordination of federal, state, and local comprehensive planning and development programs. As shown in Figure 2.3 and listed below, these commissions include:

- Northwest Regional Development Commission
- Headwaters Regional Development Commission
- Arrowhead Regional Development Commission
- West Central Initiative
- Region 5 Development Commission
- Mid-Minnesota Development Commission
- Upper Minnesota Valley Regional Development Commission
- East Central Regional Development Commission
- Southwest Regional Development Commission
- Region 9 Development Commission



**Figure 2.3 Regional Development Commissions in Minnesota**

Source: Mn/DOT Office of Investment Management

Although each of the regional commissions has its own process and work programs, all provide technical and professional assistance to local governments for transportation planning.

### **Local Governments**

City, county, and township governments are responsible for local transportation planning and land use decisions. Coordination of these efforts with regional and metropolitan transportation planning and the Statewide Transportation Policy Plan will result in more cohesive and consistent decisions.

### **Tribes**

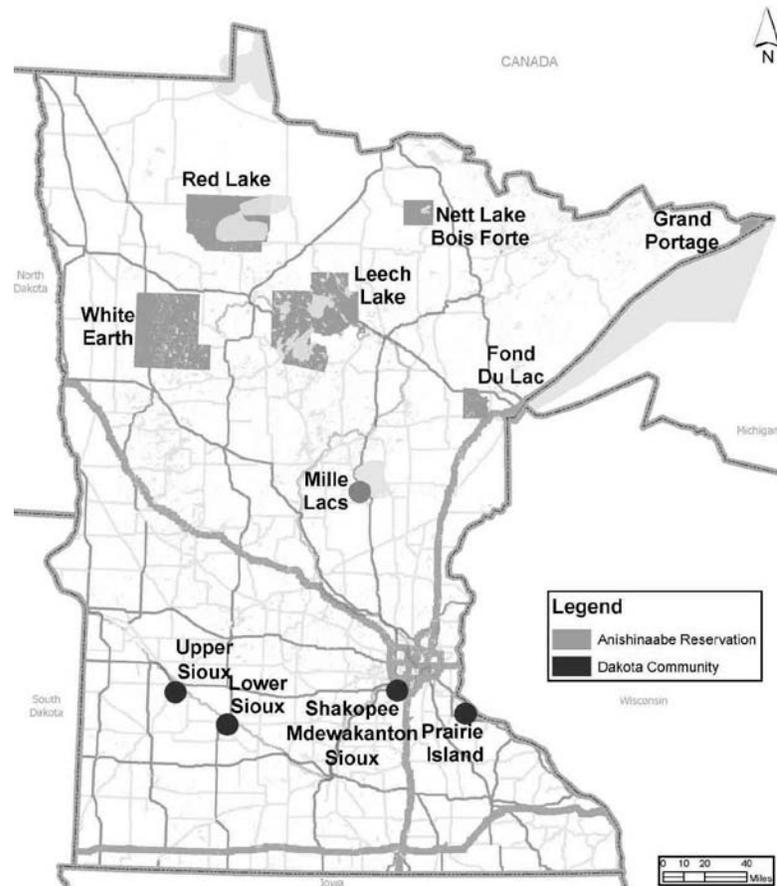
There are 11 federally recognized tribal governments located in Minnesota. Each tribe is a separate sovereign nation, unique unto itself and distinct from all other federally recognized tribes. Each tribe has an independent relationship with the United States and the State of Minnesota. Coordination between state, regional, and local transportation planning efforts and those of the tribes will improve cohesiveness and consistency. These tribes include:

#### **Anishinaabe Reservations**

- Red Lake
- Nett Lake/Bois Fort
- Fond du Lac
- Mille Lacs
- Grand Portage
- White Earth
- Leech Lake

#### **Dakota Communities**

- Shakopee Mdewakanton Sioux
- Prairie Island
- Upper Sioux
- Lower Sioux



**Figure 2.4 Indian Tribal Governments in Minnesota**

Source: Mn/DOT Base Map 2006

## Investment Plans

Completed policy plans direct modal investment plans. The only current stand-alone modal investment plan providing investment direction is the 20-year Statewide Highway Investment Plan. The Statewide Highway Investment Plan aggregates eight Mn/DOT District 20-year Highway Investment Plans, and provides the link between policies and strategies established in the Statewide Transportation Policy Plan and capital improvements made to the state highway system. It identifies capital investment needs, projects future revenue, and identifies expenditures. A future objective is to develop investment plans for each mode similar in scope and purpose to the 20-year Highway Investment Plan.

## Implementation

Implementation covers a range of activities, including maintenance and operations of Mn/DOT facilities and roads, snow removal, and construction of capital improvements to the highway system or other modes. For example, highway improvements may include bridge or pavement reconstruction; transit improvements may include bus purchases or construction of garage facilities and park-and-ride lots; rail improvements may include track reconstruction.

## Monitor and Feedback

The final step in the planning process involves monitoring outcomes and providing feedback to the planning cycle. Mn/DOT monitors the outcomes of its investments, gathering and analyzing stakeholder input, market research, and performance data to inform policy decisions. Stakeholder input, market research, and performance data are an integral part in the formation of the Statewide Transportation Policy Plan. They are also part of an ongoing process of continuous feedback, influencing appropriate decisions throughout the planning and programming process.

## Stakeholder Input

Mn/DOT highly values public involvement and has taken considerable steps over the past decade to ensure everyone's voice is heard. In August 1997, Mn/DOT formed a task force charged with developing an agency guide to public involvement.

This guide, known as *Hear Every Voice*, outlines Mn/DOT's approach to public involvement. Consistent with federal and state requirements and best practices, guidelines emphasize that every plan and project be based on early and continuous stakeholder consultation and public involvement opportunities; provide timely information about transportation issues and decision-making processes to stakeholders; and provide the appropriate level of stakeholder involvement in the planning process. A complete summary of this plan's public involvement effort is provided in the Appendix C.

## Market Research

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*Market research allows for incorporating public input on broader questions regarding policy priorities and level of satisfaction.*

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In addition to the three rounds of outreach completed through this plan, stakeholder input is gathered through ongoing market research. Market research is a customer-based technique to gather data used to reduce risks when making decisions and is a tool to increase understanding of the target market. It is an effective way to involve those who may not or cannot otherwise have their voice heard through more formal participation. Market research allows for incorporating public input on broader questions regarding policy priorities and level of satisfaction with investment decisions and services.

Mn/DOT has used market research methods for years and has conducted several important and revealing market research studies since completion of the 2003 Statewide Transportation Plan. These efforts include the Omnibus Survey, which has been conducted annually since 1987. The Omnibus Survey gauges Minnesotans' opinions on transportation issues ranging from satisfaction with maintenance services to investment priorities. Other specific market research has examined the public's tolerance for congestion, potential acceptance for a mileage-based user fee, perception of Mn/DOT's traffic management tools in the Twin Cities Metropolitan Area (e.g., ramp meters and overhead electronic signs), and perception of changes in speed limits and enforcement levels on state roads.

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*The plan development process is guided by state and federal regulations and statutes.*

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## Federal and State Planning Factors

An important part of the plan development process is guided by state and federal regulations and statutes. The most recent federal transportation authorization bill (SAFETEA-LU), for example, provides guidance in a number of key areas and identifies specific stakeholder groups that must be provided an opportunity to participate in the planning process.

These requirements are codified in the United States Code of Federal Regulations under Title 23, Section 135 (f)(1) and state that “each State shall develop a long-range statewide transportation plan, with a minimum 20-year forecast period for all areas of the State, that provides for the development and implementation of the inter modal transportation system of the State.”

Planning factors were identified in SAFETEA-LU and subsequent guidance documents. These federal planning factors include:

- Support the economic vitality of the United States, the states, metropolitan areas, and non-metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency.
- Increase the safety of the transportation system for motorized and non-motorized users.
- Increase the security of the transportation system for motorized and non-motorized users.
- Increase accessibility and mobility of people and freight.
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.
- Enhance the integration and connectivity of the transportation system, across and between modes and throughout the state, for people and freight.
- Promote efficient system management and operation.
- Emphasize the preservation of the existing transportation system.

Explicit guidance is also given by the State of Minnesota. Minnesota Statute 174.03, Subdivision 1a, requires that an update of the transportation plan occur at least every six years. Furthermore, Minnesota State Statute 174.01, Subdivision 2, identifies the goals of Minnesota’s transportation system. These include:

- Provide safe transportation for users throughout the state.
- Provide multimodal and intermodal transportation that enhances mobility and economic development and provides access to all persons and businesses in Minnesota while ensuring that there is no undue burden placed on any community.
- Provide a reasonable travel time for commuters.
- Provide for the economical, efficient, and safe movement of goods to and from markets by rail, highway, and waterway.

- Encourage tourism by providing appropriate transportation to Minnesota facilities designed to attract tourists.
- Provide transit services throughout the state to meet the needs of transit users.
- Promote productivity through system management and the utilization of technological advancements.
- Maximize the long-term benefits received for each state transportation investment.
- Provide funding for transportation that, at a minimum, preserves the transportation infrastructure.
- Ensure that the planning and implementation of all modes of transportation are consistent with the environmental and energy goals of the state.
- Promote and increase the use of high-occupancy vehicles and low-emission vehicles.
- Provide an air transportation system sufficient to encourage economic growth and allow all regions of the state the ability to participate in the global economy.
- Increase transit use statewide by giving highest priority to the transportation modes with the greatest people-moving capacity and lowest long-term economic and environmental cost.
- Promote and increase bicycling as an energy-efficient, nonpolluting, and healthful form of transportation.
- Reduce greenhouse gas emissions from the state's transportation sector.
- Accomplish these goals with minimal impact on the environment.

## The Plan Development Process

This performance-based plan has been developed by Mn/DOT in cooperation and consultation with its partner transportation providers, both public and private, stakeholders, and the general public. It results from work and discussions over a two-year period beginning in the spring of 2007.

### A Performance-Based Approach

In 2003, Mn/DOT adopted its first performance-based state plan. That plan identified outcomes for 10 policy areas and established specific performance measures and targets or in some cases identified areas for the future development of measures and targets.

Following adoption of the 2003 Statewide Transportation Plan, Mn/DOT's eight transportation districts developed long-range district plans that identified the investments needed to meet the performance targets and also set investment priorities within projected available revenues. These plans won the Transportation Planning Excellence Award from the Federal Highway Administration in 2006.

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*The focus on and inclusion of performance measures, indicators, and targets has been retained in this update.*

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The focus on and inclusion of performance measures, indicators, and targets has been retained in this update. Performance measures, indicators, and targets provide quantitative information to transportation authorities and decision-makers. Measures are used to track system performance over time for a broad set of system characteristics such as condition of infrastructure, traveler safety, and traffic congestion. Numerous existing performance measures and indicators have been incorporated into this plan and several new measures are proposed.

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*Mn/DOT's senior leadership is briefed quarterly on the status of system performance as well as internal operations.*

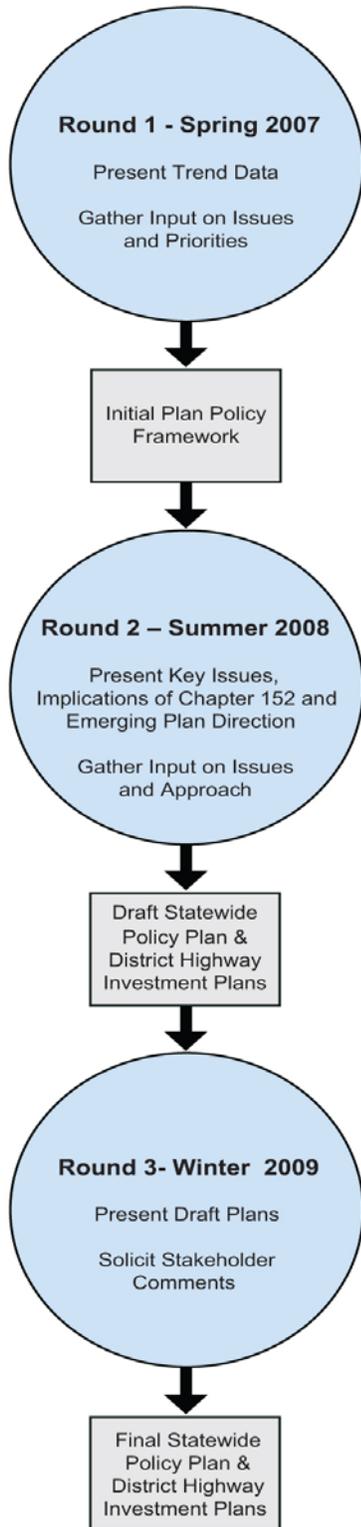
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As part of the overall effort to incorporate performance information into the investment decision-making process, Mn/DOT's senior leadership is briefed on the status of system performance for the various modes including highways, transit, bicycles and pedestrians, aeronautics, and freight as well as that of internal operations. The annual highway infrastructure report, for example, provides core information on Mn/DOT's progress toward its performance goals for the highway infrastructure. These reports include performance data for pavements, bridges, serious injury crashes, Twin Cities Metropolitan Area (TCMA) congestion, and interregional corridor (IRC) mobility.

### **Developing the 2009-2028 Statewide Transportation Policy Plan**

The development of the Statewide Transportation Policy Plan was advised by a Statewide Plan Steering Committee with primary support provided by Mn/DOT's Office of Investment Management (OIM) and technical support provided by subject specific, technical working groups. The Steering Committee included Mn/DOT's central and district leadership, directors of Mn/DOT specialty offices, and representatives of key external stakeholders, including state and federal agencies, Metropolitan Planning Organizations, cities, and counties. The Steering Committee met regularly throughout the plan development process to review progress, consider the broader vision, and advise on general policy direction. Committee members examined trends and issues, reviewed technical workgroup recommendations, and considered stakeholder feedback.

The plan is the result of analysis and discussions over a two-year period. As illustrated in Figure 2.5, it began in the spring of 2007 with a series of outreach meetings held across the state. Regional and local transportation stakeholders identified and discussed the transportation issues they felt were important to their region and state. The planning team identified the following themes from the feedback provided in this first round of outreach:



**Figure 2.5 Stakeholder Outreach**  
 Source: Mn/DOT Office of Investment Management

- Mn/DOT should set priorities for its limited funding, but should also get additional funding.
- System preservation should remain a top priority but other areas, such as operations and maintenance, should not be overlooked.
- Mn/DOT should focus on these key system performance needs:
  - Interregional Corridors
  - Metropolitan Area Congestion
  - Safety
- The plan should address the challenges of increasing freight traffic.
- Mn/DOT should increase the role of transit in the state.
- Stronger partnerships to support local economic development are needed.

The Steering Committee met for the first time in June 2007 to consider the comments received in the first round of outreach and to identify major issues to be addressed in the statewide plan update. Following the tragic collapse of the I-35W Bridge on August 1, 2007, a decision was made to suspend the formal planning process as Mn/DOT staff focused on more immediate issues. Over the next six months, the planning team worked with the technical working groups to address the issues and objectives as identified by the through the first round of outreach and refined by the Steering Committee. The working groups examined trend data and developed proposed policy directions, performance measures, and strategies.

The Steering Committee reconvened in January 2008 and met monthly through June 2008 to consider input from the technical working groups and establish draft policy objectives, strategies, performance measures, and targets. Figure 2.5 shows that a second round of outreach meetings was held in July 2008 to share the results of the Steering Committee work and the implications of the Chapter 152 transportation funding bill enacted during the 2008 Minnesota Legislative session. The second round of outreach produced robust feedback, which is summarized here and more fully documented in Appendix C:

- Mn/DOT’s proposed state highway priorities and strategies for available funding are in general appropriate.
- The Chapter 152 Bridge Program is necessary to address the state’s bridge needs.

- High benefit/low cost strategies to address safety and mobility needs are an appropriate use of funding.
- Alternate modes of transportation and multimodal connections are important part of Minnesota's transportation future.
- Stronger partnerships and the flexibility to respond to local partnership opportunities are needed.
- Mn/DOT should be a stronger advocate for transportation funding and clearly communicate all of its transportation needs to the public and legislature.
- The plan should emphasize the importance of the transportation system (all modes) to the economic vitality of the state.
- Mn/DOT should make its decision-making processes more transparent and easily understandable by the public.

In the fall of 2008, Mn/DOT developed a draft plan which incorporated input from the Steering Committee as well as the comments received throughout the first two rounds of outreach. In late January, the draft plan was posted on the web for public review. Individuals and groups had the opportunity to submit comments in a variety of ways: electronically on the Mn/DOT website using a specially designed online public comment tool, by US Mail, email, facsimile, or telephone.

In February and March of 2009, the third and final round of outreach meetings were held in the form of open houses, one in each of the eight Mn/DOT Districts. During these open house meetings, participants had the opportunity to ask questions and submit comments verbally or on comments cards. In addition, two formal public hearings were held in March of 2009 to gather testimony on the Statewide Transportation Policy Plan. These hearings were conducted via video conference, which allowed for testimony to be received from 16 remote locations throughout the state. Overall, more than 300 people participated in the open house meetings, and 22 individuals, 11 stakeholder groups and 4 government agencies either provided testimony at the public hearings or submitted written comments.

Comments received on the Draft Statewide Transportation Policy Plan during the public review period are summarized below. While many comments focused on the need for additional information or suggested a detailed strategy, several general themes emerged:

- The multimodal approach to transportation outlined in the plan was broadly supported by a wide spectrum of stakeholder groups.
- The plan should more fully address other modes such as transit and passenger rail, and bicycle and pedestrian facilities, and other policy issues such as Complete Streets, Americans with Disabilities Act (ADA) conformity, and the need for Twin Cities congestion targets and additional mobility measures.
- Noting that the plan included an investment plan for highways but not for the other modes, Mn/DOT should develop similar investment plans for transit, freight, passenger rail, aeronautics, and other modes.

- Interest in developing long-range investment plans for system operations.

Comments, proposed responses, and proposed changes to the draft plan were presented to the Steering Committee on June 4, 2009 and Mn/DOT's Transportation Program Investment Committee (TPIC) on June 8, 2009. The TPIC recommended that the Commissioner adopt the plan with the changes identified.

Several changes were made to the draft plan based on the input received. Perhaps the most significant change was the separation of the Statewide Highway Investment Plan from the body of the policy plan. Although developed and reviewed concurrently, the Statewide Transportation Policy Plan and the Statewide Highway Investment Plan will be published as two distinct documents. In the future, Mn/DOT will develop modal (rail, transit, aeronautics etc.) investment plans in a similar manner to the Statewide Highway Investment Plan. These modal investment plans will identify performance-based needs and associated costs, project future revenues and identify investment priorities over the planning period.

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<sup>1</sup> The Minneapolis-Saint Paul Metropolitan Area is a federally designated transportation management area (TMA). A TMA is an urbanized area with population greater than 200,000 that must meet additional federal requirements for continuation and comprehensive transportation planning, including addressing congestion management based on a metropolitan-wide strategy.

## Chapter 3: Transportation Systems Description

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People and communities throughout the state depend on transportation services to meet their mobility needs. While the population increases and the state's economy expands, the demand for these services continues to grow. The transportation systems within the state provide an essential link for individuals traveling to work, school, medical appointments, and social activities.

There are a number of transportation systems that make up the state's transportation network. The first section of this chapter describes the state's highway system, and the second section highlights other modes of transportation including transit, passenger and freight rail, passenger aviation, air cargo, and waterway transportation.

### Highway System

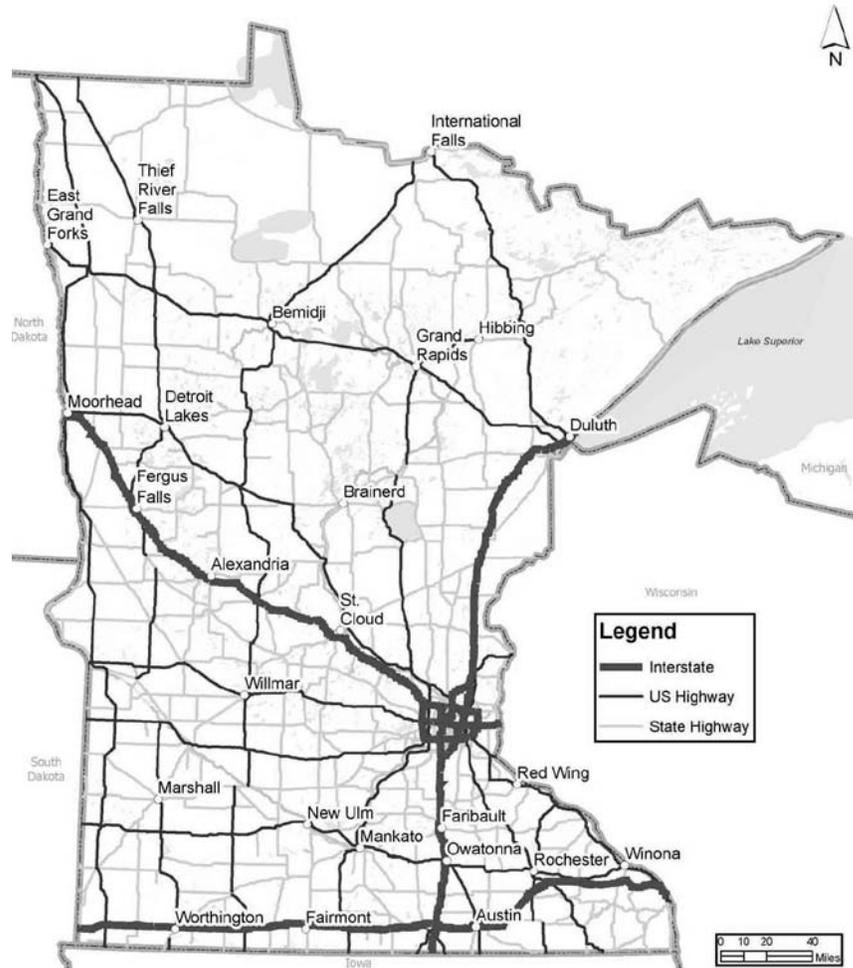
Mn/DOT is directly charged with constructing, operating, maintaining, and managing the state highway system (i.e., Interstates, US Highways, and State Trunk Highways) shown in Figure 3.1. Minnesota has more than 141,000 miles of streets and highways and 20,265 bridges. The state's 3.9 million licensed drivers own approximately 4.8 million registered vehicles. Minnesota's roadway network includes state highways, county roads and highways, and city and township streets and roads. State highways account for eight percent of all roadway miles but carry 58 percent of all traffic. Table 3.1 shows how roadway mileage and travel are distributed among jurisdictions in Minnesota.

**Table 3.1 Minnesota Roadways: 2007 Vehicle Miles of Travel Share and Mile Share**

Road System	Annual Vehicle Miles Traveled (VMT, Billion)	Share of Annual VMT (%)	Miles	Share of Miles (%)
State Highways	33.41	58	11,883	8.4
County State Aid Highways	12.87	22	30,544	21.7
Municipal State Aid Streets	4.53	8	3,221	2.2
County Roads	1.04	2	14,403	10.2
Township Roads	1.19	2	58,166	41.2
City Streets	4.33	8	18,800	13.3
Other Roads	0.04	<1	4,025	2.9
<b>Total</b>	<b>57.41</b>	<b>100</b>	<b>141,042</b>	<b>100</b>

Note: Shares may not sum to 100 percent due to rounding.

Source: Mn/DOT Office of Transportation Data and Analysis



**Figure 3.1 Minnesota State Highway System**

Source: Mn/DOT Office of Investment Management

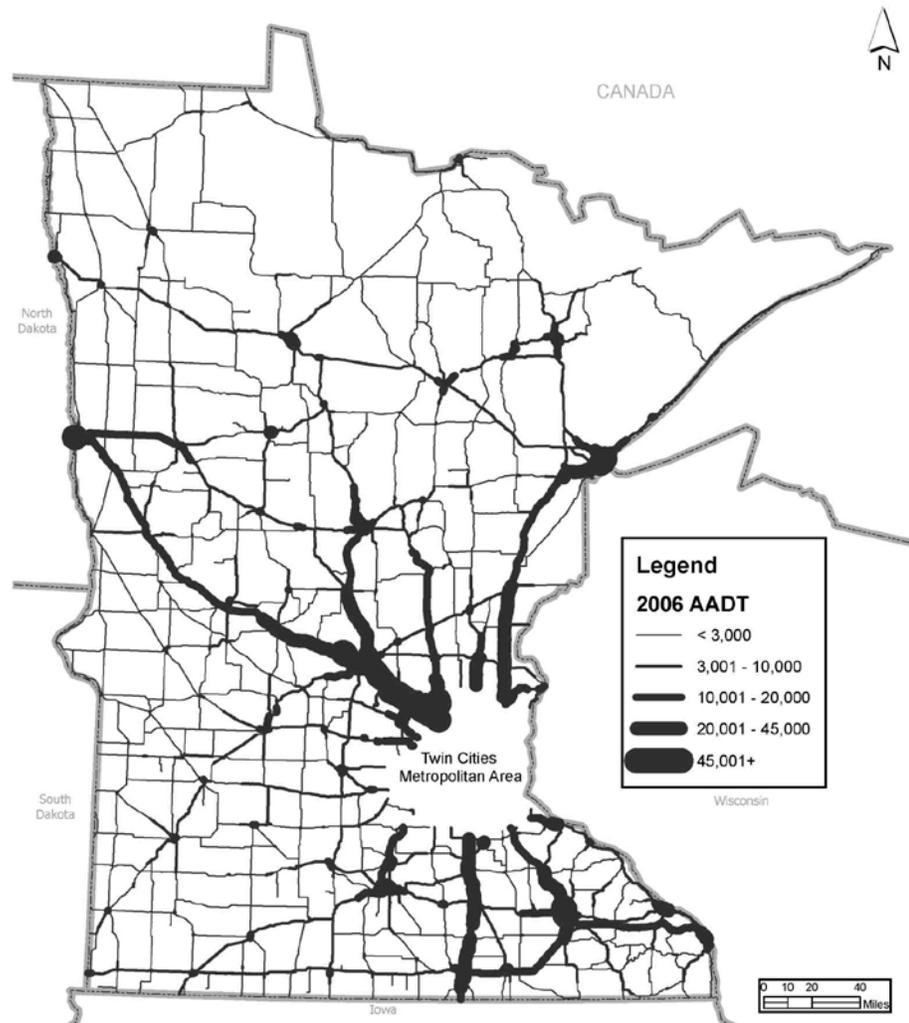
The state highway system consists of 11,883 miles of roadways and 3,585 bridges. Table 3.2 shows the mileage and travel on the state highways by functional classification. The Highway Functional Classification System is a means of classifying roads and distinguishing among them by the service function they provide. The majority of daily travel, 83 percent, takes place on roadways classified as principal arterials, which are intended to provide the highest level of mobility on the highway system.

**Table 3.2 State Highway System, Miles and Travel by Functional Classification**

Functional Classification	Miles	Share of Miles (%)	Daily VMT (Million)	Share of Daily VMT (%)
Principal Arterial	5,250	44	75.70	83
Minor Arterial	5,577	47	14.62	16
Collector	1,046	9	1.21	1
Local	10	0.1	0.01	0.01
<b>Total</b>	<b>11,883</b>	<b>100</b>	<b>91.54</b>	<b>100</b>

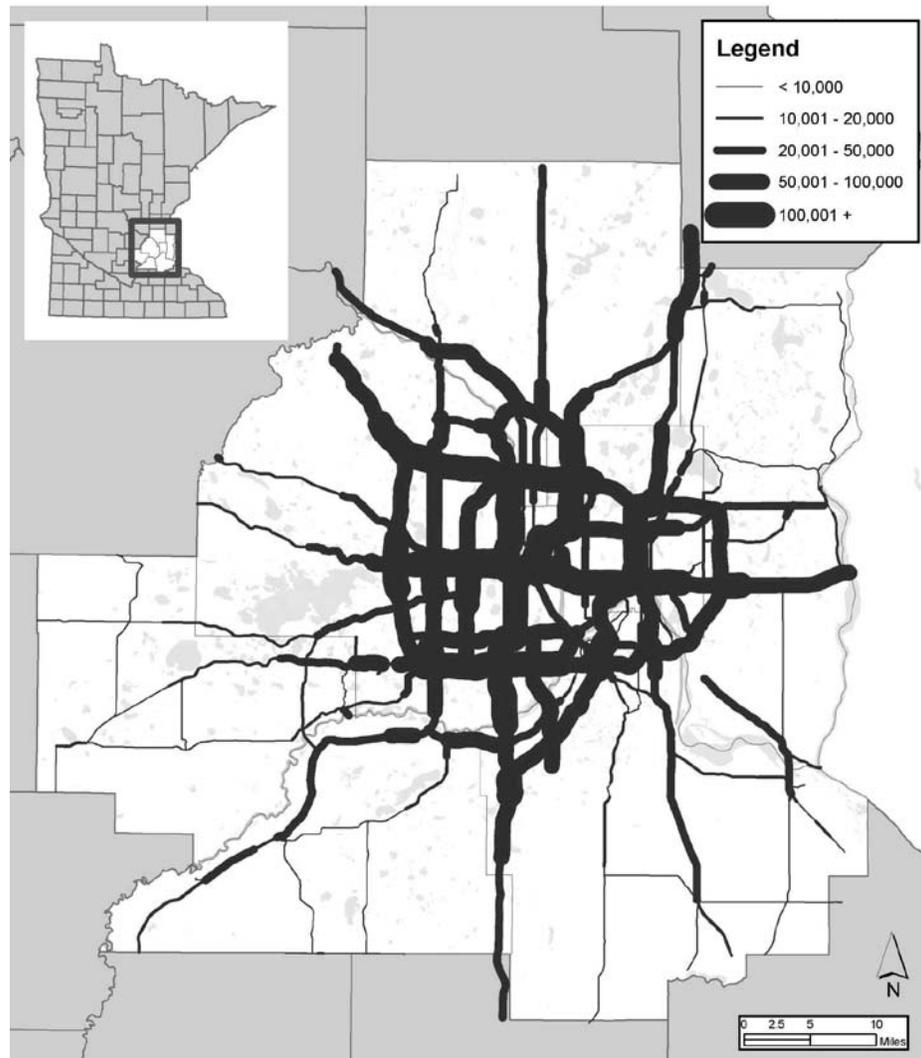
Source: Mn/DOT Office of Transportation Data and Analysis, 2007

Figures 3.2 and 3.3 illustrate how daily travel was distributed on the nearly 12,000 miles of state highways. In 2007, heavy commercial vehicle travel on state highways made up five percent of total vehicle miles traveled (VMT) on that system. From 2001 to 2007, VMT for all vehicles on the state highway system increased by three percent, as did heavy commercial VMT.



**Figure 3.2 Average Daily Traffic Volume, Greater Minnesota State Highways**

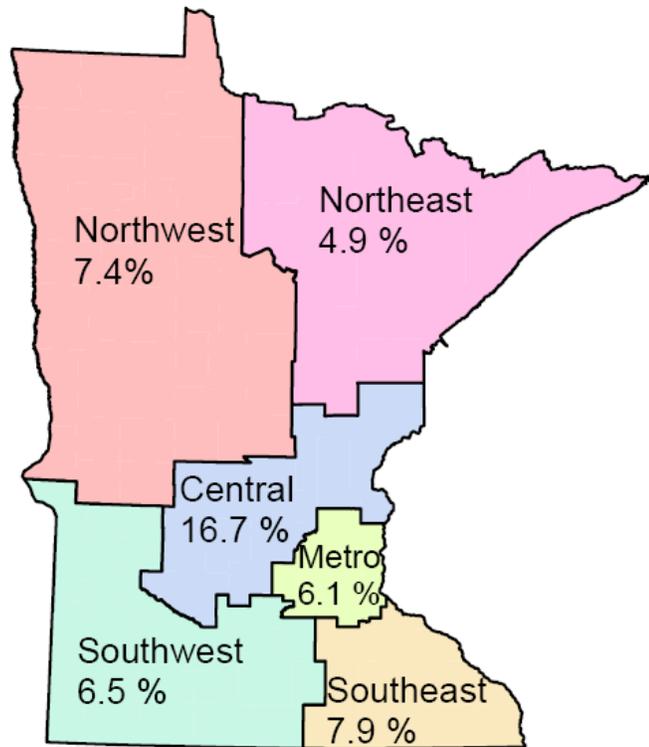
Source: Mn/DOT Office of Transportation Data and Analysis, 2006



**Figure 3.3 Average Daily Traffic Volume, Twin Cities Metropolitan Area State Highways**

Source: Mn/DOT Office of Transportation Data and Analysis, 2006

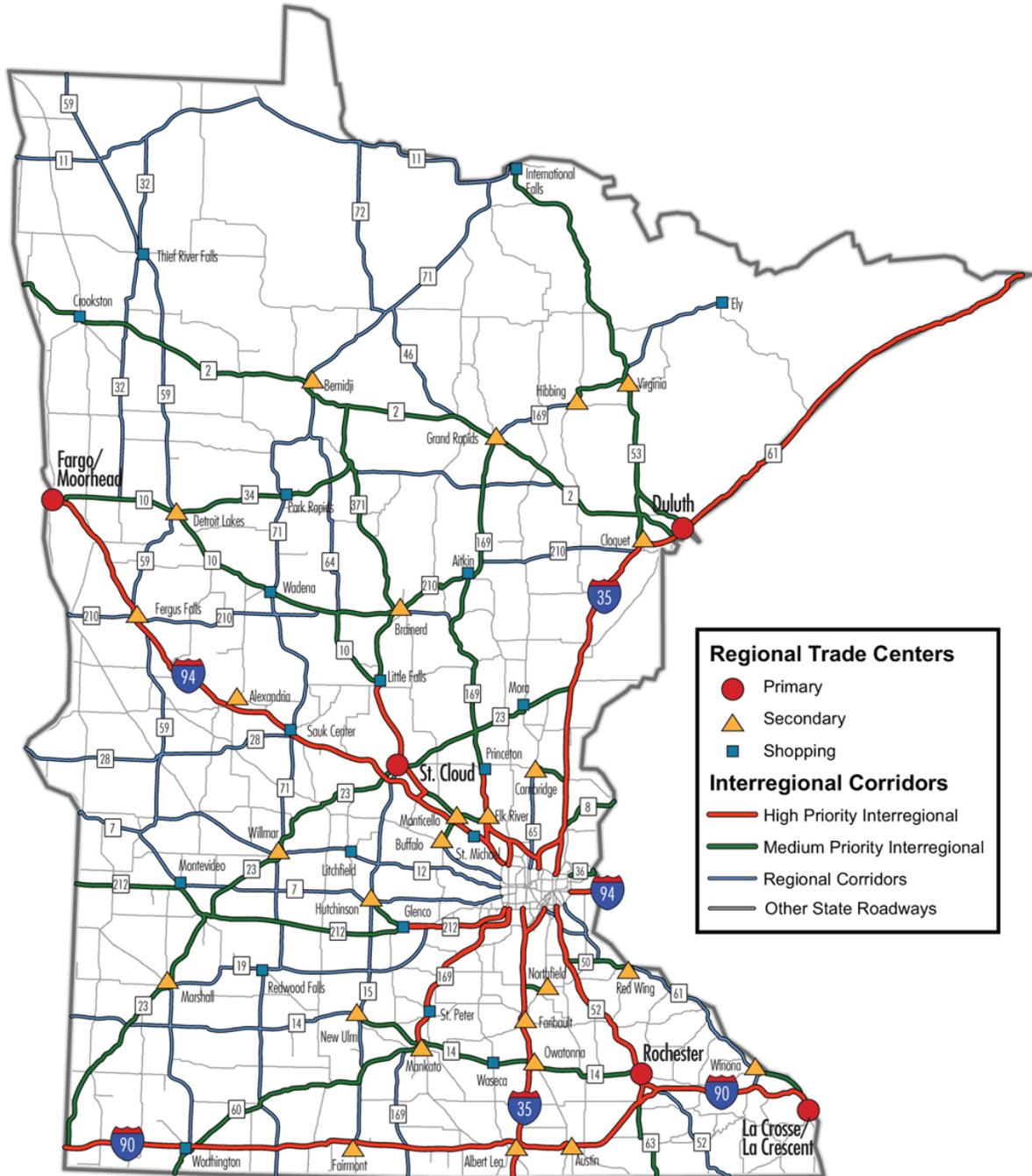
Figure 3.4 shows the percent change in VMT on all streets and highways by region for the period 2001 to 2007. Notable is the VMT increase in the Central Region of 16.7 percent, where correspondingly high levels of population and employment growth have increased demands on the transportation system.



**Figure 3.4 2001 to 2007 Percent Change in Vehicle Miles Traveled by Region**

Source: Mn/DOT Office of Transportation Data and Analysis

Figure 3.5 shows Minnesota's Interregional Corridor System and regional trade centers (RTCs). The goal of the Interregional Corridor System is to maintain safe, timely, and efficient transportation services between regional centers. (The Interregional Corridor designation terminates at the Twin Cities' I-494/694 Beltway.)



**Figure 3.5 Interregional and Regional Corridors and Regional Trade Centers**

Source: Mn/DOT Office of Investment Management

Regional trade centers (RTCs) were defined in a study conducted by the University of Minnesota Center for Urban and Regional Affairs (CURA). The study developed a model for ranking RTCs in an eight-level hierarchy that uses population and the number and diversity of businesses in an area to determine each ranking. Mn/DOT's Interregional Corridor System was developed to connect higher-order trade centers serving relatively large geographic areas. Mn/DOT defines RTCs as cities in levels 0 to 3 of the hierarchy. These communities provide specialized businesses and services to trade area markets beyond the immediate community.

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*The IRC System is approximately two percent of all roadway miles, but it accounts for 27 percent of all vehicle miles traveled.*

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The Interregional Corridor System shown in Figure 3.5 consists of high priority and medium priority corridors. These 2,938 miles comprise only two percent of all roadway miles in Minnesota, but carry approximately 27 percent of VMT. As such, they are critical to the economic vitality of the state. Figure 3.5 also shows Regional Corridors that provide connections between communities of regional significance and the Interregional Corridor System. Table 3.3 shows state highway mileage included in the Interregional Corridor and Regional Corridor Systems.

**Table 3.3 Interregional and Regional Corridor System Mileage**

Highway Type	Miles	Share of State Highways (%)
High-Priority Interregional Corridor	1,219	10
Medium-Priority Interregional Corridor	1,720	15
Regional Corridor	2,544	21
Other State Highways	6,400	54
<b>Total</b>	<b>11,883</b>	<b>100</b>

Source: Mn/DOT Office of Investment Management

## Multimodal Transportation

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*Other transportation modes meet specialized passenger and freight needs for heavy loads, time-sensitive transport, and long-distance national and international trips.*

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While the highway system described in the preceding section serves, to a large degree, private automobile users, roadways are also the primary transportation infrastructure support system for bus transit, motor carriers, and bicycles. In addition, roadways are the primary means of access to water ports, airports, and railroad transfer facilities and terminals. Other transportation modes meet specialized passenger and freight needs for heavy loads, time-sensitive transport, and long-distance national and international trips.

Highways are critical for ensuring continued access and mobility for travelers and for maintaining the state's economic vitality. However, the efficient and effective movement of people and goods requires a balanced transportation system offering a variety of transportation modes. For example, many commodities like grain and coal are most efficiently transported over long distances by rail or water, people who do not or cannot drive a car are dependent on transit options, and many commuters choose transit service to make their trips to work. The remainder of this chapter describes those and other transportation options, the markets they serve, and Mn/DOT's role in providing these services.

## Multimodal Transportation Defined

Modes are forms of transportation that move people and freight. Transport modes for people include automobiles/vans (single and multiple occupants), bus transit, passenger rail transit (light rail, commuter rail), air passenger service, bicycle, and walking. Freight modes include motor carriers, rail freight, water modes (ships and barges), air freight, and pipelines. When more than one mode of transportation is available for moving people or freight between multiple trip origins and destinations, this is referred to as a multimodal transportation system. When the movement of people or freight involves more than one mode for a given trip, this is referred to as intermodal transportation. Intermodal transportation involves transfers between different modes.

Transportation planning and policy-making have in the past focused on single transportation modes. In a multimodal transportation system, modes are provided and operated in a seamless system that is more efficient, flexible, and environmentally sustainable and meets the needs of travelers and shippers alike. A multimodal planning approach ensures that transportation alternatives are addressed concurrently and evaluated on the basis of overall needs and investment strategies. The multimodal approach also allows comparative environmental effects to be considered in the planning process.

A multimodal and intermodal approach offers the promise of lower overall transportation costs, increased economic productivity and efficiency, congestion reduction, improved mobility, reductions in energy consumption, and a more sustainable transportation system.

An extensive system of highways, railways, waterways, and airports supports people and goods movement within the state as well as to and from other states and countries. As global competition increases, maintaining the quality and capacity of this system is crucial to the economy of Minnesota. Improving the system to include transportation alternatives to passengers is equally important to ensure the mobility and quality of life Minnesota's citizens deserve and have come to expect.

## Modes Moving Freight

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*In 2001, more than 636 million tons of freight moved in and through Minnesota with a value of \$562 billion, an amount equivalent to 129 tons and \$114,000 per resident.*

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An efficient freight system is an essential component in enhancing Minnesota's economic competitiveness in the national and global marketplace. In 2001, more than 636 million tons of freight moved in and through Minnesota with a value of \$562 billion<sup>1</sup>, an amount equivalent to 129 tons and \$114,000 per resident. This is projected to grow to 1,329 million tons (109 percent increase) and \$1,238 billion value (120 percent increase) by 2035<sup>2</sup>. Freight movement is essential for Minnesota's 9,000 manufacturers, 28,000 retail stores, 15,000 wholesale trade companies, and 3,000 agricultural businesses. These industries together employ nearly 50 percent of the state's workers. Preserving and enhancing the freight system is critical to maintaining the high quality of life expected by Minnesotans.

Global competitiveness is a key factor in supporting Minnesota's current and future economic strength. Two-thirds of all freight tonnage moving in Minnesota crosses Minnesota's borders, including state imports, exports, and through

traffic. Minnesota exports to nearly 200 countries around the world. It is home to 19 Fortune 500 companies and 32 Fortune 1,000 companies. National and international companies, including Supervalu, CHS, General Mills, Land O'Lakes, Hormel Foods, Polaris Industries, and Toro are headquartered in the state. These businesses, as well as thousands of smaller businesses, need competitive access to raw materials and to markets for distributing products and providing services.

Freight, in the context of this plan, is defined as the transportation of commodities and/or cargo. These commodities and cargo may be raw or finished. In Minnesota, freight moves on an integrated network of roadways, railways, waterways, and air transport. This includes routine intermodal movements of freight between modes determined by the most efficient and cost-effective combinations. Table 3.4 summarizes the percent of freight in terms of weight and value moved in Minnesota by the aforementioned modes.

**Table 3.4 Freight Mode by Weight and Value, 2001**

Freight Mode	Weight (%)	Value (%)
Truck	59	79
Rail	33	14
Water	8	1
Air	<1	6

Source: Mn/DOT Office of Freight and Commercial Vehicle Operations

## Trucks

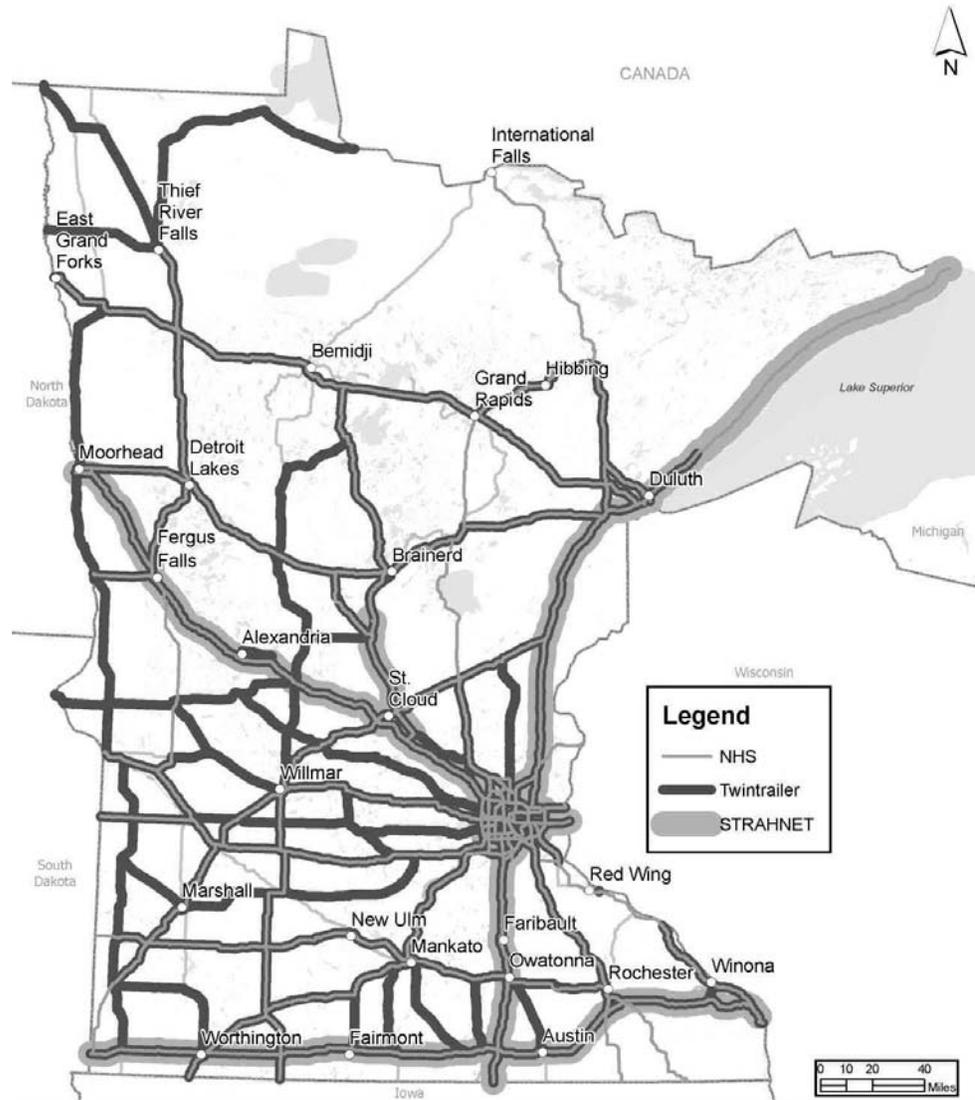
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*Trucks are an important mode for moving high-value goods both in Minnesota and nationally.*

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Trucks are an important mode for moving high-value goods both in Minnesota and nationally; trucks move more freight in Minnesota both in terms of weight and value than any other mode. Trucks account for 59 percent of freight movement by tonnage and 79 percent by value in the state. Their movement necessitates use of the full range of road networks, from local roads to federal highways. A description of these trucking networks in Minnesota follows.

The National Highway System (NHS) was developed by the United States Department of Transportation (USDOT) in cooperation with states, municipalities, and metropolitan planning organizations. The NHS includes interstate roadways, the Strategic Highway Network (STRAHNET), which is the system of public highways that provide access, continuity, and emergency transportation of military personnel and equipment. The NHS also includes some of the roadways designated as principal arterials, STRAHNET connectors, and intermodal connectors.<sup>3</sup> The NHS system in Minnesota is approximately 3,924 miles. Figure 3.6 identifies the NHS system.

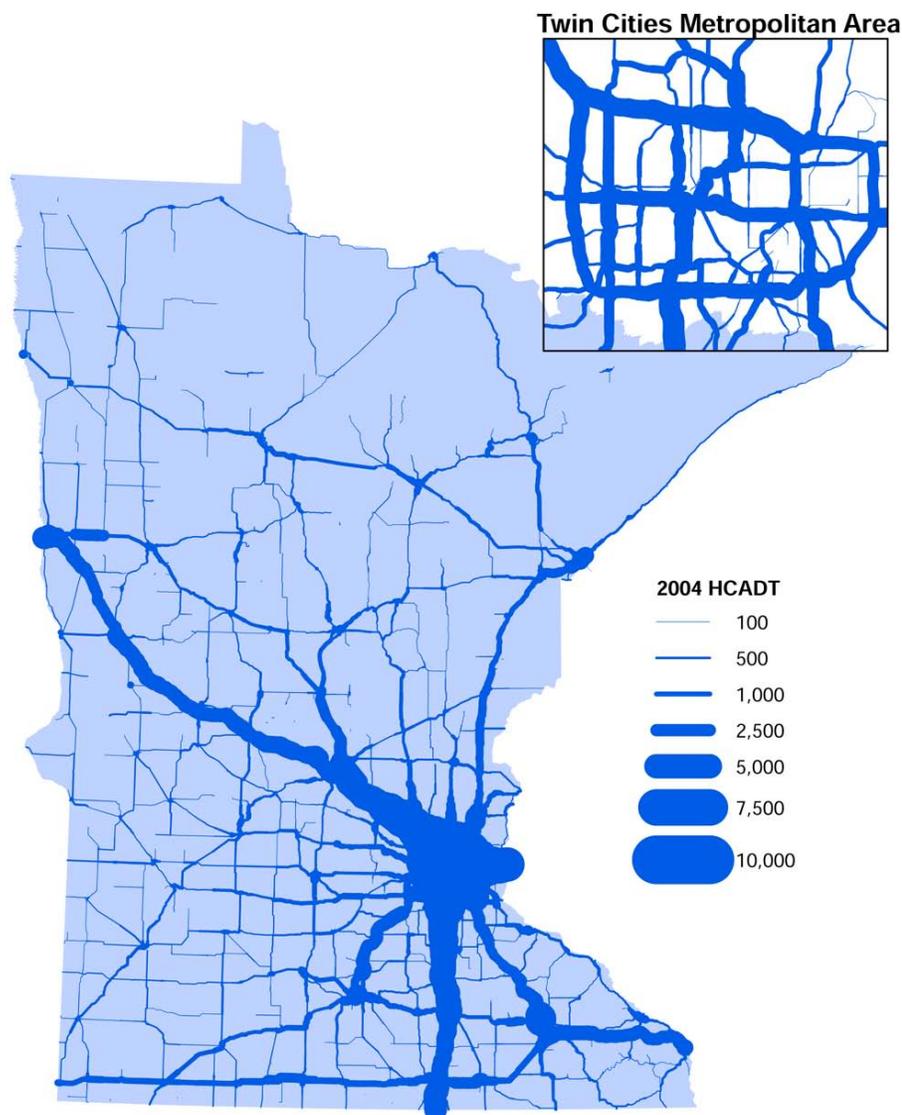


**Figure 3.6 Key Minnesota Truck Routes**

*Source: Mn/DOT Office of Freight and Commercial Vehicle Operations*

The National Truck Network (NTN) consists of a separately designated set of state and federal roadways throughout the U.S. that allows long-combination vehicles (LCVs), semi-trailer trucks with two trailers, and single-trailer trucks with an extra-long trailer. In Minnesota, 4,974 miles of roadway are part of the NTN. Minnesota’s Twin Trailer Network is a system composed of 1,741 miles of state highways and local highways on which LCVs may operate in addition to the NTN.

The Interregional Corridor System previously described is also important to trucking as it enhances the economic vitality of the state by providing safe, timely, and efficient movement of goods between major regional trade centers. Figure 3.7 illustrates average daily heavy commercial vehicle (truck) volumes on key Minnesota highways.



**Figure 3.7 Heavy Commercial Vehicle Average Daily Traffic Volumes (HCADT)**

Source: Mn/DOT Office of Transportation Data and Analysis, 2004

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*City and county routes that receive state aid funding generally connect freight generating/receiving facilities to the state and federal systems.*

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In addition to these federal- and state-designated routes, local system roadways play an important role in freight movement. City and county routes that receive state aid funding generally connect freight generating/receiving facilities to the state and federal systems. These roadways are often referred to as the “last mile” of the system.

There are several ancillary roadway facilities that ensure that freight is moving safely and efficiently across Minnesota. The Minnesota Department of Public Safety’s State Patrol Unit carries out enforcement of statutory size and weight limits at truck weigh and inspection stations. Additionally, the State Patrol operates portable scales and conducts inspections at non-fixed locations.

Other important ancillary freight facilities are safety rest areas that provide access and parking for commercial vehicles. An adequate system of safety rest areas is critical to highway safety. Due to the safety concerns identified by the

USDOT and other agencies, regulations and rules regarding driver hours of operation have been recently strengthened. The new regulations underscore the importance of having enough high-capacity truck rest areas for long-haul freight carriers.

Mn/DOT, in partnership with local agencies, performs an ongoing role in freight planning, safety, and system improvements, including programs like Minnesota Rail Service Improvement, Rail Grade Crossing Improvement Program, Operation Lifesaver, and the Port Development Assistance program.

### **Rail Freight**



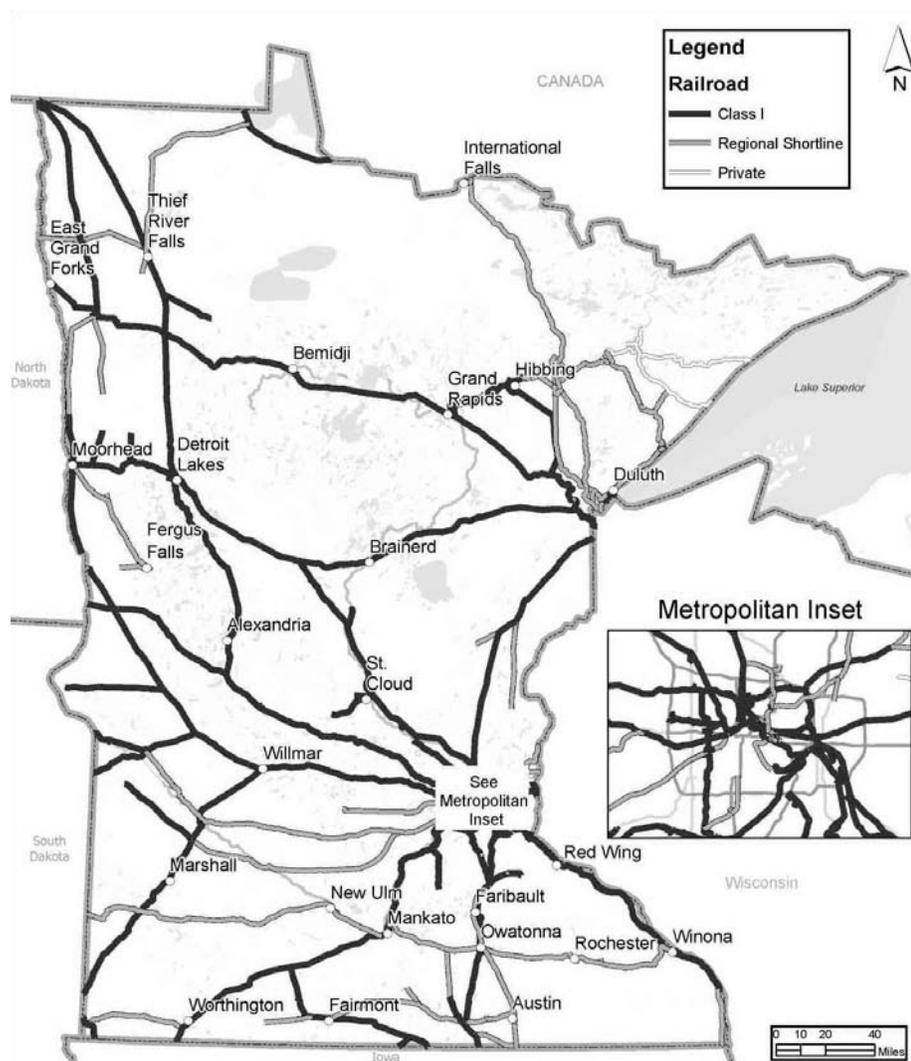
Minnesota's rail network is important for moving heavy bulk goods and a variety of commodities that amount to 33 percent of freight tonnage and 14 percent of freight value in Minnesota. Twenty-three railroad companies and three private industries haul rail freight in Minnesota on approximately 4,496 miles of track. The rail companies are divided into three classes, based on operating revenues and status as defined by the federal Surface Transportation Board. Figure 3.8 identifies Minnesota's existing rail network.

Class I railroads, the largest long-haul carriers, have annual gross operating revenue exceeding \$346.8 million. The Class I companies operate 3,246 miles of rail lines in Minnesota and include:

- Burlington Northern Santa Fe Railway (1,598 miles)
- Canadian National Railway (436 miles)
- Canadian Pacific Railway (750 miles)
- Union Pacific Railroad (462 miles)

Class II railroads, also referred to as regional railroads, have annual gross operating revenue between \$27.8 million and \$346.7 million. Minnesota has one Class II railroad, the Dakota Minnesota and Eastern (DM & E), operating 472 miles of rail lines. The DM & E has been recently purchased by the Canadian Pacific Railway.

Class III railroads, also referred to as shortline or local railroads, have annual gross operating revenue of less than \$27.8 million. There are currently 14 Class III railroads operating approximately 763 miles of rail lines in Minnesota.



**Figure 3.8 Existing Railroad Network**

Source: Mn/DOT Office of Freight and Commercial Vehicle Operations

### Ports and Waterways

*The waterway system provides an effective means for transporting bulk products over long distances.*

Minnesota is served by two waterway systems: the Mississippi River and the Great Lakes/St. Lawrence Seaway. These bodies of water provide a low-cost and effective means of transporting bulk products over long distances that account for eight percent freight tonnage and one percent of freight value in Minnesota.

The Mississippi River system, which also includes 23 navigable miles of the St. Croix River and 14.7 navigable miles of the Minnesota River, connects Minnesota with 17 states and the international port of New Orleans. Within Minnesota, the system is 222 miles long and encompasses five ports (i.e., Savage, Minneapolis, Saint Paul, Red Wing, and Winona) and a series of 11 locks and dams. These ports handled a total of 13 million tons in 2006. The U.S. Army Corps of Engineers is responsible for maintaining a navigation

channel to accommodate a nine-foot draft, and operates all locks and dams on the Mississippi River system from Minneapolis to St. Louis, Missouri.<sup>4</sup> Local authorities and private companies provide port operations.

Barge tows and diesel towboats are used to haul freight up and down the Mississippi River between the Twin Cities and New Orleans.<sup>5</sup> They haul a wide range of bulk commodities, ranging from grain, coal, fertilizer, and other dry bulk goods to liquid chemicals and petroleum products. The Mississippi River system in Minnesota remains in operation for approximately eight months of the year, from the middle of March through November when it closes in anticipation of ice.

Minnesota has four ports on Lake Superior as part of the Great Lakes and St. Lawrence Seaway System (i.e., Duluth, Two Harbors, Silver Bay, and Taconite Harbor). These ports handled a total of 67 million tons of freight in 2006. The taconite industry in Minnesota accounts for 80 percent of the iron ore used in the U.S. and represents a major portion of Great Lakes. Other major commodities include grain, coal, limestone, and aggregate. Great Lakes cargo is moved by a combination of dedicated bulk freighters known as “lakers,” often up to 1,000 feet long. “Salties” are a smaller class of oceangoing vessels that can travel the St. Lawrence Seaway to the ocean. The U.S. Army Corps of Engineers and the Canadian government operate the locks on the Great Lakes/St. Lawrence Seaway system and maintain a 29-foot-deep navigational channel.<sup>6</sup>

### **Air Freight**

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*Airports in Minnesota provide a direct link to economic hubs and metropolitan areas throughout the U.S. and the world.*

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Airports in Minnesota provide a direct link to economic hubs and metropolitan areas throughout the U.S. and the world. The aviation system in Minnesota is the preferred mode for moving high-value or time-sensitive goods over long distances, including links to international destinations. Air transports make up about one percent of Minnesota’s freight by tonnage and six percent by value. Because more frequent and comprehensive air freight service is available in Chicago, air cargo is often shipped there via truck and then transhipped to aircraft.

There are 14 airports in Minnesota that support scheduled air cargo operations. An additional 18 airports provide on-demand charter operations for air cargo. The Minneapolis-Saint Paul International (MSP), Duluth International, and Rochester International Airports are major air-freight hubs offering dedicated freight and express service as well as freight carriage via commercial passenger aircraft. Over 91 percent of the air cargo moving into and out of the state goes through MSP, with Duluth and Rochester accounting for an additional seven percent. The remaining two percent moves through Minnesota’s other air cargo terminals.<sup>7</sup>

### **Mn/DOT'S Role in Moving Freight**

Mn/DOT is directly charged with constructing, operating, maintaining, and managing the state highway system. In contrast, private businesses are directly charged with moving freight in Minnesota and Mn/DOT provides support through its Office of Freight and Commercial Vehicle Operations and Office of Aeronautics.

The Mn/DOT Office of Freight and Commercial Vehicle Operations provides a number of services, including:

- Develop statewide freight, railroad, and waterway plans that guide investment and policy decisions and impact the freight carriers.
- Provide support in delivering infrastructure improvements.
- Develop agreements.
- Provide loans or grants to public port authorities, regional railroad authorities, railroads, and shippers.
- Represent the state's interest in the movement of freight by railroads, administers highway/railroad construction projects, and manages investment in rail service improvements.
- Participate in the development of freight-related data sources and tools to facilitate greater incorporation of freight issues and needs into statewide, modal, and district plans.
- Administer commercial vehicle licensing and safety regulations, including property carriers, passenger carriers, hazardous materials, and oversize/overweight permits.

Mn/DOT's Office of Aeronautics promotes general and commercial aviation throughout the state consistent with federal aviation authorization legislation as well as state legislation and goals. Several of its services include:

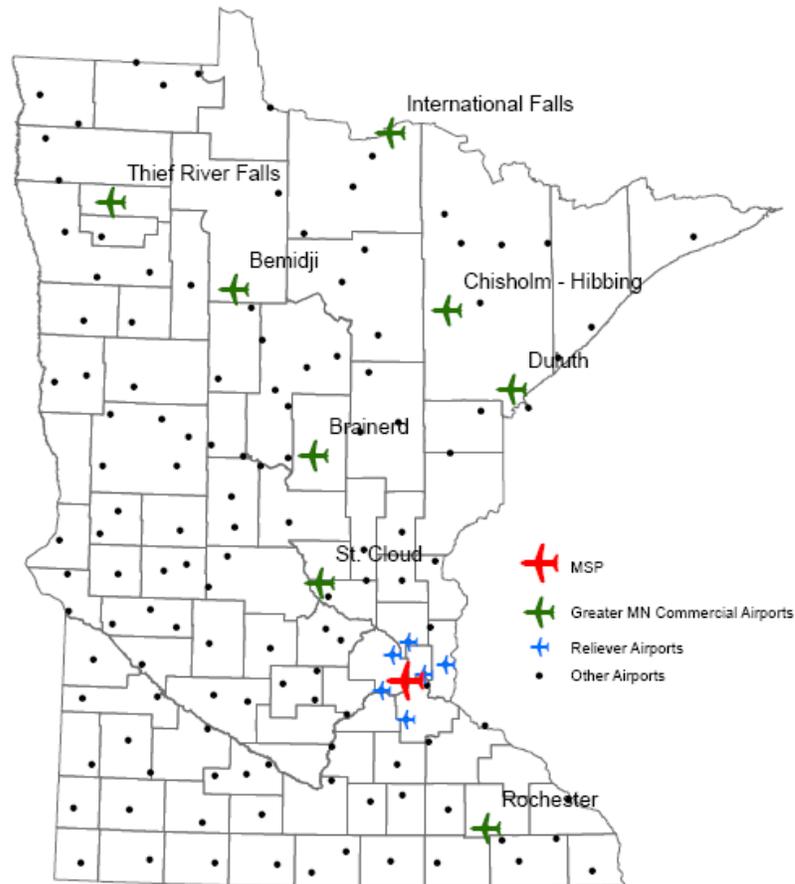
- Airport development — providing technical and financial assistance to municipalities for the development and maintenance of existing and planned airports.
- Aviation education — forming liaisons with industry, government, and education institutions to identify and meet education and training needs.
- Navigational system — establishing, operating, and maintaining electronic navigation aids to augment the federal system in Minnesota.
- Planning, research, and information regarding statewide and regional strategic, system, intermodal, and master planning for aviation; develop forecasts of aviation activity and revenue needs; assist airport owners in meeting federal and state environmental requirements; and monitor aviation issues and legislation.
- Air transportation in Mn/DOT-owned aircraft for Mn/DOT and other state employees, the Legislature, and constitutional officers when conducting official business.
- Other functions include airport licensing, aircraft registration, and safety training.

## Modes Moving People

In addition to the highway system and private vehicles, the air, rail, bus, and bicycle-pedestrian systems in Minnesota move millions of people each year to jobs, shopping, and recreational areas. These systems are a mix of both public and private infrastructure and are critical in supporting Minnesota's economy.

### Passenger Aviation and Airports

There are 136 public general aviation and commercial airports in Minnesota. Of those, 127 are part of the Greater Minnesota airport system while nine are located in the Twin Cities Metropolitan Area (TCMA), including MSP and eight general aviation airports. Figure 3.9 highlights the location of all of Minnesota's public general aviation and commercial airports.



**Figure 3.9 Minnesota Public General Aviation and Commercial Airports**

Source: Mn/DOT Office of Investment Management

### Greater Minnesota Passenger Aviation

While MSP handles the majority of annual enplanements (the number of passengers departing from an airport) in the state, airports throughout Greater Minnesota serve a crucial role in connecting regional trade centers. Each of the 127 airports in the Greater Minnesota system is classified in one of three ways described below. The classifications are an important way to help manage and plan Minnesota's airport system.

*Key Airports* are distinguished by paved and lighted primary runways 5,000 feet or greater in length. They are capable of accommodating all single engine aircraft along with larger multiengine aircraft and most corporate jets. There are 24 Key Airports in Greater Minnesota.

*Intermediate Airports* are characterized by paved and lighted primary runways that are less than 5,000 feet long. They can accommodate all single-engine aircraft, some multiengine aircraft, and some corporate jets. There are 80 Intermediate Airports in Greater Minnesota.

*Landing Strips* have turf runways that can accommodate most single-engine aircraft and some twin-engine aircraft. They may be unusable during wet weather, winter months, and the spring melt. There are 23 Landing Strips in Greater Minnesota.

In 2006, Mn/DOT's Office of Aeronautics completed the current version of the Minnesota Aviation System Plan. The plan acknowledges that the airline industry and business is fluid in nature; however, it is still important to have an estimate of how and where growth will occur in the future. The plan includes demand projections through 2025 for passengers boarding commercial airlines (enplanements) and for commercial airline operations. Many factors were considered in developing these projections including national trends in both commercial and general aviation, continued impact of low cost carriers, and bankruptcies. There are eight commercial airports in Greater Minnesota. Table 3.5 presents enplanement forecasts.

**Table 3.5 Greater Minnesota Commercial Enplanement Forecasts**

Airports	1995	2005	2010	2015	2020	2025	Growth (1995 to 2025)	
							(Number)	(%)
Bemidji	16,100	29,900	33,900	38,500	43,400	48,000	31,900	198
International Falls	19,100	21,800	21,700	21,800	21,800	21,900	2,800	15
Brainerd Lakes	11,800	20,700	22,000	22,800	22,900	23,000	11,200	95
Rochester	156,500	143,200	153,600	159,300	165,500	171,400	14,900	10
Chisholm-Hibbing	13,100	11,600	11,700	11,700	11,700	11,700	-1,400	-11
St. Cloud	8,400	25,900	25,600	27,100	29,100	31,100	22,700	270
Duluth	119,200	155,800	182,500	201,300	216,000	226,200	107,000	90
Thief River Falls	3,700	5,000	5,000	5,000	5,000	5,000	1,300	35

Source: Mn/DOT Office of Aeronautics

Key areas of projected growth include Bemidji, Brainerd Lakes, St. Cloud, and Duluth. Passenger enplanements at Greater Minnesota commercial airports from 1995 to 2025 were/are projected to increase by 50 percent, from 348,000 to 538,300, respectively. Their share of statewide commercial enplanements, however, is expected to decline as a greater percentage of air travelers drive to MSP to begin their airline trip.

Mn/DOT is responsible for the registration of all general aviation aircraft in Minnesota. This registration process revealed that 6,458 general aviation aircraft

were registered by Minnesota owners in 2005. Roughly 40 percent of these planes are reportedly based at Greater Minnesota airports.

Future growth in general aviation demand at airports in Greater Minnesota is expected to mirror actual growth that occurred between 1995 and 2005. The 2006 Minnesota Aviation System Plan's general aviation demand projections indicate that most Greater Minnesota airports should have ample operational capacity to accommodate projected demand. However, most airports will need additional aircraft storage capacity to meet growing demand from based aircraft.

### **TCMA Passenger Aviation**

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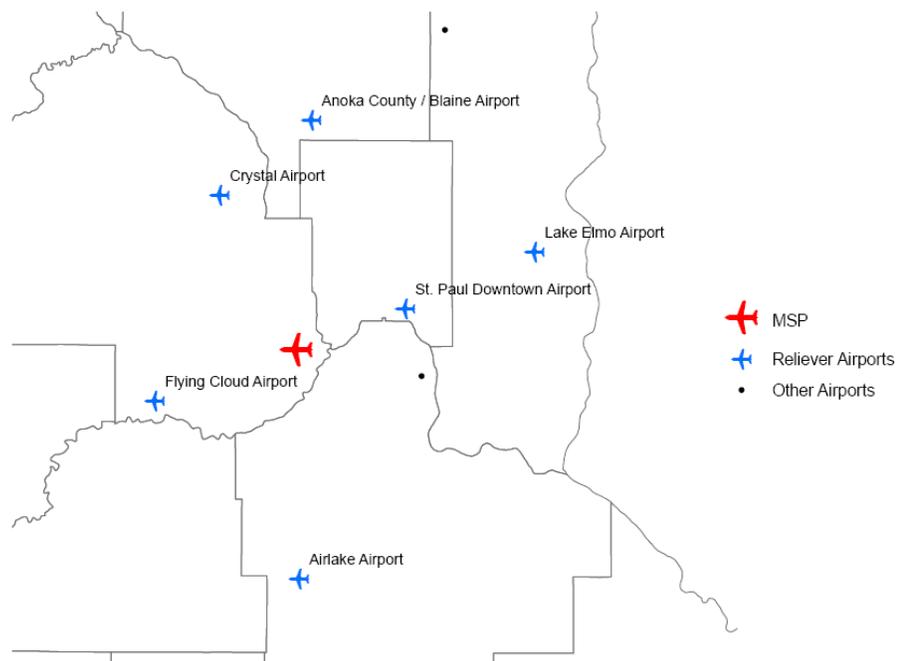
*In 2007, MSP was the nation's 14th busiest airport in terms of number of passengers served.*

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MSP and six reliever airports, identified in Figure 3.10, are owned and operated by the Metropolitan Airports Commission (MAC), a public corporation created by state law in 1943 to coordinate aviation services throughout the TCMA. The MAC's mission is to serve the community by ensuring the safety of airport users and to provide efficient services and facilities for air travelers. In this role, the MAC has been a fundamental contributor in making the Twin Cities region a strong force in the global economy.

MSP was the 14th busiest airport in the U.S. in 2007 in terms of number of passengers served.<sup>8</sup> It has two passenger terminals, Lindbergh and Humphrey, comprising 2.4 million square feet. The Humphrey Terminal has considerably fewer terminals compared to the Lindbergh Terminal, with 10 and 117, respectively. MSP's airfield has four runways: two running parallel, one running north-south, and one crosswind runway. They are between 8,000 and approximately 11,000 feet in length. The airfield also supports FedEx and UPS cargo facilities. Both terminals are accessible by public transportation (light rail transit and bus) as well as personal and for-hire automobiles. MSP has served as a major hub for Northwest Airlines.

In terms of total annual passengers between 1990 and 2007, MSP experienced an increase of more than 14.9 million for a total of 34.1 million total revenue passengers in 2007. The airline industry remains unpredictable across the globe, and MSP is not insulated from the resulting challenges. As the major hub for Northwest Airlines, in many ways as that airline goes so does MSP. Some recent challenges include a 2005 mechanics strike followed by a bankruptcy filing in the same year. The airline emerged from bankruptcy in 2007 and completed a merger with Delta Airlines resulting in the world's largest airline in 2008.



**Figure 3.10 MSP and Reliever Airports**

Source: Mn/DOT Office of Investment Management

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*More than half of all registered aircraft in Minnesota are based at reliever airports.*

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The Twin Cities' six reliever airports, also operated by MAC, comprise one of the largest reliever airport systems in the nation. Nearly 830,000 takeoffs and landings a year occur at the six reliever airports — nearly 300,000 more than at MSP. The airports are strategically positioned throughout the region to address special aviation needs, such as flight training, military operations, and medical evacuations. More than half of all registered aircraft in Minnesota are based at reliever airports, which generate an estimated \$1.4 billion annually for the economy of the TCMA.

### Passenger Rail

Minnesota's multimodal transportation system provides choices for Minnesota rail travelers including intercity rail service, light rail transit (LRT), and, by the end of 2009, commuter rail services.

In the right circumstance, passenger rail can provide cost-effective transportation services for travelers. After a rail line is in place, the addition of capacity to commuter, LRT, or intercity rail can generally be accomplished by adding passenger cars to existing trains. Additional train frequencies also add capacity, enabling more passengers to travel with greater flexibility. Passenger rail projects offer the additional benefits of reduced emissions, reduced parking demand in central business districts, and improved accessibility for those who cannot drive and often encourage new development oriented toward new transit facilities.

Passenger rail continues to evolve as a transportation mode in Minnesota. A brief description of existing and planned passenger rail efforts follows.

### **Light Rail Transit (LRT)**

LRT is generally defined as electric rail cars that operate in short trains. Powered from an overhead wire, LRT can run on exclusive, semi-exclusive, or shared alignments with or without grade crossings or even in traffic lanes on city streets. In the U.S., stations typically are 0.5 to 1.5 miles apart and rail service often operates nearly 24 hours a day. LRT corridors are usually 10 to 20 miles long.



*The Hiawatha LRT opened in 2004 and has consistently exceeded expectations.*

#### *Hiawatha LRT*

In 2004, Minnesota opened its first LRT line traveling along the Hiawatha Avenue Corridor. The 12-mile LRT line connects downtown Minneapolis, MSP Airport, and the Mall of America in Bloomington with a travel time of 36 minutes. The Hiawatha LRT opened in two stages: (1) revenue service from Minneapolis's Warehouse District to Fort Snelling began in June of 2004 and (2) service to the MSP Airport and the Mall of America commencing December of 2004.

Ridership has consistently exceeded expectations and the projections prior to operation. The line, which currently operates 27 light-rail vehicles, cost approximately \$715 million to build with funds coming from multiple sources.

#### *Central Corridor LRT*

Minnesota's second LRT line, scheduled to begin operations in 2014, uses the Central Corridor. The corridor spans 11 miles and links the downtowns of Minneapolis and Saint Paul with a projected travel time of just over 39 minutes for the length of the line. Additional major activity centers along this line include the University of Minnesota, Saint Paul's Midway Area, and the State Capitol Complex. The Central Corridor line will connect with the existing Hiawatha line at the Metrodome station and will terminate at the planned multimodal station located at the western edge of downtown Minneapolis. The line will share five stations with the Hiawatha line, use 15 new stations, and have infrastructure constructed for three future stations. Projections indicate weekday ridership at 38,000 by 2020 and 44,000 by 2030.

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*The Central Corridor LRT is scheduled to begin operation in 2014.*

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#### *Southwest Transitway LRT*

The Southwest Transitway is being considered for Minnesota's third LRT line. Though multiple routes for the line are still under consideration, it would connect the residents and workers of the southwest metropolitan communities, including Eden Prairie, Minnetonka, Edina, and Hopkins, with downtown Minneapolis. This line would also connect with the Hiawatha and Central Corridors in downtown Minneapolis. Ridership projections are currently between 23,500 and 28,100 per day by 2030. This ridership is comparable to the Hiawatha line's current ridership. The Southwest Transitway is currently in the Draft Environmental Impact Statement (DEIS) phase, which should be complete in 2009.



*The Northstar Commuter Rail Line is scheduled to begin operations in late 2009.*

## **Commuter Rail**

Commuter rail passenger service is generally defined as passenger train service that operates on existing freight railroad tracks. Commuter rail service primarily operates during "peak" travel times, usually the hours of 6:00 to 9:00 A.M. and again from 3:00 to 6:00 P.M. Trains run inbound to the city center in the morning and run outbound service to suburban areas in the evening.

In 1997, the Minnesota Legislature instructed Mn/DOT to conduct a feasibility study to determine if the TCMA could support commuter rail service. As a result, in January 1999, Mn/DOT presented to the legislature the Twin Cities Metropolitan Commuter Rail Feasibility Study. Subsequently, the Commuter Rail System Plan was published in February of 2000 and became a prescriptive tool to ensure commuter rail development would be accomplished in a cooperative and consistent manner that provides, to the maximum extent possible, coordination amongst stakeholders.

### *Northstar Commuter Rail Line*

The Northstar Commuter Rail Line is on schedule to begin operation in late 2009. The rail line runs for 40 miles on existing track owned by Burlington Northern Santa Fe (BNSF) Railway between Big Lake and downtown Minneapolis. There are currently five stations under construction including Big Lake, Elk River, Anoka, Coon Rapids Riverdale, and downtown Minneapolis. When in operation, the trains will reach a top speed of 79 miles per hour and will make the trip between Big Lake and Minneapolis in an estimated 41 minutes. The train will make five trips in the direction of the morning and evening commute, with one reverse trip during each peak travel period as well. Limited weekend service will also be available. There will be an estimated 4,110 daily riders in 2010 and 5,900 by 2030.

### *Red Rock Corridor*

The Red Rock Corridor is being considered as a potential expansion of commuter rail service in the Twin Cities. The envisioned line would run on a 30-mile corridor from Hastings to downtown Minneapolis, through downtown Saint Paul along Trunk Highways 10 and 61.

## **Intercity Rail and High-Speed Rail**

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*There is a renewed interest in passenger rail as an alternate means of transport.*

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There exists in the U.S. a renewed interest in passenger rail as an alternate means of transport over significant distances. Minnesota shares in this interest, and there are a number of efforts underway to enhance the existing passenger rail service and/or explore high-speed rail as an option for future investment. High-speed rail is a generic name for a family of technologies, both steel-wheel on rail and magnetic levitation (maglev) systems involving trains traveling at top speeds of 90 to 300 miles per hour for steel-wheel and maglev, respectively. Following is a summary of Minnesota's existing rail service and some of the efforts underway to expand the network. The upcoming Statewide Freight and Passenger Rail Plan will address the future of intercity and high-speed rail efforts in the state.

### *Amtrak Service*

Minnesota is a recipient of Amtrak service with the Empire Builder, a long-distance train from Seattle/Portland to Chicago. Stations in Minnesota include Detroit Lakes, Staples, St. Cloud, Minneapolis/Saint Paul, Red Wing, and Winona. Currently, one train serves these cities going eastbound and a second train travels westbound daily.

### *Midwest Regional Rail Initiative*

The Midwest Regional Rail Initiative (MWRRI), which is supported by nine Midwest states (i.e., Indiana, Illinois, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin), Amtrak, and the Federal Railroad Administration, is an effort to develop a 3,000-mile regional passenger rail system. This study includes the 400-mile corridor from the Twin Cities to Chicago. The Minnesota portion of the study includes 150 miles in southeastern Minnesota from La Crescent to Saint Paul that could accommodate high-speed trains. The MWRRI plan could mean the addition of up to six trains daily to Chicago with a reduction of rail travel time from eight and a half hours to five hours when the system is implemented.

In support of the MWRRI's overall objective to develop a regional passenger rail system, several specific corridors have been identified and studied. For example, the Tri-State High Speed Rail Feasibility Study focused on connecting the Twin Cities and Chicago via Milwaukee.

### *Northern Lights Express*

Another high-speed passenger rail corridor under consideration connects Duluth and the Twin Cities. The Federal Railroad Administration awarded this service, known as the Northern Lights Express, a \$1.1 million grant to complete an Environmental Impact Statement for the project.

### *Rochester Rail Link*

The Rochester Rail Link is another rail line under consideration and would connect the MSP Airport with the Rochester International Airport. The envisioned high-speed rail line would be capable of moving passengers and cargo. This corridor was the subject of a feasibility study that was conducted in 2003, which concluded that "the development of the high-speed rail link will help Rochester and the Twin Cities meet the transportation challenges of the 21st century. This should ensure that both the prosperity and the long-term economic growth of the region are achieved."

## **Bus Service**

Many people and communities throughout the state depend on bus transit services to meet their mobility needs. Public transportation can provide an efficient, cost-effective alternative for individuals in metropolitan areas, suburbs, small towns, and rural communities alike. As the population and demographics in Minnesota continue to change, the need for transit services becomes an even more important link for individuals traveling to work, school, medical appointments, and social activities.

*Regional fixed-route bus services provide almost 89 percent of all passenger trips made on the regional transit system.*

### TCMA Bus Service

Regional fixed-route bus services provide almost 89 percent of all passenger trips made on the regional transit system. The Metropolitan Council is responsible for distributing state and federal transit assistance funds to public transit systems within the TCMA. They are also responsible for the majority of transit planning and operations for the Twin Cities.

Several public transit systems serve the TCMA including Metro Transit, Metro-Mobility, suburban providers, small urban and rural systems, and private operators. These systems provide fixed-route and demand response services. In 2007, metropolitan bus transit systems carried nearly 80 million passengers. Table 3.6 displays the ridership experienced by all Twin Cities transit providers from transit providers from 2003 to 2007 as well as the associated growth rates.

**Table 3.6 TCMA Public Transit System Ridership from 2003 to 2007**

Provider	2003	2004*	2005	2006	2007	2003 to 2007 Growth	
						(Number)	(%)
Suburban Providers	3,429,684	3,574,212	3,953,219	4,377,498	4,786,315	1,356,631	40
Dial-a-Ride	502,185	492,562	499,168	496,410	491,047	-11,138	-2
Contracted Routes	1,910,737	1,719,068	2,048,901	2,438,660	2,293,765	383,028	20
VanGo Vanpools	103,120	130,693	131,192	157,523	176,288	73,168	71
Metro Mobility/ADA	1,289,906	1,334,777	1,276,429	1,287,056	1,363,743	73,837	6
Metropolitan Transportation Services Subtotal	7,235,632	7,251,312	7,908,909	8,757,147	9,111,158	1,875,526	26
Metro Transit LRT	0	2,938,777	7,901,668	8,957,912	9,101,036	9,101,036	-
Metro Transit Bus	65,955,804	53,224,192	60,933,016	63,517,250	67,270,136	1,314,332	2
Metro Transit Subtotal	65,955,804	56,162,969	68,834,684	72,475,162	76,371,172	10,415,368	16
Met Council Total	73,191,436	63,414,281	76,743,593	81,232,309	85,482,330	12,290,894	17
Northstar/Ramsey Star***	144,277	174,237	180,235	181,924	188,008	43,731	30
U of MN**	0	3,582,992	3,801,495	3,687,649	3,273,100	3,273,100	-
<b>Regional Total</b>	<b>73,335,713</b>	<b>67,171,510</b>	<b>80,725,323</b>	<b>85,101,882</b>	<b>88,943,438</b>	<b>15,607,725</b>	<b>21</b>

Notes:

\* Metro Transit operations were suspended for 41 days in 2004 due to a strike. LRT operation began June 26, 2004.

\*\* The University of Minnesota began reporting its regional ridership in 2004 but had been providing service prior to this date.

\*\*\* Ramsey Star operations began in 2007.

Source: Metropolitan Council 2030 Transportation Policy Plan

As evidenced by Table 3.6, transit use in the TCMA has increased over the five-year period from 2003 to 2007 by 21 percent. The Metropolitan Council's 2030 Transportation Policy Plan lays out the future direction for transit in the TCMA and supports the goal of doubling 2004 ridership numbers by 2030. According to the plan, the Twin Cities transit system has 218 regular routes that are

complemented by a dial-a-ride system covering most of the seven-county area. The system is served by 1,250 regular route buses and 460 dial-a-ride buses. Bus transit amenities in the region include 141 park-and-rides and 27 transit centers and stations.

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*Two new BRT routes are being planned on I-35 and Cedar Avenue.*

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#### *Bus Rapid Transit*

Several plans are currently underway to further develop and diversify the Twin Cities' transit system through bus rapid transit (BRT). Two BRT lines, using portions of I-35W and Cedar Avenue, south of Minneapolis, have begun construction due in large part to an Urban Partnership Agreement (UPA) grant recently secured by Minnesota. BRT uses buses as the vehicles but takes on several premium characteristics of rail transit, such as frequency, dedicated running ways, and similar vehicle technology, with the goal of greater efficiency and schedule adherence, among other benefits. Because BRT uses rubber-wheeled vehicles rather than vehicles that ride on rails, it is considerably more flexible and demand-responsive than LRT or commuter rail.

The Metropolitan Council's 2030 Transit Master Study identified several additional arterial corridors with future BRT potential. The Metropolitan Council's 2030 Transportation Policy Plan recommends their study and that nine new arterial bus rapid transitways be implemented by 2030.

#### *Commuter Coach*

Commuter coach services are designed to offer individuals traveling from outer ring suburbs and Greater Minnesota the opportunity to use express bus service to their destination in the Twin Cities downtown centers.

The first Mn/DOT-sponsored commuter coach service was the Northstar Commuter Coach, which began service in October 2001 between Elk River and downtown Minneapolis. The service provides eight trips to and from downtown Minneapolis during peak hours, picking up and dropping off at park-and-ride lots in Elk River and Coon Rapids.

The Ramsey Star is the newest commuter coach service to begin operation in the Twin Cities region. This operation provides regular-route coach bus service between the City of Ramsey and the 5th Street Transit Station in downtown Minneapolis. The coach buses run four inbound and four outbound trips each weekday.

#### **Greater Minnesota Bus Service**

Public transportation in Greater Minnesota has changed significantly over the years. New transit systems are continually being added while others are being contracted. Improvements in transit systems, including expanding existing public transportation networks, have given passengers additional access to transit services by improving routes and route schedules and by adding more destinations.

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*As of 2005, a total of 73 counties in Greater Minnesota have some level of public transit with 66 public transit systems in operation.*

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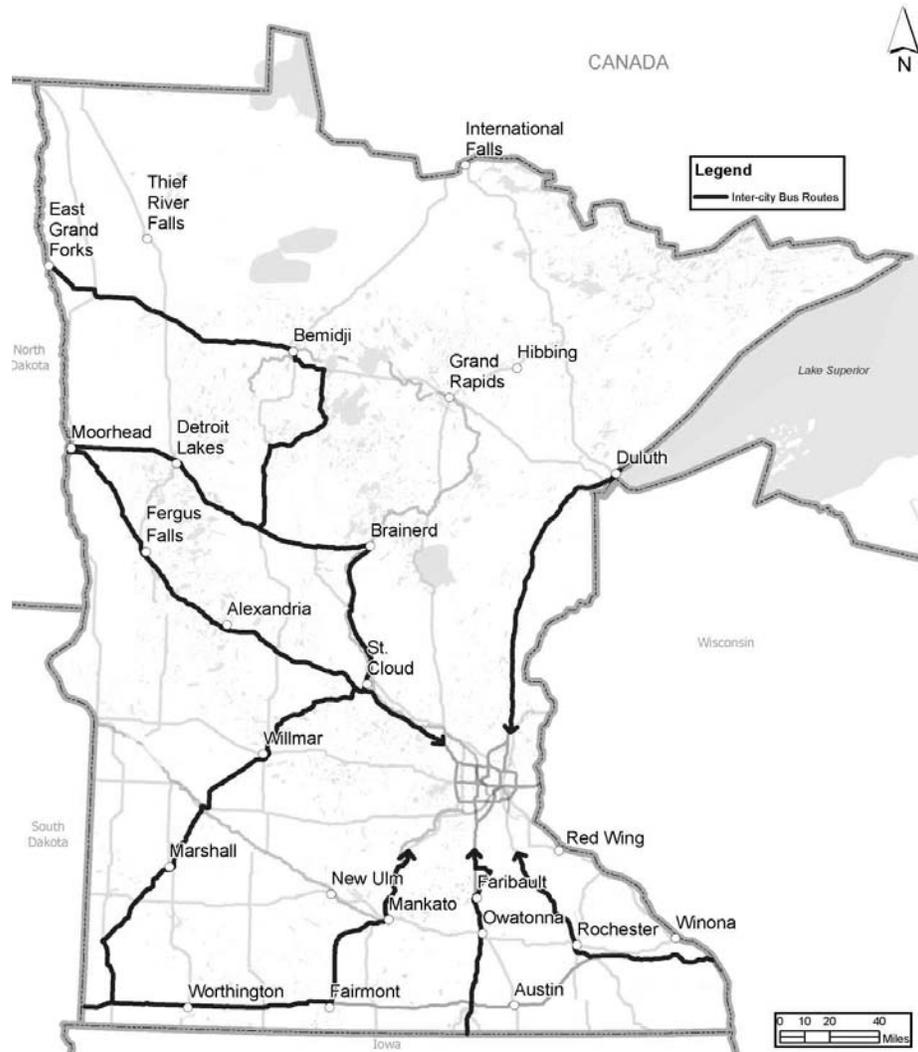
As of 2005, a total of 73 counties in Greater Minnesota have some level of public transit with 66 public transit systems in operation. These services operated over 14 million miles of service, provided over 9.3 million rides per year, and used a fleet of over 500 vehicles. This changed significantly from 1990 when public transit was available in only 59 counties throughout Greater Minnesota. Productivity of services, as measured by passengers per mile, has increased concurrently with the increases in transit services throughout Greater Minnesota. Passengers per mile for statewide services were 0.57 in 2002 and increased to 0.65 in 2005.

Public transit services throughout Greater Minnesota will provide an essential link in meeting future transportation challenges. As the population in Minnesota continues to grow and age, public transit will ensure that Greater Minnesota residents will have access to a safe, reliable, and affordable transportation mode.

### **Intercity Bus**

Mn/DOT is in the process of updating its 1997 Minnesota Intercity Bus Needs Study in an effort to properly meet basic mobility needs of rural populations, promote practical travel mode options, and enhance the quality of life for all Minnesotans. In Minnesota, intercity bus is described as regularly scheduled bus service for the general public that operates with limited stops over fixed routes connecting two or more urban areas not in close proximity, has the capacity for transporting baggage carried by passengers, and makes meaningful connections with scheduled intercity bus service to more distant points.

In Minnesota, there are two primary private intercity carriers, Greyhound and Jefferson Lines. Greyhound makes stops at more than 60 locations around the state, although some locations have very limited service, and has 2,400 locations in North America. Jefferson Lines operates on a more regional level, transporting Minnesotans to several locations across the state and 12 other states, including Iowa, Wisconsin, Nebraska, and Texas. A third for-profit operation, known as Megabus, also operates out of Minneapolis and Saint Paul and offers connections to other major Midwest cities, including Milwaukee, Madison, and Chicago. Figure 3.11 shows Minnesota's existing intercity bus routes.



**Figure 3.11 Existing Intercity Bus Routes**

Source: *Russell's Guide July 2008, Metro Transit, and Mn/DOT Office of Transit*

### Transit Advantages and Ridesharing

Transit advantages are improvements or modifications made to the highway system that provide a service advantage or benefit to transit and vehicles carrying two or more people. Examples of these improvements include the following:

#### High-Occupancy Vehicle and High-Occupancy Toll Lanes (HOV/HOT)

An HOV lane is a lane reserved, at least during peak periods, for the exclusive use of high occupancy vehicles (carrying two or more people) such as buses, vanpools, and carpools. The Twin Cities' HOV system operates in two separate corridors: I-35W and I-394.

In May of 2005, Mn/DOT broke ground on the state's first high-occupancy toll (HOT) lane set to operate in the I-394 corridor. The overall program, known as Mn/PASS, sought to improve the usage of the existing HOV lane constructed in 1992. HOT lanes permit single occupant drivers to pay a user fee to access the HOV lanes while speeds and capacity of the HOT lane are maintained by

dynamically changing the toll according to the demand and use of the lane. The tolls range from \$0.25 up to \$8.00 and in-vehicle transponders are used to allow for electronic and seamless collection of the toll.

Included as part of the UPA grant awarded to Minnesota, the existing HOV lanes along I-35W between I-494 and Burnsville Parkway are being converted to HOT lanes. Additionally, the left northbound shoulder between 46th Street and downtown will be converted to a Priced Dynamic Shoulder Lane (PDSL). These improvements will be in place and impact congestion and commute times during 2009 and 2010.

### **Signal Preemption**

Traffic control signals may be designed and operated to respond to certain classes of approaching vehicles by altering the normal signal timing and phasing as vehicles approach. Options may be as simple as extending a currently displayed green light or as complex as replacing the entire set of signal phases and timing.

Preemption control and priority control are two different types of traffic controls. Preemption control is typically given to emergency vehicles and to vehicles such as boats (at lift-bridges) and trains. Examples include a prompt green signal at signalized intersections for fire vehicles, police cars, ambulances, and other official emergency vehicles and special signal phases and timing to allow additional clearance time for vehicles to clear railroad tracks prior to an oncoming train.

When priority control is used, it is typically given to non-emergency vehicles such as buses to gain an early or extended green signal at an intersection. Priority control helps public transit vehicles remain on schedule or improve their travel time and to use special phasing to enable public transit vehicles to enter the travel stream ahead of a platoon of traffic.

### **Bus-Only Shoulders**

Bus-only shoulders are transit advantages designed to provide faster and more reliable transit commutes in congested corridors. Bus-only shoulders look and operate like any other shoulder with the exception that certain buses are permitted to use the shoulders in designated areas in order to bypass slow-moving traffic. There are more than 280 miles of bus-only shoulders in the TCMA.

Authorized transit vehicle operators are allowed to use bus-only shoulders only when mainline traffic is moving at speeds less than 35 miles per hour. The maximum allowable speed is 35 miles per hour, and vehicles may not exceed the speed of the adjacent traffic by more than 15 miles per hour.

### **Dedicated Busways**

Exclusive busways may play an important role in the region's transit system effectiveness in the next 25 years. As congestion grows, keeping the TCMA mobile will become more and more difficult. Busways typically provide faster service than traditional on-street bus service and may be less expensive to build and operate than light rail.

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*There is currently one operating busway in the region serving primarily the University of Minnesota's campuses.*

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Experience elsewhere in the U.S. shows that busways emphasize speed and frequency, with a minimal number of stations at timed transfer points. Busways need to be designed and operated in ways that minimize noise and pollution through appropriate vehicle technology and reduce visual impacts through landscaping and roadway configuration.

There is currently one operating busway in the region serving primarily the University of Minnesota's Minneapolis and Saint Paul campuses. The Metropolitan Council's 2030 Master Transit Study identifies the Bottineau Corridor connecting Minneapolis with Maple Grove or Brooklyn Park as having dedicated busway potential.

### **Ridesharing**

Supplementing the bus and rail transit systems, park-and-ride lots, park-and-pool lots, ridesharing programs, and carsharing programs further promote ridesharing in Minnesota. Park-and-ride lots provide a place for people to park their vehicle and access the bus or rail transit system. Park-and-pool lots provide a place where people can park their vehicle and access a car or vanpool.

Car and vanpool programs are supported by the Metropolitan Council and Mn/DOT. The Metropolitan Council organizes ridesharing options for commuters who live or work in the Twin Cities Metropolitan Area. Mn/DOT, through its Rideshare Coordinator funded by the Federal Highway Administration, offers technical assistance to employers in Greater Minnesota in the development, marketing, and promotion of ridesharing options.

### **Bicycle and Pedestrian Travel**

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*Minnesota's elderly population may require a greater level of service for accessible pedestrian and bicycle facilities to promote active living.*

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Bicycle and pedestrian transportation is at a critical point in Minnesota as demand for bicycle and pedestrian systems that connect residential areas, work places, libraries, parks, and schools increases. Increasing the number of trips taken by bike and by walking is a goal shared by many across the state, from healthcare providers to school systems, and from cities responding to the growing number of elderly and transit users. Anticipated increases in Minnesota's elderly population may require a greater level of service for accessible pedestrian and bicycle facilities to promote active living. Bicycle and pedestrian facilities can include shoulders, sidewalks (walkways), shared use paths, trails, pedestrian bicycle tunnels or bridges, and connecting paths.

Due in part to an increased interest in alternate modes of transportation, many cities and counties are developing their first-ever bicycle and pedestrian plans in an effort to establish more walkable and bikeable communities. For example, Minneapolis recently completed its first Pedestrian Master Plan and Bicycle Master Plan.

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*Minnesota leads the country in miles of off-road bicycle and pedestrian trails.*

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In addition to having an extensive roadway system serving bicyclists and pedestrians, Minnesota leads the country in miles of off-road bicycle and pedestrian trails. In Minnesota, bicyclists are allowed to ride on all roads except where signed to prohibit biking, which includes limited-access expressways. Most residential streets are considered safe for bicyclists because of low traffic volumes and lower vehicle speeds.

Bicycle parking facilities are an important part of planning for bicyclists. They help to encourage riding and discourage bicycle theft. Bicycle parking facilities also serve as a visual reminder to people that bicycles and bicyclists are welcome. Because many bicyclists also take advantage of public transportation to increase the distance they can cover, all LRT stations have bicycle parking and many transit hubs have bicycle racks and lockers. Additionally, most transit systems across the state have bicycle racks on-board their vehicles.

According to a recent City of Minneapolis evaluation of the Census Bureau's 2007 American Community Survey, Minneapolis ranks high compared to other U.S. cities in alternative forms of transportation, particularly bicycling. According to the data, Minneapolis ranks second behind Portland out of the 50 cities with the most workers for its share of commuters who commute to work by bicycle and ninth for its share of commuters who commute to work by walking. The survey also highlights other Minnesota cities (with populations greater than 57,000 persons) with a noteworthy bicycle commute mode share including Saint Paul, Duluth, St. Cloud, Rochester, Plymouth, Bloomington and Brooklyn Park.

### **Mn/DOT'S Role in Moving People**

Mn/DOT serves a direct role in moving people through its charge of constructing, operating, maintaining, and managing the state highway system. In addition to this direct role, Mn/DOT also provides administrative and coordination support in moving people throughout Minnesota, including the following:

- Develop long-range, statewide plans for passenger rail, intercity bus, bicycle and pedestrian accommodation on state highways, Greater Minnesota transit, and Greater Minnesota Aeronautics.
- Administer the state and federal programs for passenger rail transit. Mn/DOT has statutory responsibility for overseeing the delivery and construction of commuter rail and light rail projects and for production of the state commuter rail plan.
- Coordinate Commuter Challenge (formerly Bike, Bus, or Pool – B-BOP) activities throughout the state. Commuter Challenge is a year-round effort that helps to coordinate and provides information about alternative transportation use. It is promoted through an Office of Transit web page that is used statewide.
- Construct, operate, maintain, and manage transit advantages on the state highway system.
- Provide safe bicycle and pedestrian access along and across state highways by ensuring that these modes are appropriately planned for and accommodated within the context of Mn/DOT plans, policies, standards, and projects.

- Provide interjurisdictional coordination to develop efficient and continuous bikeway systems and walkways that cross jurisdictional boundaries, railroads, rivers, and interstates in an effort to eliminate barriers and critical gaps and ensure adequate interjurisdictional connections and signage. Primary among those roles is to provide leadership and support for bicycle and pedestrian accommodation efforts in Minnesota. This is performed through a variety of functions, including:
  - Identify statewide trends and issues that affect bicycle and pedestrian travel and facility development.
  - Prepare policies and standards for bike and pedestrian facility development.
  - Provide training to state and local planners, engineers, and staff.
  - Administer federal and state aid funding to implement local governments' bicycle and pedestrian infrastructure projects.

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<sup>1</sup> Reebie Associates, 2001 TRANSEARCH® Commodity Flow Data. (1997 Community Flow Survey data used.)

<sup>2</sup> *Freight Analysis Framework*, Federal Highway Administration, 2004.

<sup>3</sup> *What is the National Highway System?*, Federal Highway Administration, <http://www.fhwa.dot.gov/hep10/nhs>.

<sup>4</sup> *River Transportation in Minnesota*, Minnesota Department of Transportation, Ports and Waterways Section, 2001, p. 10, 43.

<sup>5</sup> *River Transportation in Minnesota*, Minnesota Department of Transportation, Ports and Waterways Section, 2001, p. 10, 43.

<sup>6</sup> *Great Lakes Transportation in Minnesota*, Minnesota Department of Transportation, Ports and Waterways Section, 1994, p. 3.

<sup>7</sup> *Minnesota Aviation System Plan*, Minnesota Department of Transportation, Office of Aeronautics, 2006.

<sup>8</sup> *Information Brief*, Airports Council International, July 2008.

# Chapter 4:

## Major Trends and Travel Implications

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Minnesota is the 21st largest state in terms of population and the 12th largest state in terms of land area. Across its 84,000 square miles, homes and businesses dot the landscape, from remote rural areas, small towns, and midsize cities to the suburban communities and urban neighborhoods that make up the Twin Cities Metropolitan Area (TCMA).

The demand for transportation is largely determined by changes in the demographics of Minnesota's population as well as changes in the economy, and, without a doubt, Minnesota is changing.

This chapter examines the trends that influence travel in Minnesota. Knowledge of past, present, and future trends is essential in planning a balanced and efficient transportation system over the next 20 years.

Some of the key trends and associated impacts presented in this chapter include:

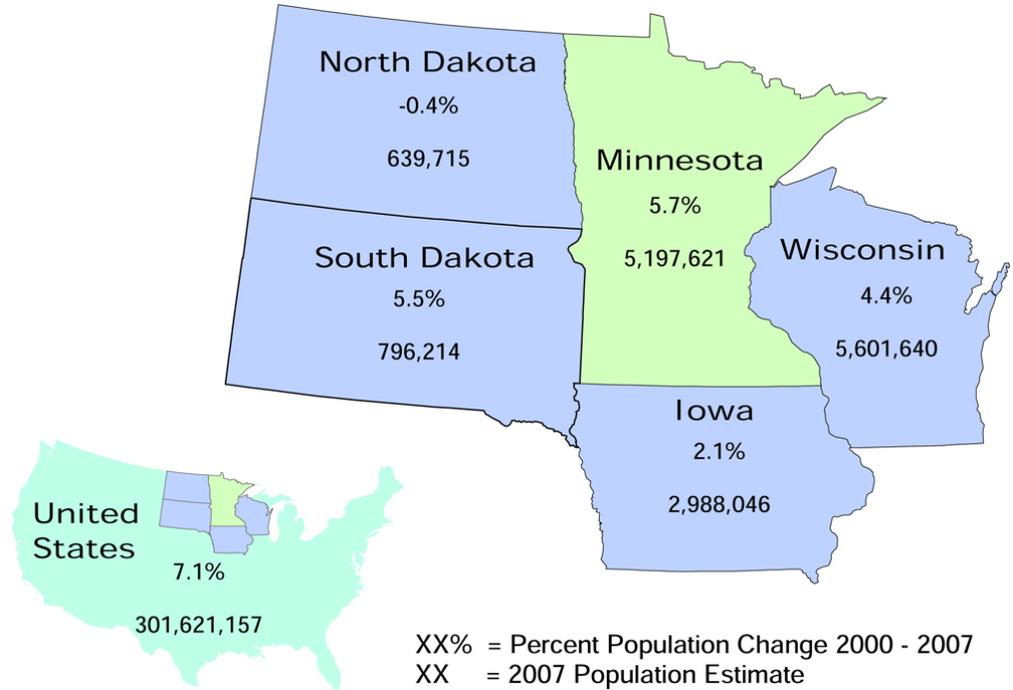
- Minnesota's population is growing, aging, and diversifying.
- Minnesota's economy is changing.
- Road use in Minnesota has leveled over the past three years.
- Fuel costs have become increasingly volatile and unpredictable.

### Population Trends

Population drives the demand for travel, and, therefore, it is important to acknowledge current population trends.

#### **Minnesota's Population is Growing and Has Outpaced Neighbor States but not the Nation**

In 1990, Minnesota had 4.4 million residents, and, in 2007, there were an estimated 5.2 million people living in the state – an increase of almost 19 percent. Since 2000, Minnesota's population growth has outpaced its neighbors (North Dakota, South Dakota, Iowa, and Wisconsin) but not the average national growth rate of 7.2 percent. Figure 4.1 compares Minnesota's growth rate with its neighbors and the nation.



**Figure 4.1 Population Growth from 2000 to 2007**

Source: U.S. Census Bureau

By 2035, Minnesota’s population is expected to increase by 1.3 million people (25 percent) to 6.4 million persons<sup>1</sup>. If the expected increase occurs, it would represent a population increase of almost 50 percent since 1990. Minnesota’s population growth and projections are presented in Table 4.1.

**Table 4.1 Minnesota Population Growth from 1990 to 2035**

Year	Population (Millions)	Growth Since 1990 (%)
1990	4.4	–
2000	4.9	12.4
2007	5.2	18.8
2035	6.4	47.3

Source: U.S. Census Bureau, Minnesota State Demographic Center

It is anticipated that about 80 percent of the 1.3 million new residents will populate the state as the natural result of more births than deaths. The remainder of the increase will come from net in-migration. Net in-migration occurs when more people move into a state than out over a period of time.

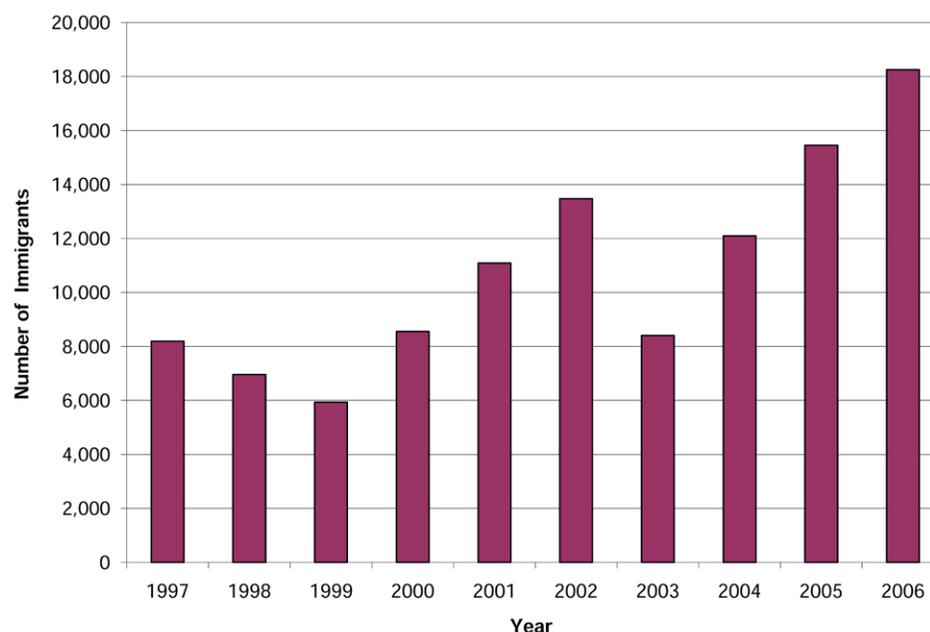
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*More people move to Minnesota from Wisconsin than from any other state.*

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In-migration can be domestic or the result of immigration from another country. The primary source of domestic in-migration is the State of Wisconsin. That is, more people move to Minnesota from Wisconsin than from any other state. International immigration has increased considerably in Minnesota over the past several decades with notable growth in the immigrant populations of Latinos, Hmong, Somalis, Vietnamese, Laotians, Cambodians, and Ethiopians.

The number of immigrants obtaining legal permanent resident<sup>2</sup> (LPR) status in 2006 was just over 18,000. Figure 4.2 shows the increase in Minnesota's immigrant population over the past decade – a 122 percent increase since 1997.



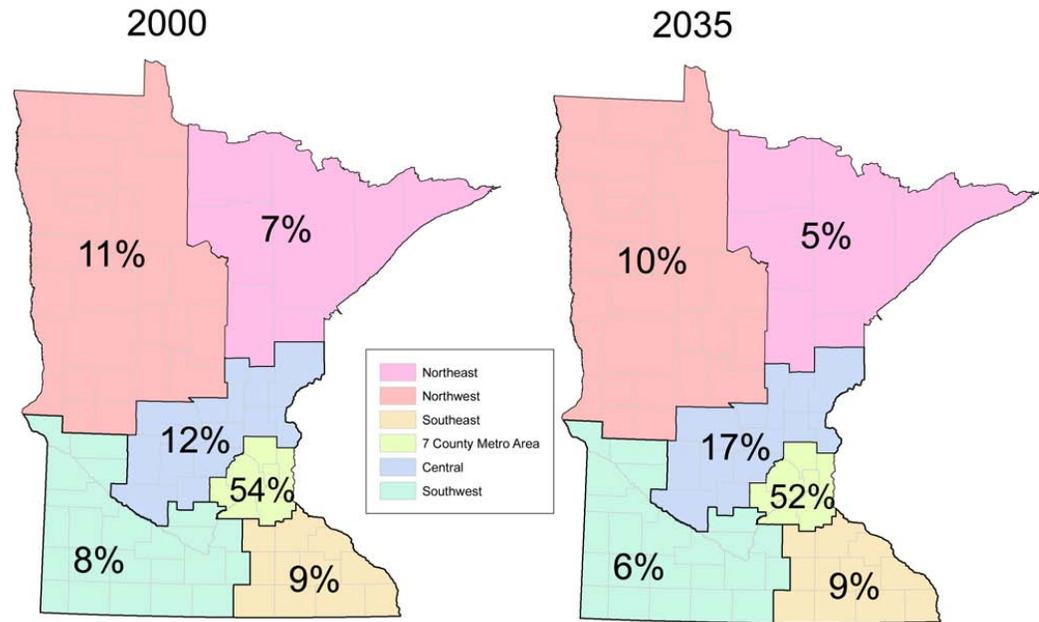
**Figure 4.2 Minnesota Immigration from 1997 to 2006**

Source: Department of Homeland Security, 2006 Yearbook of Immigration Statistics

## Minnesota's Population Growth Is Concentrated

Minnesota's cities, counties, and regions grow at different rates. For example, between 1990 and 2007, Central Minnesota grew by nearly 40 percent while the Southwest lost population; the seven-county TCMA (the seven core counties surrounding Minneapolis and Saint Paul – Hennepin, Ramsey, Carver, Scott, Dakota, Washington, and Anoka) grew by 22 percent while the Northeast grew by just three percent. Similarly, these regions will not likely grow at the same rates in the future. While Northwest Minnesota's population is projected to grow by 20 percent, Central Minnesota is projected to grow by more than 60 percent.

Much of the growth expected over the next 30 years will be concentrated in the TCMA, Central, and Southeast parts of the state and will be fueled primarily by growth in major urban areas including St. Cloud and Rochester. Figure 4.3 highlights each region's share of Minnesota's population in 2000 and what is projected in 2035.



**Figure 4.3 Regional Share of State Population from 2000 and 2035**

Source: U.S. Census Bureau, Minnesota State Demographic Center

Notable changes in regional population shares include:

- Central Minnesota’s share of the state’s population will increase five percent.
- The TCMA’s share of the state’s population will decrease from 54 percent in 2000 to 52 percent but its population will grow by 20 percent.
- The TCMA’s ring counties (the nine Minnesota counties adjacent to the seven-county TCMA - Chisago, Goodhue, Isanti, LeSueur, McLeod, Rice, Sherburne, Sibley, and Wright) share of the state’s population is projected to increase from 9.3 percent in 2007 to 13 percent in 2035.
- Between 2000 and 2007, population in the ring counties grew almost 20 percent while the seven-county metropolitan area grew just 5.9 percent.

### Major Metropolitan Areas

Minnesota’s metropolitan areas, many of which are Level 1 regional trade centers (RTC), are projected to grow considerably over the next 30 years. Rochester will grow by more than 35 percent while St. Cloud will grow by almost 40 percent. The growth of Minnesota’s major metropolitan areas is summarized in Table 4.2, and the metropolitan areas are shown in Figure 4.4.

**Table 4.2 Projected Growth of Minnesota Metropolitan Areas (Minnesota portions only) from 2005 to 2035**

RTC Level	Metropolitan Area	2005	2035	Percent Increase
0	Twin Cities	3,063,706	3,940,100	28.6
1	Fargo-Moorhead	54,385	68,100	25.2
1	Duluth-Superior	233,496	248,800	6.6
1	Lacrosse-La Crescent	20,154	22,400	11.1
1	Rochester-Olmsted	179,103	243,200	35.8
1	St. Cloud	183,182	253,600	38.4
2	Grand Forks-East Grand Forks	31,451	34,500	9.7

Source: U.S. Census Bureau, Minnesota State Demographic Center



**Figure 4.4 Metropolitan Areas in Minnesota**

Source: Mn/DOT Office of Investment Management

### Micropolitans

Micropolitans are defined in terms of whole counties (but often named for the principal city within them) and must have at least one urban cluster with a population between 10,000 and 50,000 persons. Minnesota has within its borders 17 micropolitans many of which are also Level 2 Trade Centers (Figure 4.5).



**Figure 4.5 Minnesota’s Micropolitans**

Source: Mn/DOT Office of Investment Management

According to Minnesota Department of Employment and Economic Development (DEED) analysis<sup>3</sup>:

- Between 2000 and 2004 the combined total population in the micropolitans increased by three percent (Minnesota’s population increased 4.6 percent during that time).
- Eleven of 17 micropolitans increased in population from 2000 to 2004.
- Mankato was the state’s largest principal micropolitan city with nearly 35,000 people in 2004.
- Rice County was the fastest growing micropolitan from 2000 to 2004.

- Population growth in Minnesota’s micropolitans will keep pace with the state’s growth rate over the next 20 years.

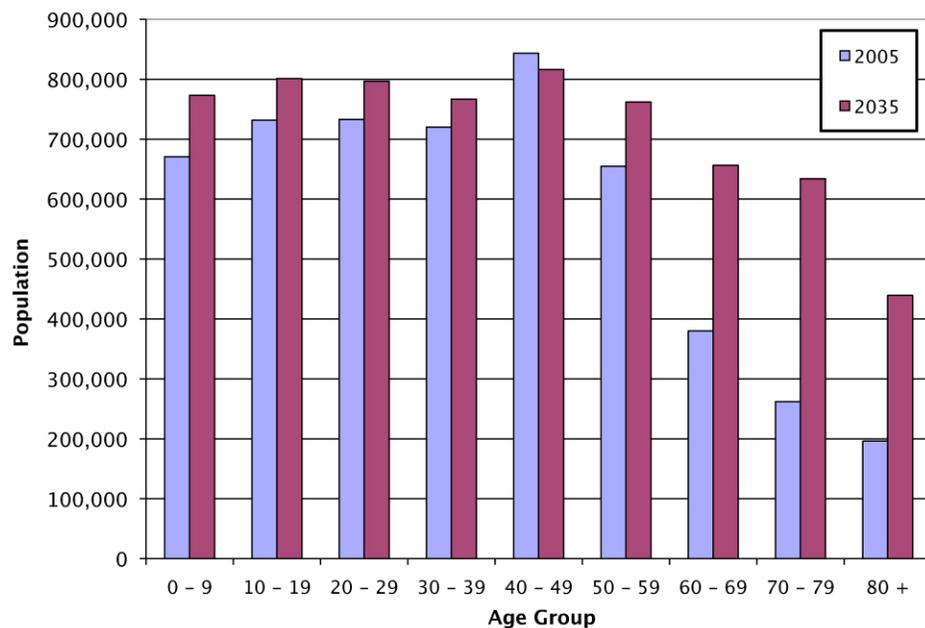
### Minnesota’s Population Is Aging

*Population age distribution directly affects demand for and use of transportation systems.*

Population age distribution directly affects demand for and use of transportation systems. For example, the number of children of school age will influence the number of school buses, the number of persons turning age 16 will influence the number of licensed drivers and potential new workers, and the number of persons age 20 to 24 is a strong indicator of the number of new households that will be formed. Additionally, the number of persons over age 65 may indicate the share of the population whose driving may be impaired by physical limitations, while the number over 85 may indicate the need for access to transportation options other than automobiles.

For many years, Minnesota’s median age (the age at which half the population is older and half is younger) has increased, and this trend will continue into the future for some time. The median age of Minnesota was 32.4 in 1990 and 37.1 in 2007. This is generally parallel to the national trend, although the nation’s median age was just 36.6 in 2007. Much of this overall trend is attributable to the aging of the baby boomer generation.

Figure 4.6 displays how different age groups are projected to change between the 2005 estimates and the 2035 projection.



**Figure 4.6 Minnesota’s Population by Age**

Source: U.S. Census Bureau, Minnesota State Demographic Center

According to the Minnesota State Demographer, Minnesota’s future population will have the following characteristics:

- Over the next 25 years, the “less than 15” child population will increase slightly with suburbs of the Twin Cities experiencing much of the growth. Growth of this age cohort in southwestern and northeastern Minnesota will be slow.
- The 15 to 24 age group will experience declines over the next several years but will begin to rise after 2015.
- The population of Minnesotans between age 25 and 44 will increase slightly through 2015 and then stabilize.
- The number of people in the 45 to 64 age cohort will increase rapidly through 2015. This growth, projected to be almost 20 percent, will represent almost half of all population growth during that time.
- The 65 and older population will increase 125 percent (about 770,000 people) through 2035. The Twin Cities suburban counties will see substantial growth rates in this population over the next 30 years.
- The number of Minnesotans over the age of 85 will sharply increase after 2025 as those born in the baby boom era continue to age.

### Minnesota’s Population Is Becoming More Diverse

Minnesota’s population is more racially diverse than it was in 1990 and will be even more diverse in 2030 than it is today. Table 4.3 highlights the change over time in some of Minnesota’s largest racial and ethnic minority populations.

**Table 4.3 Minnesota Racial and Ethnic Minority Populations in 1990, 2000, and 2030**

Race/Ethnicity	1990		2000		2030	
	Population	Percent	Population	Percent	Population	Percent
White	4,130,395	94.4	4,400,282	89.4	5,255,500	83.4
Black	94,944	2.2	171,731	3.5	386,600	6.1
Asian	77,886	1.8	141,968	2.9	326,800	5.2
Hispanic/Latino	53,884	1.2	143,382	2.9	406,700	6.5
Other	71,874	1.6	122,756	2.5	–	–

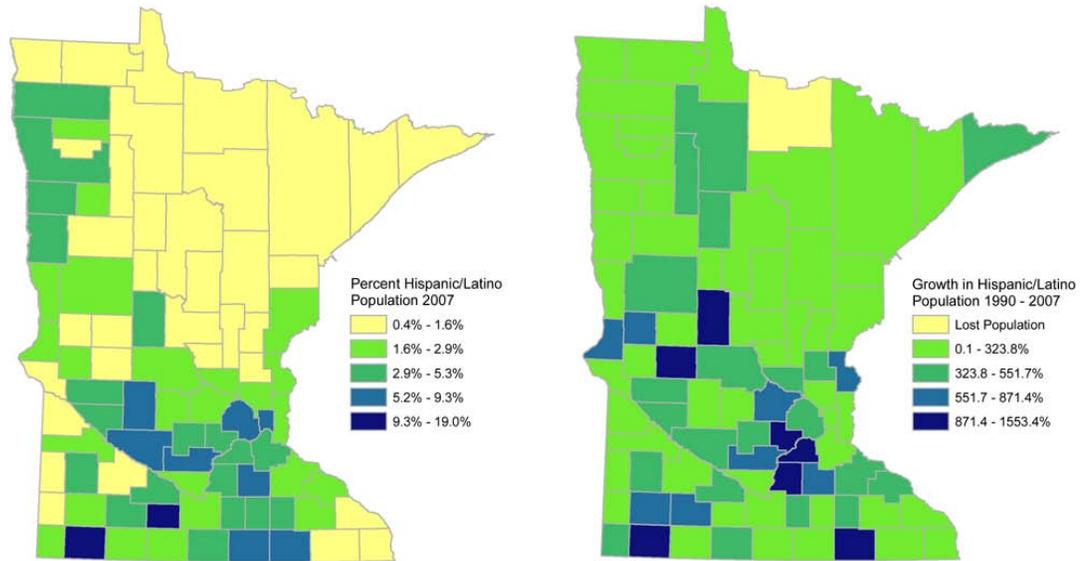
Source: U.S. Census Bureau, Minnesota State Demographic Center

According to the State Demographer, the following points characterize future growth of Minnesota’s racial and ethnic populations.

- Minnesota’s minority and Latino populations will likely grow faster than that of those who consider themselves white and no other race. However, the white population will remain the largest race group.
- The white population is expected to grow considerably in suburban counties while many rural counties, particularly in western Minnesota, will either remain stable or potentially decline.

- Minnesota's black population will remain the state's largest non-white racial group and is projected to grow 115 percent between 2000 and 2030.
- In 2030, the Latino population is projected to triple what it was in 2000.

Figure 4.7 displays by county the distribution of Minnesota's Hispanic and Latino populations in 2007 and highlights the growth of these populations.

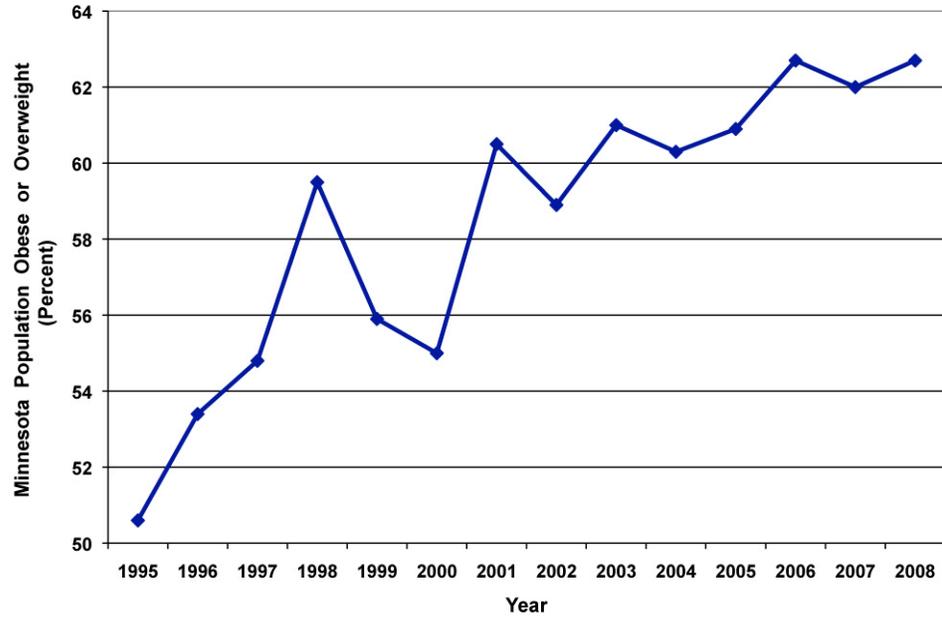


**Figure 4.7 Hispanic/Latino Population and Growth in Minnesota from 1990 to 2007**

Source: U.S. Census Bureau, Minnesota State Demographic Center

## Minnesotans' Health is a Growing Concern

The health of Minnesotans and all Americans has become an area of great concern over the past decade. Obesity in America is often described as an epidemic and the role of transportation and planning is increasingly discussed as part of the problem as well as an important part of the solution. There is a considerable body of research and a number of planning initiatives that seek to understand and consider the role of city and transportation planning in the health and activity levels of citizens. It is generally accepted that physical activity is an important part of a healthy lifestyle and may as a result decrease likelihood of obesity. Some researches take this argument a step further to suggest that the compact design of our neighborhoods coupled with transportation infrastructure that makes it easier to consider modes of transportation other than the automobile (e.g., bicycle, walking) could lead to a healthier populace. Figure 4.8 highlights the rise in the percent of Minnesotans that are obese or overweight.



**Figure 4.8 Percent of Minnesotans Obese or Overweight (1995 – 2008)**

Source: National Center for Chronic Disease Prevention and Health Promotion: Behavioral Risk Factor Surveillance System

## Transportation Implications of Minnesota’s Demographic Trends

- Minnesota’s population growth will further increase the number of transportation system users.
- Concentrations of population in the TCMA, other metropolitan areas, and micropolitan areas will increase congestion, commuting time, and commuting patterns.
- Population growth in most areas of the state will have a direct impact on vehicle miles of travel (VMT).
- The large increase in Minnesota’s elderly population will result in higher proportions of elderly drivers and greater demand for transit services and pedestrian appropriate facilities and may require new and innovative roadway design, traffic engineering, and signage standards.
- Environmental justice will continue to be important when planning transportation projects due to the growth in minority populations in the state.

## Economic Trends

In many ways, a state's transportation infrastructure serves as the backbone of its economy through provision of access to markets, jobs, and services. Transportation serves to connect people and goods to communities, other states, and even other countries. Just as the United States' economic performance is largely determined by the combined economic performance of its 50 individual states, so too is Minnesota's economy largely dependent on the sum of the performance of its diverse parts – its regions. This section reviews the trends impacting the state as a whole and then narrows the focus toward Minnesota's regional economies.

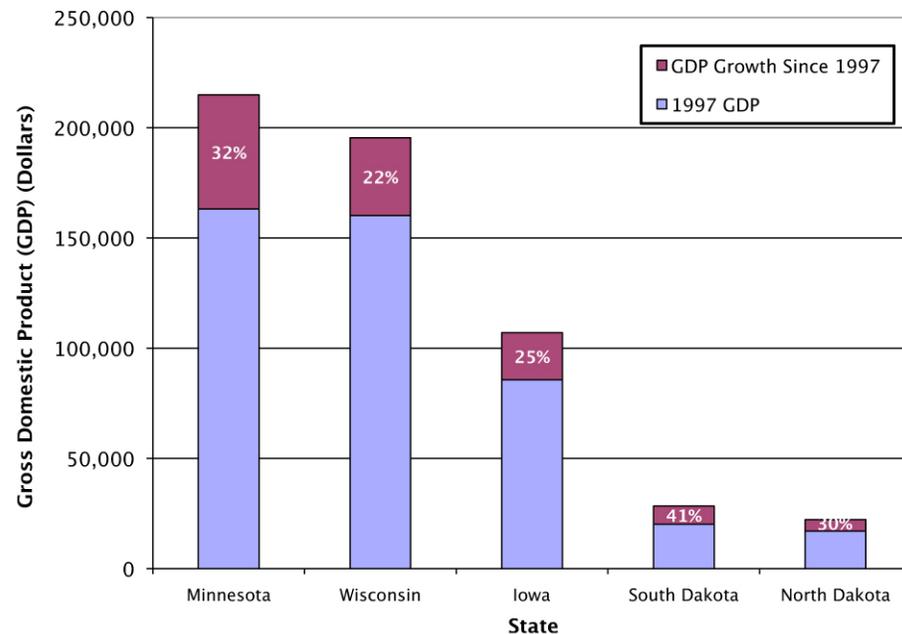
### Minnesota's Gross Domestic Product Has Grown Steadily

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*Minnesota's GDP grew steadily and only slightly less than the nation's rate of growth.*

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Gross domestic product (GDP) by state is an important measure of any state's economic production. Minnesota's GDP is the sum of the value added to goods and services by all industries in Minnesota and is a measure similar to the nation's GDP. Figure 4.9 compares Minnesota's GDP to that of its neighbors. From 1997 to 2007, Minnesota's GDP grew steadily and only slightly less than the nation's rate of growth (33 percent).



**Figure 4.9 Growth in Gross Domestic Product by State from 1997 to 2007**

Source: Bureau of Economic Analysis, U.S. Department of Commerce

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*Minnesota's economy is well diversified and very similar to the diversity of the U.S. economy.*

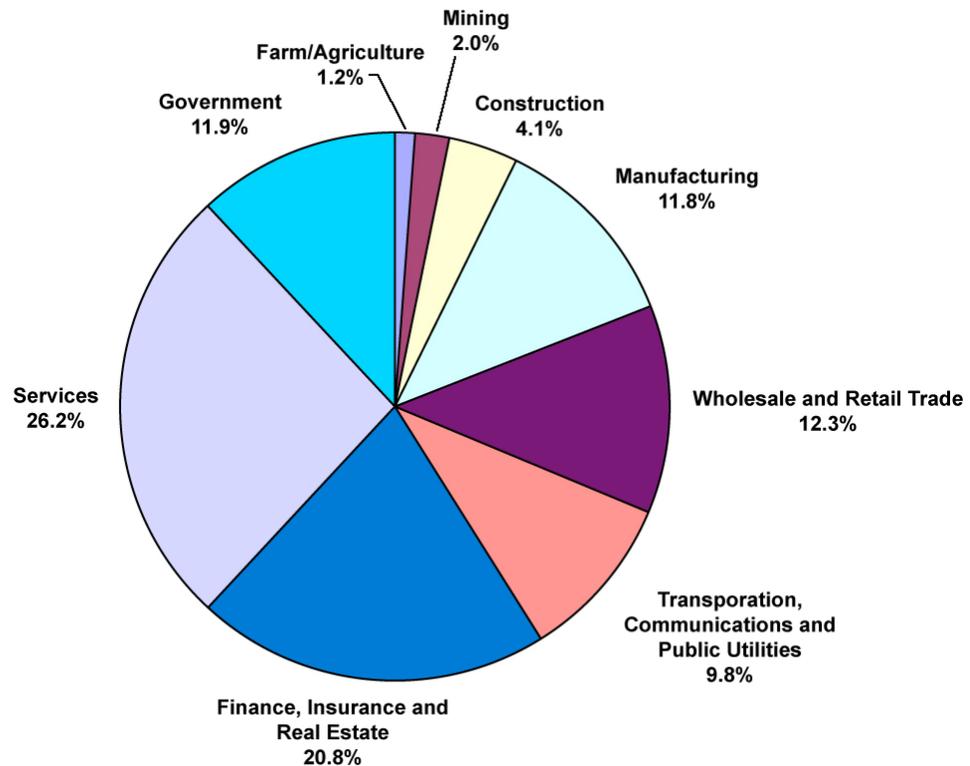
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## Minnesota Has a Diversified Economy

Minnesota's economic history is punctuated by diversification and adaptation. For much of the first half of the 20th century and through the 1960s, Minnesota's economy was fueled primarily by resource-based industries such as timber, mining, and agriculture. However, in the 40 to 50 years that followed, other sectors began to grow more rapidly than those based on natural resources. The end result was a state economy that looked quite similar to that of the nation. Throughout this time, substantial growth occurred in the services sector, which consisted of the business services and healthcare sectors. During this period of transformation, Minnesota's manufacturing output remained stable allowing the state to weather turbulent economic events, such as the downturn of the iron mining industry<sup>4</sup>.

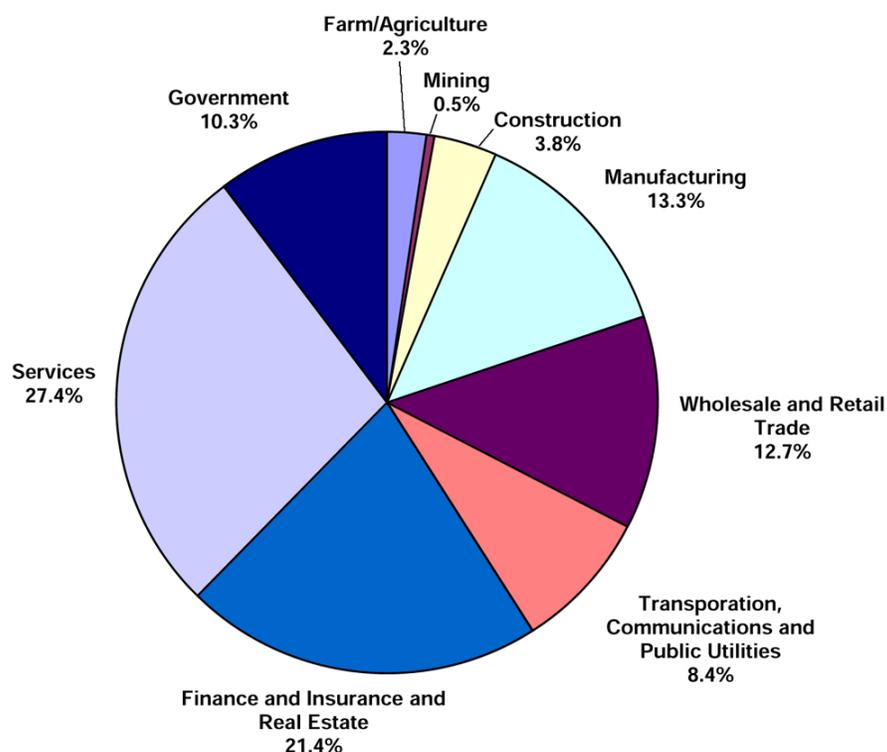
Today, Minnesota's economy is well diversified and is similar to the diversity of the U.S. economy. Figures 4.10 and 4.11 show the relative importance of major industries to the nation and to Minnesota.

In 2007, manufacturing and services accounted for 38 percent of US Gross Domestic Product (GDP) compared to 40.7 percent of Minnesota's GDP. Transportation, Communications, and Public Utilities accounted for 9.8 percent of US GDP and 8.4 percent of Minnesota's GDP. Many other similarities are identifiable through comparison of the two figures.



**Figure 4.10 U.S. Gross Domestic Product by Industrial Classification**

Source: Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce



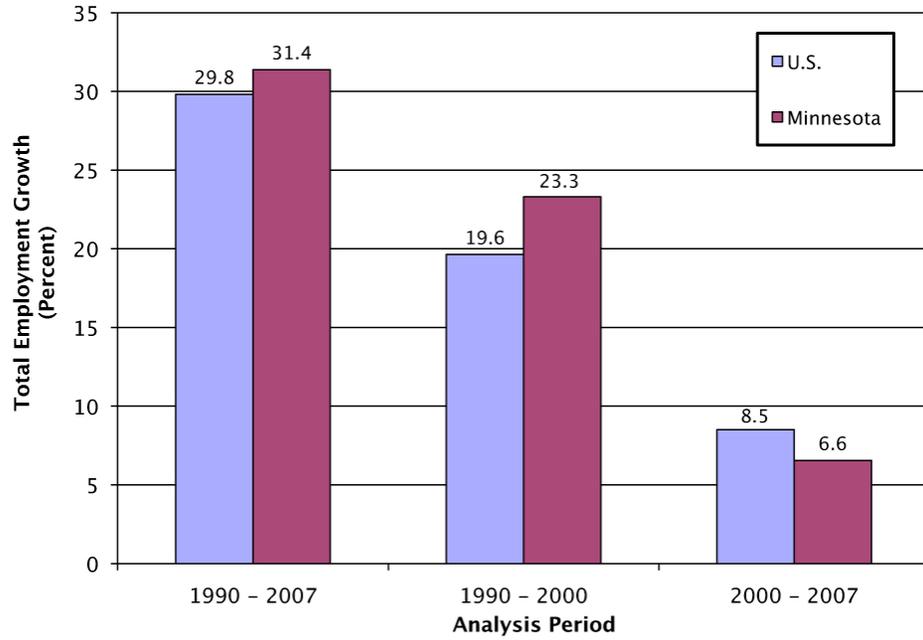
**Figure 4.11 Minnesota Gross Domestic Product by Industrial Classification**

Source: *Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce*

## Employment Growth Has Slowed

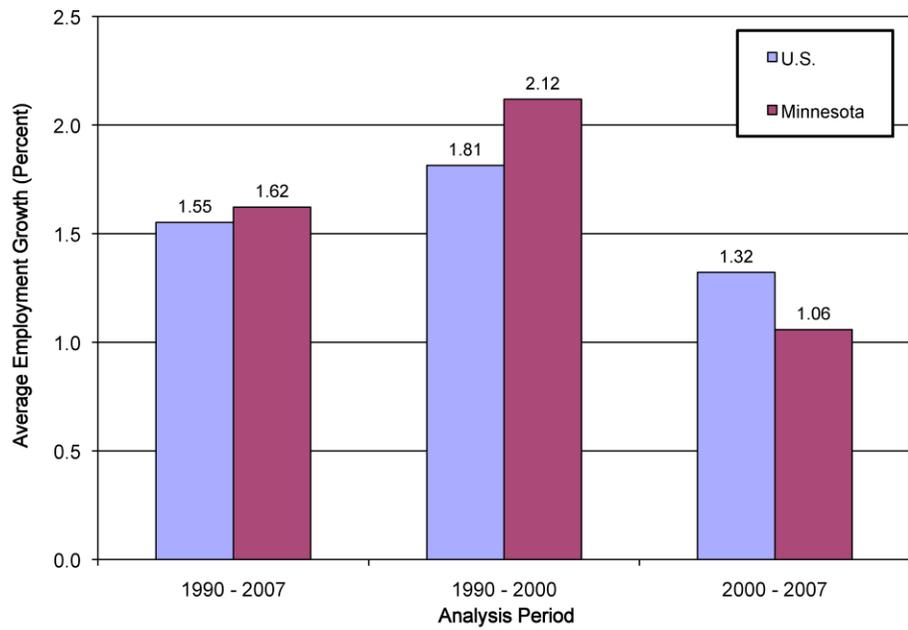
Between 1990 and 2000, Minnesota's employment grew by 23 percent while the nation's employment grew by about 20 percent. In that decade, the state grew by more than 600,000 jobs that, combined with other states, accounted for the nation's more than 27 million new jobs.

Since 2000, however, it has been a different story as Minnesota has not kept pace with the growth experienced in the 1990s and is no longer beating national trends. Between, 2000 and 2007, Minnesota gained about 219,000 new jobs – just about one third of the 1990s growth – at a rate of 6.6 percent. Jobs in the U.S. grew by 8.5 percent during that time, which created more than 14 million new jobs. Figures 4.12 and 4.13 highlight Minnesota and national average annual growth and percent growth over key time frames.



**Figure 4.12 U.S. and Minnesota Employment Growth from 1990 to 2007**

Source: Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce



**Figure 4.13 U.S. and Minnesota Average Annual Employment Growth from 1990 to 2007**

Source: Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce

## Recent Shifts in the Economy

Minnesota's economy continues to face new challenges, many of them very recent, again necessitating reliance on a diverse economy. According to March 2008 data from multiple Minnesota state agencies<sup>5</sup>, several industry sectors experienced negative job growth between 2005 and 2007. This includes the financial activities, natural resources, information, manufacturing, and construction sectors. Moreover, construction jobs in the state decreased more than five percent in that time. This also reflects structural changes in the information and air transportation industries and Minnesota's lack of benefit from national oil, gas, and defense spending habits. It is important to note that the economy continues to shift almost daily, and the impacts are often not known until new data become available and are analyzed.

The recent slowdown in Minnesota's housing market has had a profound short-term impact on jobs. The following job losses in housing-related industries were recorded between the third quarters of 2005 and 2007:

- 3,100 jobs lost in wood product manufacturing.
- 4,100 jobs lost in mortgage banking.
- 12,000 jobs lost in construction.

Some longer-term (2000 to 2006) job losses include:

- 3,000 jobs lost in air transportation.
- 10,000 jobs lost in information-related industries including publishing and telecommunications.
- 49,400 jobs lost in manufacturing.

Another key trend affecting Minnesota's job growth performance is an increased reliance on part-time workers in lieu of full-time. Data suggests more part-time workers are working between 20 and 35 hours, fewer are working less than 20, with an end result being a decreased need for full-time workers. There are notable bright spots for the state, however, including high-tech manufacturing, machine shops, insurance carriers, and health care industries.

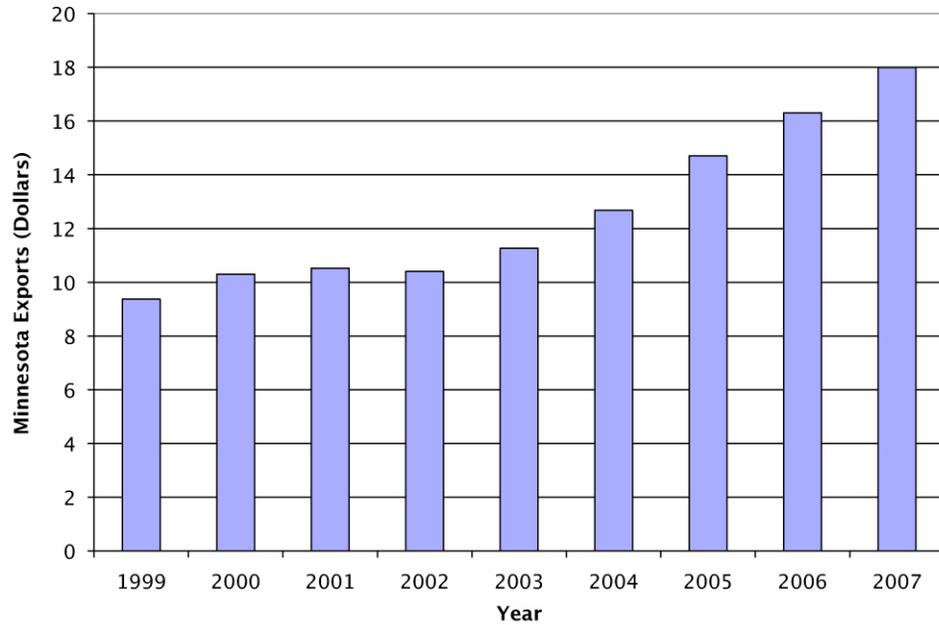
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*The value of international exports nearly topped 18 billion dollars.*

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### International Exports Have Increased

Growth of international trade continues to be a significant driving force for Minnesota’s economy, as exports to more than 200 trading partners continue to rise. Since 1999, total trade has increased on average 8.6 percent; however, recent years have seen increases as high as 16 percent. In 2007, the value of international exports nearly topped 18 billion dollars, as evidenced by Figure 4.14. Some of Minnesota’s key trading partners include Canada, Japan, China, Germany, and Mexico.

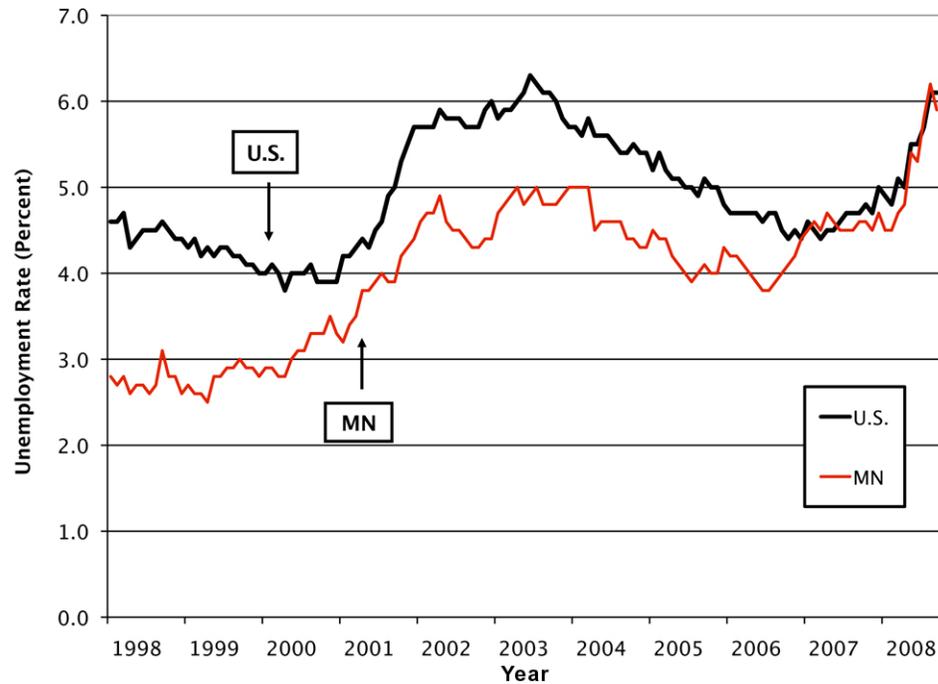


**Figure 4.14 Minnesota Exports from 1999 to 2007**

Source: U.S. Department of Commerce

## Unemployment Is Increasing and Has at Times Exceeded the National Rate

Minnesota's rate of unemployment is increasing and converging on the national rate. Prior to 2007, Minnesota had enjoyed a 30-year streak of an unemployment rate lower than that of the nation. This changed in 2007 when Minnesota's unemployment rate rose above the national level. It has not remained so every month since, although it has followed the same upward trend. Figure 4.15 displays Minnesota and U.S. unemployment rate trends over the past decade and presents the most recent available data at the time of writing.

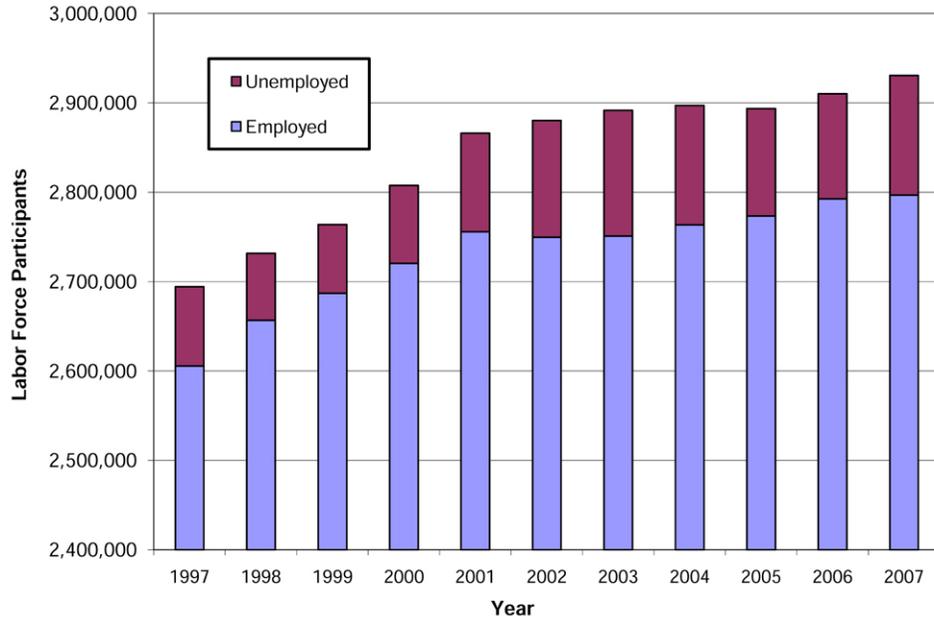


**Figure 4.15 U.S. versus Minnesota Unemployment Rate from 1990 to 2008**

Source: Bureau of Labor Statistics

## Minnesota’s Labor Force Will Grow and Age

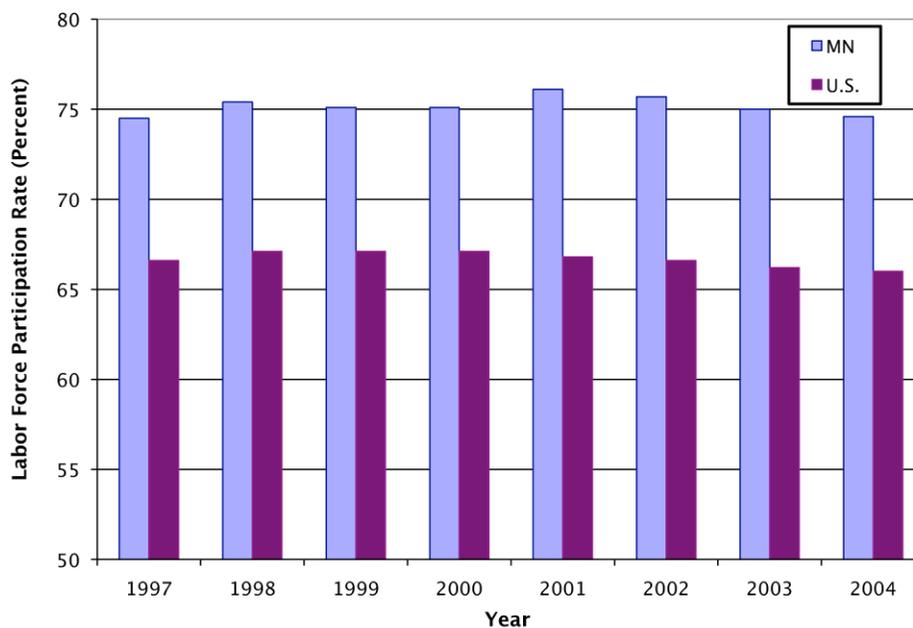
Minnesota’s labor force is comprised of individuals who are employed, individuals who are temporarily absent from work, and individuals who are not working but are looking for work (unemployed). Figure 4.16 displays the upward trend in the size of Minnesota’s labor force as well as the steadily increasing unemployed portion of the labor force. The figure also highlights how the rate of growth of the labor force slowed considerably after 2000.



**Figure 4.16 Minnesota’s Labor Force from 1997 to 2007**

Source: DEED, Bureau of Labor Statistics, U.S. Department of Labor

Labor force participation rates, different from the total size of the labor force, are a measure of the percent of people in the labor force. Figure 4.17 highlights the participation rates of Minnesotans and the U.S. as a whole. In 2004, Minnesota had the highest labor force participation rate in the nation (74.6 percent) and has consistently exceeded the national rate.



**Figure 4.17 Labor Force Participation Rates from 1994 to 2007**

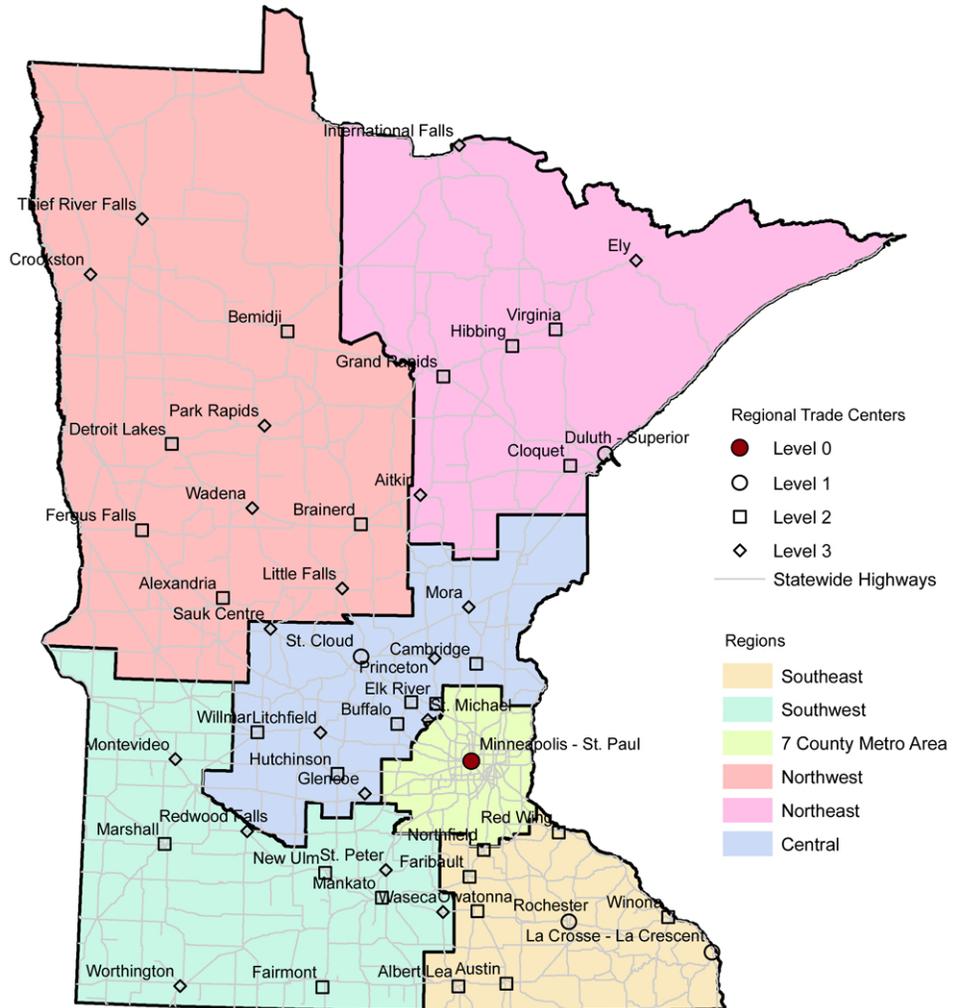
Source: U.S. Department of Labor, DEED

In 2003, the Minnesota State Demographic Center published projections concerning the future of Minnesota's labor force<sup>6</sup>. Following are some of key findings:

- The labor force is projected to grow by 26 percent (for a total of about 3.4 million workers) during the first 30 years of the millennium. Population growth and increasing labor force participation rates will be the primary contributors to growth.
- Minnesota's labor force will become older as the baby boom generation grows older. After 2015, when baby boomers begin to age past 65, the labor force participation rates of those over 65 year of age will increase substantially.
- Suburban counties with fast population growth (e.g., Carver, Scott, and Sherburne) will experience the largest increases in labor force through 2030.
- Some counties in western Minnesota are projected to experience declines in their labor force, with more counties losing population as the decades go by.

## Minnesota Economy Varies by Region

The remainder of this chapter summarizes Minnesota’s regional economies based primarily on DEED’s analysis in the *State of the State* report that highlights Minnesota’s regional diversity<sup>7</sup>. Minnesota is subdivided into six planning regions, which are a useful way to identify and conduct analysis at a more focused level. The six planning regions are presented with regional trade centers in Figure 4.18.



**Figure 4.18 Minnesota Regions and Regional Trade Centers**

Source: Mn/DOT Office of Investment Management

## Southeast Region

Prior to the 2001 recession, the Southeast Region illustrated in Figure 4.19 had experienced solid employment growth that allowed it to weather economic fluctuations. Since 2001, job growth has been slow but reached 1.8 percent in 2006. Job losses in manufacturing since 2000 have been largely replaced by growth in the healthcare and social assistance industry. This industry led job growth in the region but all sectors added jobs post 2004. The Southeast Region's unemployment rate increased between 2001 and 2003 and then declined from 2003 to 2006. Wages in the Southeast are lower than the state overall but better than many other regions in Greater Minnesota. The region boasts more than 15 private and public education institutions, which lends itself to high levels of educational attainment. From a labor force perspective, increased work force participation by young workers will likely not be enough to counteract the impacts of baby boomer retirements on the working age population.



**Figure 4.19 Southeast Region**

Source: Mn/DOT Office of Investment Management

### Southwest Region

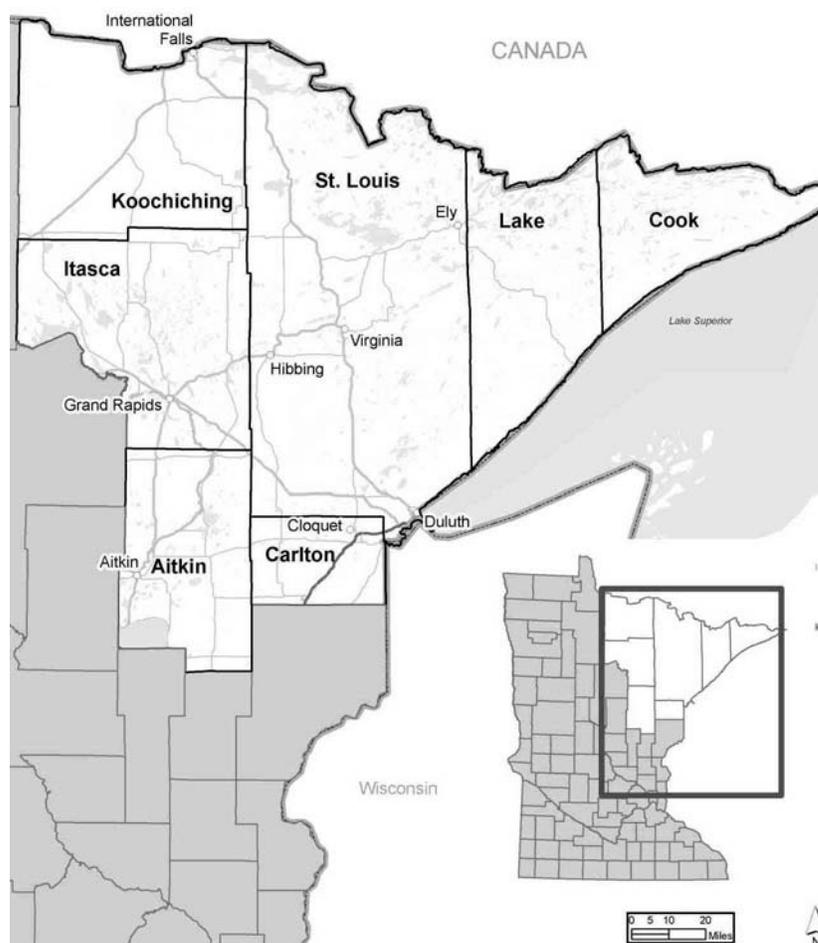
The largely rural region illustrated in Figure 4.20 has more than 20,000 farms and depends heavily on agriculture and manufacturing industries for its economic health. The region, however, is shifting from traditional industries in an effort to increase population and create jobs in new industries. Since the 2001 recession, the Southwest has experienced moderate job growth largely due to its focus on renewable energy. In fact, two thirds of the state’s ethanol plants, biodiesel plants, and wind power farms are located in the region. While agriculture provides the basis for the region’s economy, manufacturing and healthcare and social assistance industries have been adding jobs. Although most farms (many of which are increasing in terms of acreage) are family or individually owned, it is becoming increasingly common that the operator no longer lives at the farm they are operating. Wages are comparatively low in the Southwest Region and so too are unemployment rates. With an aging population and a trend of younger age groups leaving the region, Southwest Minnesota has benefited by the arrival of residents from other countries.



**Figure 4.20 Southwest Region**  
 Source: Mn/DOT Office of Investment Management

## Northeast Region

The Northeast Region, illustrated in Figure 4.21, relies on iron mining, logging, paper mills, and wood product manufacturing for its economic foundation. While the region experienced a decline in total employment between 2000 and 2003, it has since seen consistent increases of almost one percent annually. Similar to other regions, the healthcare and social assistance industry is strong and growing in the northeast. Global competition in iron ore mining and manufacturing continues today, but it is foreign direct investment in regional paper mills and iron ore mining facilities that have kept this region competitive in the global marketplace. Further, increased global demand for natural resources has breathed new life into the region's iron ore mines. The unemployment rate varies considerably in the region, and, while it has been higher than the state's rate, it has decreased over the past few years. Individuals over 55 will comprise the fastest growing segment of the population, which will have a significant impact on the working age population.



**Figure 4.21 Northeast Region**

Source: Mn/DOT Office of Investment Management

### Northwest Region

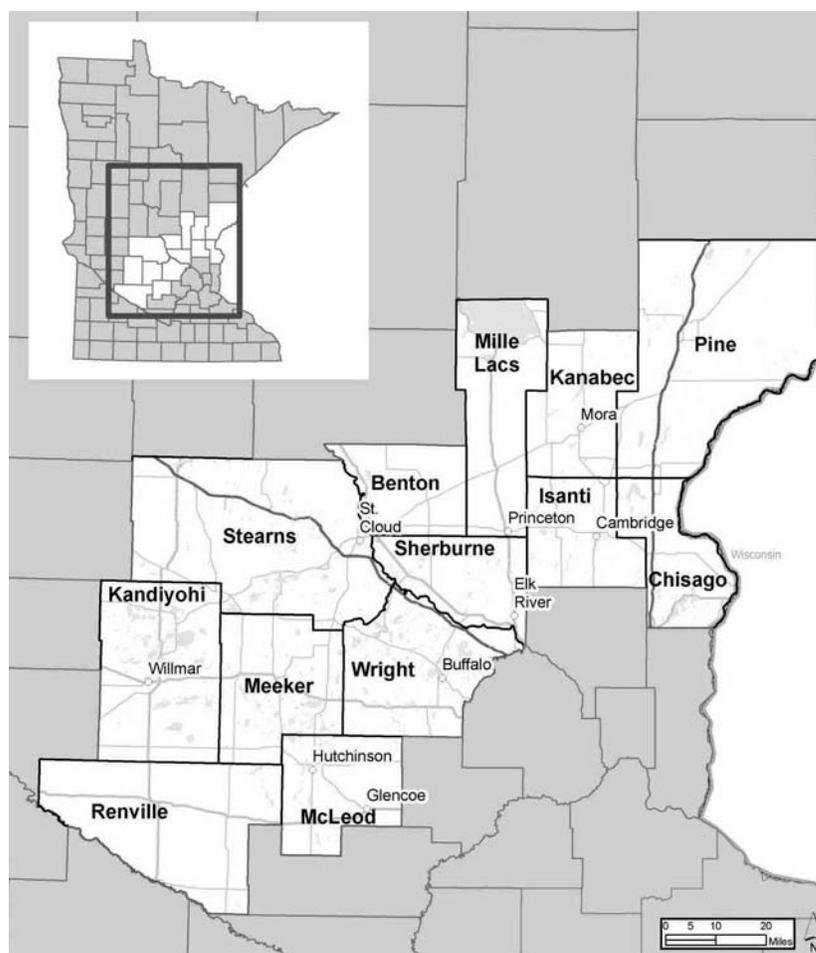
The northwest is one of Minnesota’s most diverse regions due in part to its large geographic size, as shown in Figure 4.22. In the north, large swaths of public land and Indian reservations exist while the south has several dense population centers along major roadways. The region has done a good of weathering the 2001 recession, reporting some measurable growth in employment every year but one between 2001 and 2006. From 2001 to 2003, the region’s unemployment rate increased but then decreased back to near 2001 levels – a pattern seen in many of the state’s regions. Median wages in the Northwest Region are lower than the state’s with the exception of farming, fishing, and forestry jobs. The baby boomer retirements are projected to impact this region in terms of slow growth in the working age population through 2030.



**Figure 4.22 Northwest Region**  
 Source: Mn/DOT Office of Investment Management

## Central Minnesota Region

Central Minnesota, shown in Figure 4.23, is the fastest growing of all Minnesota regions in terms of population, a trend that is expected to continue. Because of the region's recreation and natural assets, many of its older residents are likely to stay in the region after retirement. In contrast to other regions, baby boomer retirements are not expected to have negative impacts on the area's workforce. This is partially because the region has experienced an in-migration of young families as well as a significant diversification of the population in terms of race and ethnicity. Commute times are increasing in some counties of this region, particularly those with substantial percentages of its residents leaving their county of residence for work (often heading for the metropolitan area). This region did not experience the same declines in employment growth as did many other Minnesota regions. The largest employment growth has been seen in the healthcare and social assistance followed by manufacturing.

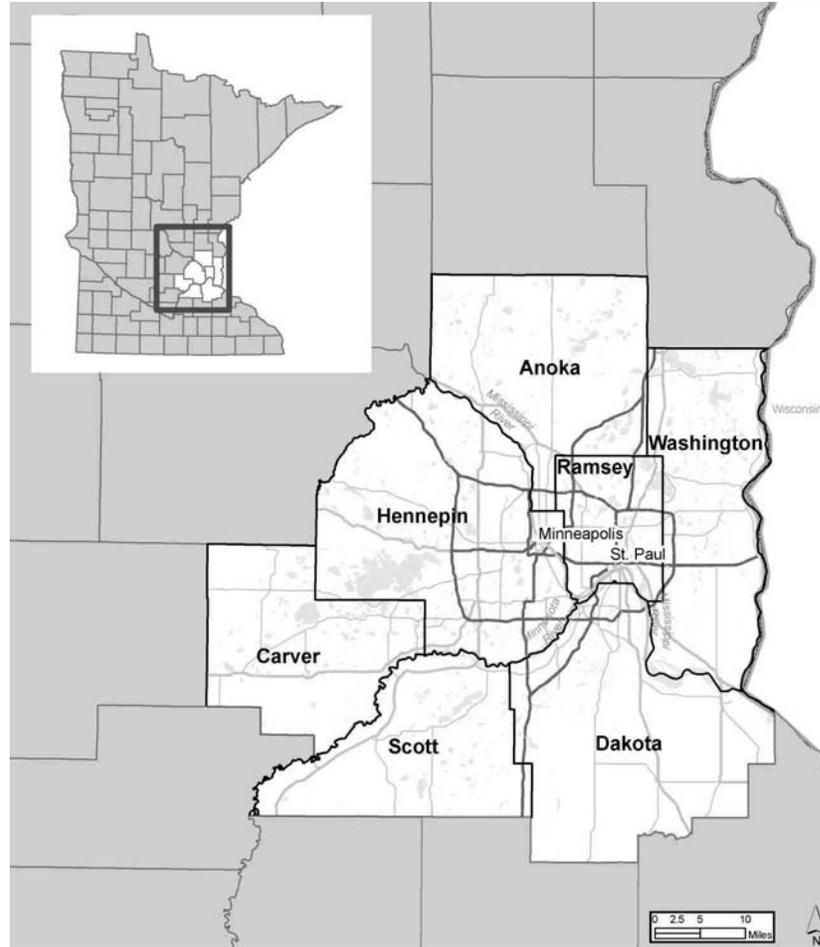


**Figure 4.23 Central Minnesota Region**

Source: Mn/DOT Office of Investment Management

### Seven-County Twin Cities Metropolitan Area Region

While the Greater Minnesota regions play a vital role in the state’s economic performance, the TCMA’s economy serves as the economic hub. The seven county area shown in Figure 4.24 holds a majority of the state’s population (with high levels of educational achievement) and a majority of private sector jobs. These achievements regularly place the Twin Cities at or near the top of national measures ranging from health to education. The region has been characterized by relatively low unemployment rates, below the state and national averages, as well as high levels of labor force participation. Several nationally known leaders in manufacturing, finance, insurance, and business services call this region home.



**Figure 4.24 Seven-County Metropolitan Area Region**

Source: Mn/DOT Office of Investment Management

## **Transportation Implications of Minnesota's Economic Trends**

The following transportation implications of Minnesota's economic trends have been identified:

- Fluctuations in national and statewide economic trends and structural changes in Minnesota's economy require a flexible transportation system capable of shifting with current needs.
- Growth in Minnesota's economy will result in increased travel and shipments of goods. Travel and goods movement will vary regionally.
- Minnesota's high labor force participation rates and projected increases in labor force size will impact the number of transportation system users in general and particularly during peak travel times.
- Appropriate and comprehensive transportation options for the elderly population could increase their impact on and input to Minnesota's economy.

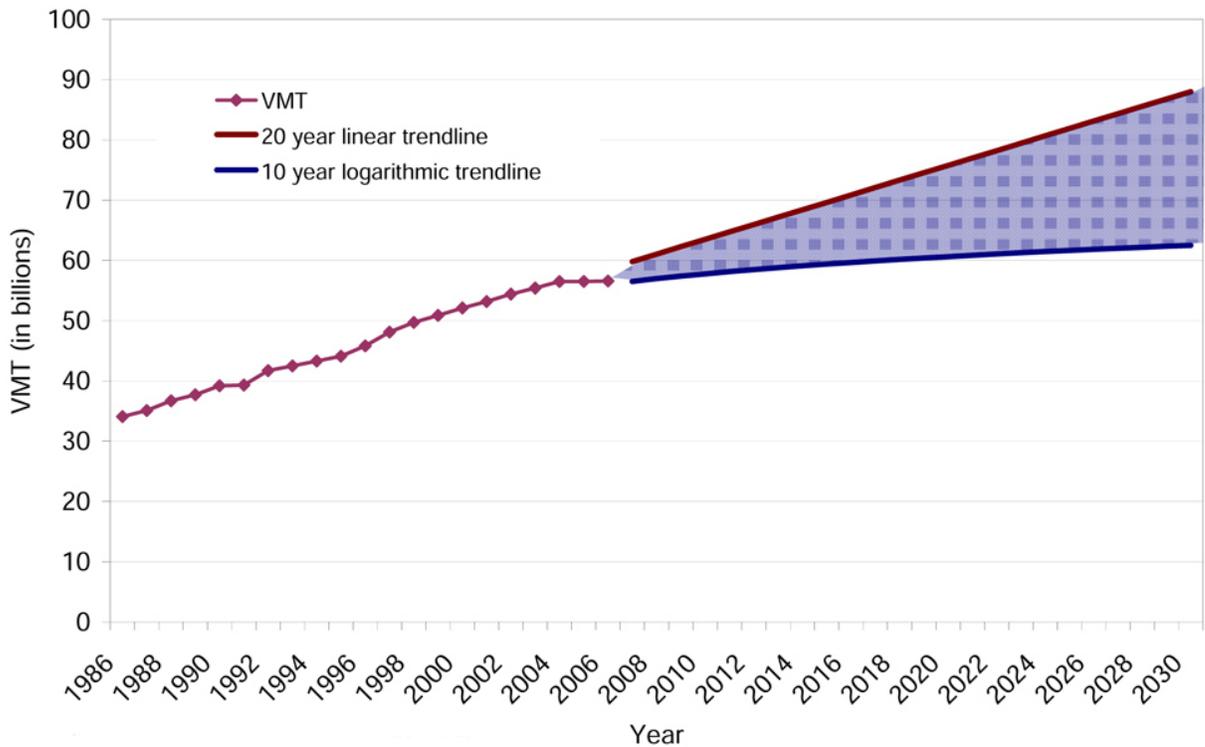
## Travel Trends

Transportation connects people to jobs, shopping opportunities, family, healthcare, and recreation opportunities. Virtually everything Minnesotans do requires some form of transportation infrastructure. Transportation is ubiquitous.

A transportation network like Minnesota’s is affected and shaped by a whole host of factors that determine demands including the size and age of a population, labor force participation, transit ridership, freight movement, and fuel prices to name a few. This section reviews some of the major transportation trends impacting Minnesota.

### Vehicle Miles of Travel Has Leveled

Vehicle miles of travel (VMT) is a measure of how much demand exists on Minnesota’s transportation network. VMT increased year over year for more than two decades until about 2004 when it began to level off<sup>8</sup> (Figure 4.25). Between 1983 and 2003, VMT in Minnesota increased more than 80 percent – about three percent per year.

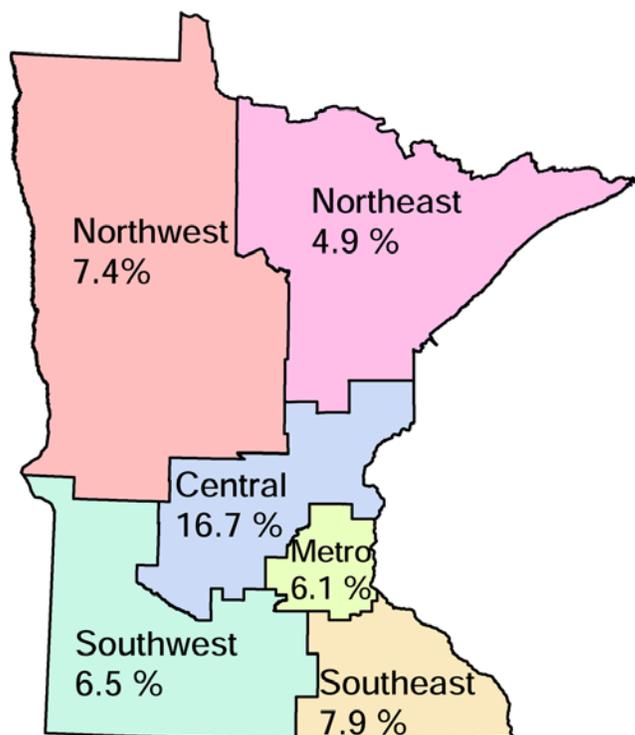


**Figure 4.25 Minnesota Annual Vehicle Miles of Travel (VMT)**

Source: Mn/DOT Office of Investment Management, Transportation Data and Analysis

VMT is sensitive to external factors such as gasoline prices and so it is not known if the current trend will continue or if we will return to pre-2004 growth rates. Some analysts believe that many of the trends contributing to historic VMT increases have now leveled off, such as female labor force participation, household vehicle availability, and household size<sup>9</sup>. Furthermore, high levels of unemployment means there are fewer Minnesotans making daily commutes, which significantly impacts total VMT. Other states are seeing similar trends.

Figure 4.26 shows the percent change in VMT on all streets and highways by region for the period from 2001 to 2007. Notable is the 16.7 percent VMT increase in Central Minnesota where correspondingly high levels of population and employment growth have increased demands on the transportation system.



**Figure 4.26 Percent Change in Vehicle Miles of Travel by Region from 2001 to 2007**

Source: Mn/DOT Office of Transportation Data and Analysis

## State Highways Handle a Majority of Vehicle Miles

In 2007, total VMT in the state was 57.4 billion based on approximately 141,000 miles of roadway. Table 4.4 shows the state highway system carries 58.2 percent of total VMT, but it represents only 8.4 percent of all roadway miles. By contrast, township roads carry just 2.1 percent of the traffic but comprise 41.2 percent of all roadway miles.

**Table 4.4 Minnesota Roadways, 2007 Mile Share and Vehicle Miles of Travel Share**

	VMT (Billions)	Share of VMT (%)	Miles	Share of Miles (%)
<b>State Highways</b>	33.4	58.2	11,883	8.4
<b>County State Aid Highways</b>	12.9	22.4	30,544	21.7
<b>Municipal State Aid Streets</b>	4.5	7.9	3,221	2.3
<b>County Roads</b>	1.0	1.8	14,403	10.2
<b>Township Roads</b>	1.2	2.1	58,166	41.2
<b>City Streets</b>	4.3	7.5	18,800	13.3
<b>Other Roads</b>	0.04	0.1	4,025	2.9
<b>Total</b>	57.4	100.0	14,1042	100.0

Source: Mn/DOT Office of Transportation Data and Analysis

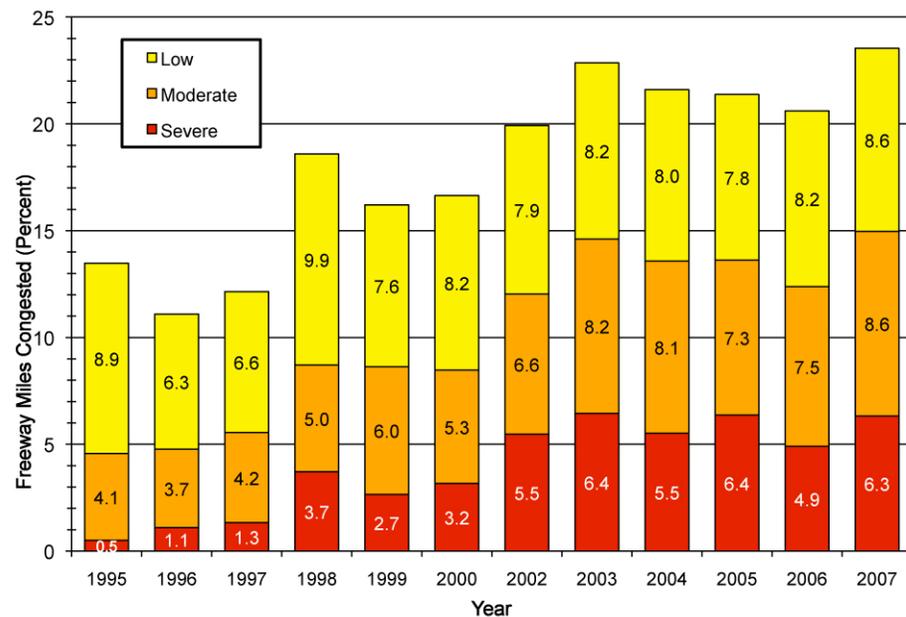
## The Interregional Corridor System Carries a High Proportion of State Highway VMT

Minnesota's Interregional Corridor (IRC) System includes 2,938 miles of roadways that provide statewide and interstate transportation services and connect Minnesota's regional trade centers. This system makes up just two percent of all roadways but carries 27.3 percent of all miles traveled in the state.

## Congestion Is Increasing in the Twin Cities Metropolitan Area

Congestion plays an increasing role in the lives of TCMA residents. Roughly 50 percent of roadway travel in the state occurs on the nine percent of the highway system in this metropolitan area. Several major projects aimed at reducing urban traffic congestion are currently underway in the TCMA, including the I-35W/Trunk Highway 62 Crosstown Commons project and the Unweave the Weave project at I-35E and I-694. Smaller-scale projects are also in progress or have been completed.

Mn/DOT defines congestion as traffic moving below 45 mph in weekday peak periods, i.e., from 6:00 to 9:00 A.M. and from 2:00 to 7:00 P.M. Following several years of progress toward reducing congestion, the percent of the system experiencing congestion increased from 20.6 percent in 2006 to 23.5 percent in 2007. The percent of the Twin Cities' freeway system that is congested and the varying degrees of severity are presented in Figure 4.27. Over time, a greater percent of the congestion has become moderate or severe.



**Figure 4.27 Percent Twin Cities Freeway System Congested**

Source: Mn/DOT Regional Traffic Management Center

Each year, the Texas Transportation Institute issues an Urban Mobility Report through which congestion-related performance measures are presented. One key measure, the Travel Time Index (TTI), is a ratio of travel time in the peak period to travel time in free flow. In 2005, the TCMA's TTI was 1.26, meaning it takes 26 percent longer to travel to a destination during peak travel time than during off-peak travel time.

For this measure, the Twin Cities ranked 26th out of the 85 urban areas analyzed in detail in the report. In 1982, the Twin Cities ranked 55th. Table 4.5 compares the TCMA to other cities of comparable size and geographic proximity.

**Table 4.5 Travel Time Index for Twin Cities and Peer Cities**

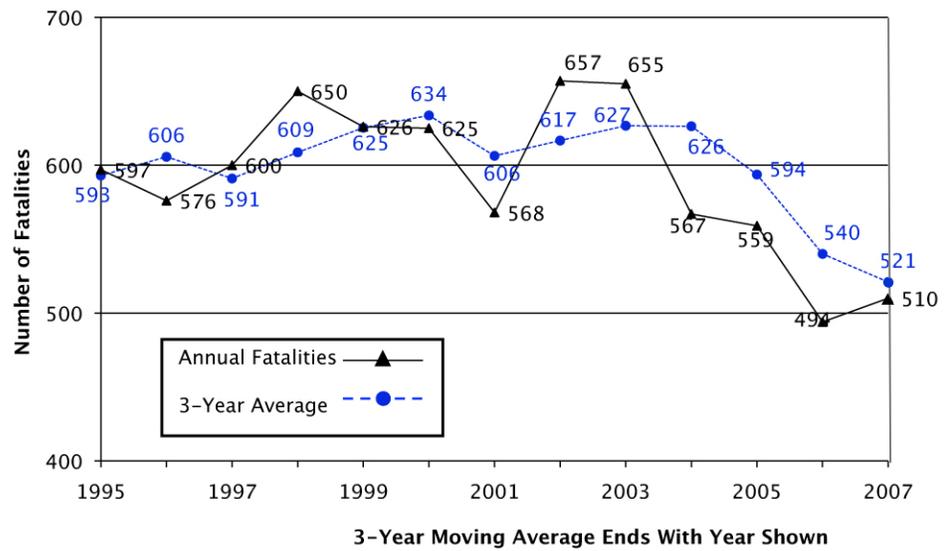
Urban Area	Travel Time Index	
	Value	Rank
Chicago, Illinois	1.47	2
San Diego, California	1.40	4
Denver-Aurora, Colorado	1.33	13
Baltimore, Maryland	1.30	17
Tampa-St. Petersburg, Florida	1.28	23
<b>Minneapolis-Saint Paul, Minnesota</b>	<b>1.26</b>	<b>26</b>
Indianapolis, Indiana	1.22	32
St. Louis, Missouri	1.16	46
Milwaukee, Wisconsin	1.13	53
Kansas City, Missouri/Kansas	1.08	73

Source: Texas Transportation Institute 2007 Urban Mobility Report

## Fatalities Are Decreasing and Fatality Rate Is One of Lowest in Nation

In the early 1970s, annual highway-related deaths numbered 53,000 nationwide. Recognized as a public health crisis, efforts such as increased seatbelt use helped lower the number to 39,000 in the 1990s. However, an alarming trend has emerged since then; deaths have steadily increased, peaking at 43,500 in 2005.

The pattern in Minnesota closely matched the national trend until 2003. Since 2003, the number of traffic-related fatalities has declined; however, nearly 500 fatalities and more than 1,700 serious injuries still occur annually as shown in Figure 4.28).



**Figure 4.28 Minnesota Roadway Fatalities – All State and Local Roads**

Source: Mn/DOT Office of Traffic, Safety, and Technology

In 2006, Minnesota had the second lowest fatality rate in the nation and typically has one of the 10 lowest fatality rates in the nation. Midwestern states in general have fatality rates less than the 1.37 national average as shown in Table 4.6.

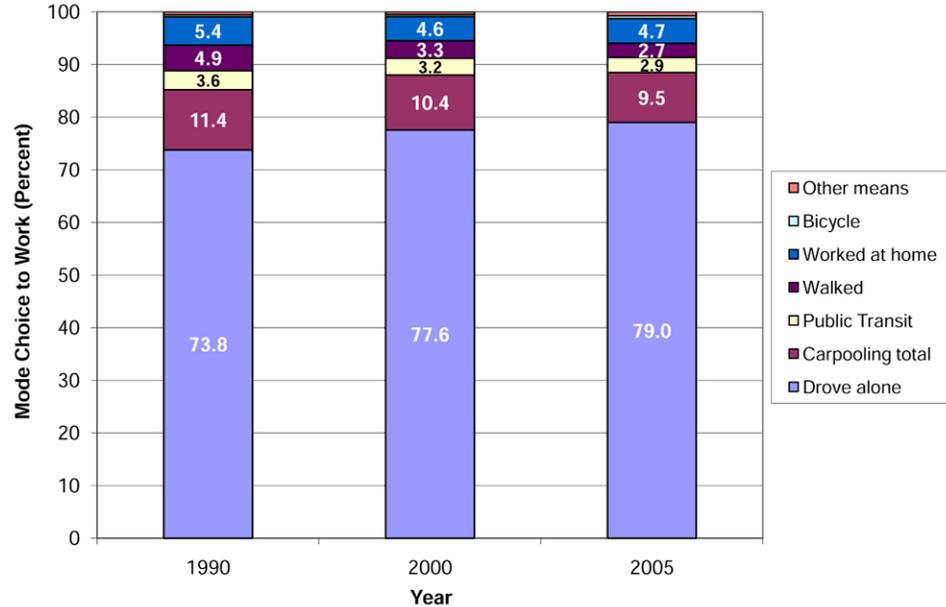
**Table 4.6 Midwest Fatality Rates**

State	Fatality Rate (Fatalities per 100 Million Vehicle Miles Traveled - 2006)	Fatalities (2007)
<b>Minnesota</b>	<b>0.87</b>	<b>510</b>
Michigan	1.04	1088
Illinois	1.17	1,249
Wisconsin	1.22	756
Indiana	1.26	898
Nebraska	1.39	256
Iowa	1.40	445
North Dakota	1.41	111
South Dakota	2.08	146

Source: National Highway Traffic Safety Administration

## Minnesotans Continue to Commute Alone for a Longer Duration

According to 2005 census data, more Minnesotans are traveling alone and by automobile for their journey to work than in 2000. Moreover, a decreasing number of working Minnesotans are carpooling. Figure 4.29 highlights commute-to-work mode changes from 1990 to 2005. Average travel time to work for Minnesotans increased from 21.9 minutes to 22.2 minutes between 2000 and 2005, an increase of 1.3 percent.



**Figure 4.29 Minnesota’s Mode of Transport to Work from 1990 to 2005**

Source: American Community Survey, 2005 Transportation Profile, US Census Bureau

## Household Access to a Vehicle Continues to Increase

A smaller percentage of Minnesota households today have no vehicle available compared to in 2000. Data indicates that 6.7 percent of Minnesota households had no vehicle available to them in 2007 compared to 7.7 percent with no vehicle available in 2000. Household vehicle ownership in 2007 was at 1.85 vehicles per household in Minnesota compared to 1.77 in 1990. Meanwhile, household size (the number of persons per household) has decreased since 1990 – the average household size was 2.45 persons in 2007, 2.52 in 2000, and 2.58 persons in 1990.

The Minnesota Department of Public Safety reports that in 2007 there were 4.8 million registered vehicles in the state compared to 4.2 million in 2000 and 3.52 million in 1990.

## Single Occupant Vehicles Account for Large Percentage of All Trips

According to the Metropolitan Council's 2000 Travel Behavior Inventory, 71.5 percent of all vehicle trips in the TCMA are made in single-occupant vehicles. Furthermore, the average passenger-vehicle occupancy for all trip purposes is 1.35 persons. The passenger-vehicle occupancy for home-based work trips<sup>10</sup> is 1.05. Table 4.7 presents additional vehicle occupancy rates for Minnesota. This information will be updated in 2010 for the TCMA as part of the Metropolitan Council's Travel Behavior Inventory survey.

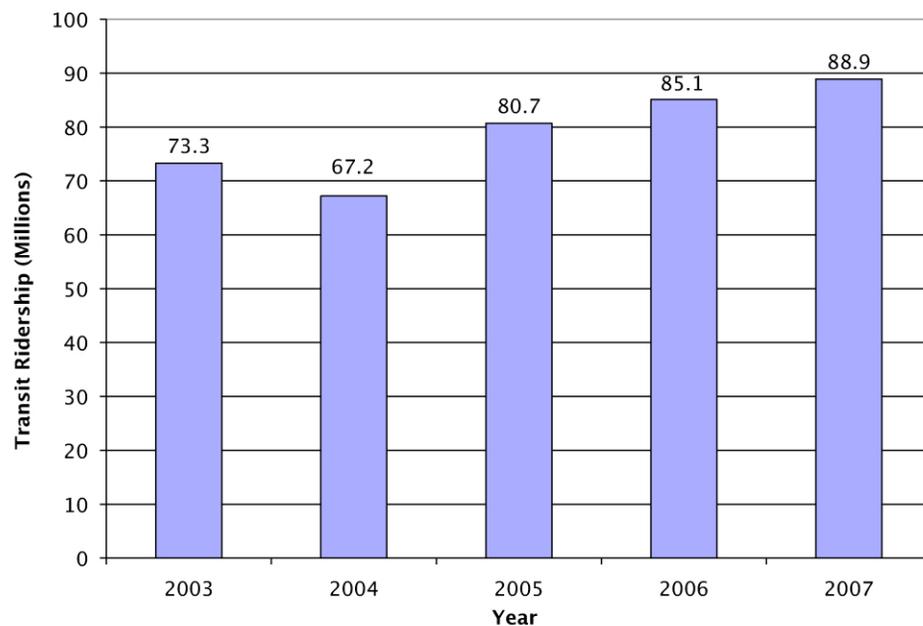
**Table 4.7 Minnesota Automobile Occupancy Rates**

	Off-Peak	Peak	Daily
<b>Seven-County Metropolitan Area</b>	1.43	1.28	1.35
<b>Urban Areas</b>	1.46	1.47	1.46
<b>Rural Areas</b>	1.60	1.36	1.49

Source: Metropolitan Council's 2000 Travel Behavior Inventory, 2001/2002 National Household Travel Survey (NHTS)

## Transit Ridership and Availability Is Increasing

The transit system that serves the TCMA region continues to mature and grow with new technologies such as Light Rail Transit (LRT); however, buses continue to carry the bulk of passengers. In 2007, Metro Transit recorded the highest transit ridership since 1982 (Figure 4.30).



**Figure 4.30 Regional Transit Ridership from 2003 to 2007**

Source: Metropolitan Council

Public transportation service in Greater Minnesota is varied. The number of transit systems and areas served has changed significantly over the past 15 years as new systems are being added while others are being contracted.

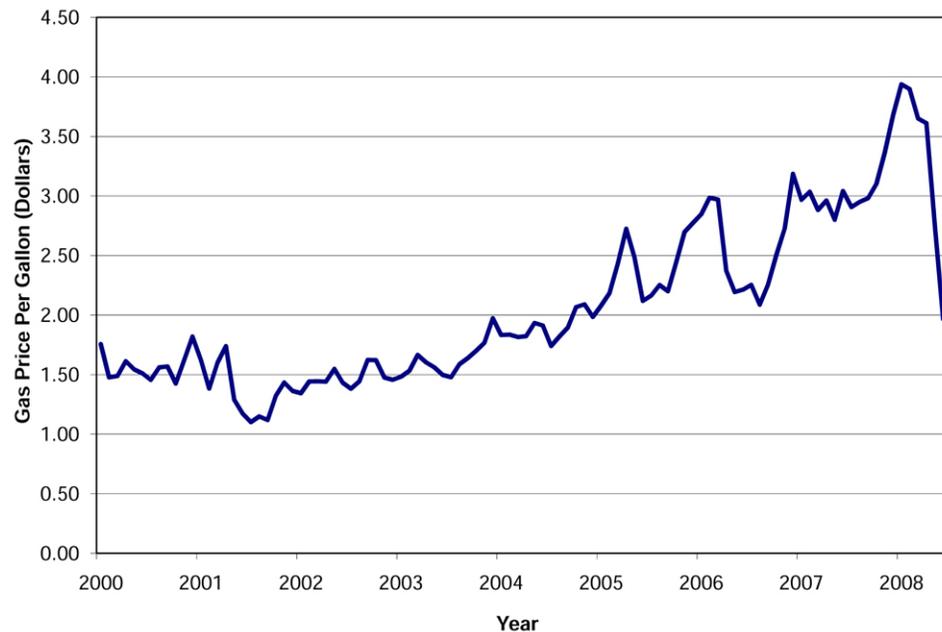
In 1990, public transportation was available in only 59 counties in Greater Minnesota. By 1998, there was transit service operating in 73 counties providing nearly 9 million rides. The total operating cost for those services was about \$30 million using a fleet of just under 500 vehicles. By 2002, the total fleet had grown to 529 vehicles with over 16 million vehicle miles of service operated. The total operating cost in 2002 was about \$37 million and some 9.1 million passengers were transported.

As of 2005, there were 66 public transit systems operating in Greater Minnesota. These services operated over 14 million miles of service providing over 9.3 million rides per year using a fleet of just over 500 vehicles. A total of 73 counties in Greater Minnesota had some level of public transit.

### Fuel Costs Are Volatile and Unpredictable

Petroleum is used to produce a number of fuel products vital to the transportation industry including gasoline, diesel and jet fuel. As such, the transportation sector is responsible for 72 percent of petroleum consumption<sup>11</sup>.

The volatility and unpredictability of gasoline will likely continue to have an impact on Minnesotans' travel behavior despite a proliferation of smaller more fuel efficient, and alternative fuel automobiles. In 2007, average fuel prices in Minnesota approached an unprecedented \$4.00 per gallon while many paid more. However, by the end of 2008 the average price of gasoline had fallen back below \$2.00 per gallon (Figure 4.31).

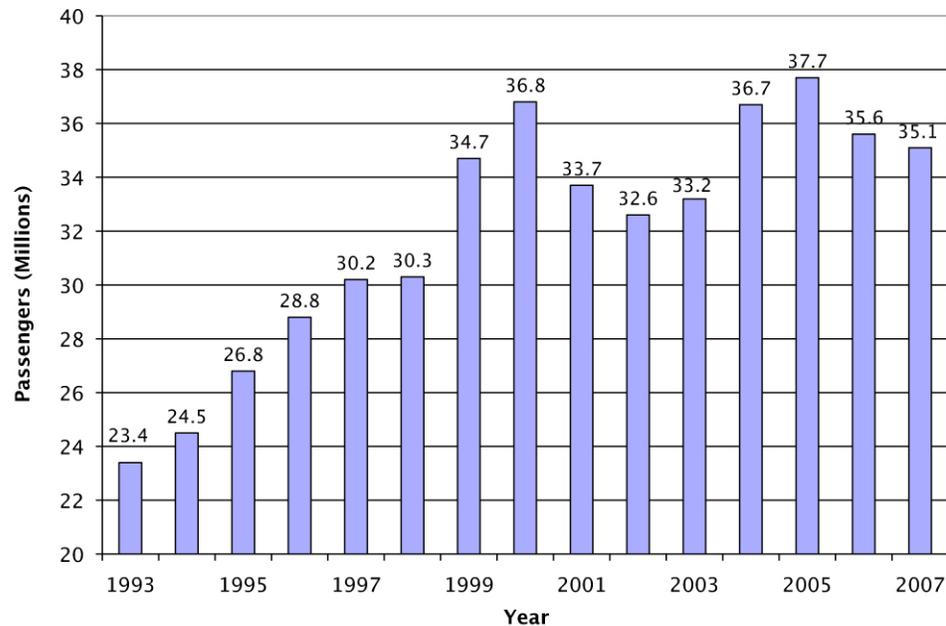


**Figure 4.31 Minnesota Gasoline Prices from 2000 to 2008**

Source: Energy Information Administration

## Air Travel Is Fluctuating Statewide but the Long-Term Trend Is Upward at the Minneapolis-St. Paul International Airport

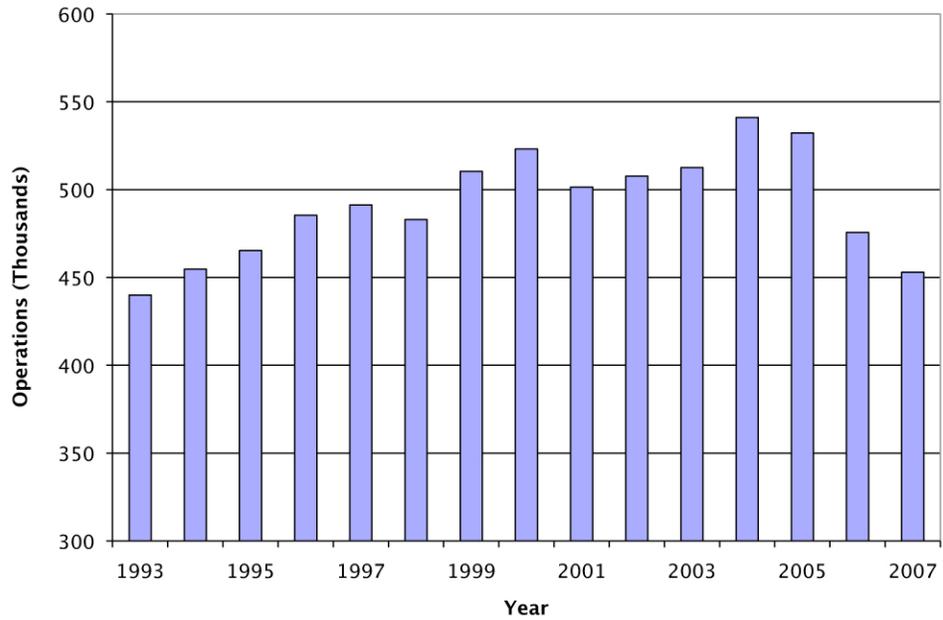
MSP was ranked as the 14th busiest airport in the U.S. in 2007 and the 26th in the world in terms of number of passengers served annually.<sup>12</sup> Total passengers are defined as arriving passengers plus departing passengers, with passengers on connecting flights counted only once. MSP accommodated more than 35 million passengers in 2007. Passenger volume has declined slightly from its peak of 37.7 passengers in 2005 (Figure 4.32).



**Figure 4.32 MSP Annual Passengers from 1993 to 2007**

Source: Metropolitan Airports Commission

According to the Metropolitan Airports Commission, the Minneapolis-St. Paul International Airport (MSP) had more than 452,972 operations (take-offs and landings) in 2007, which is a decrease of 4.6 percent from 2006 (Figure 4.33). The decrease is reflective of high air fares and efforts made by the airlines to reduce costs by filling more seats per flight.

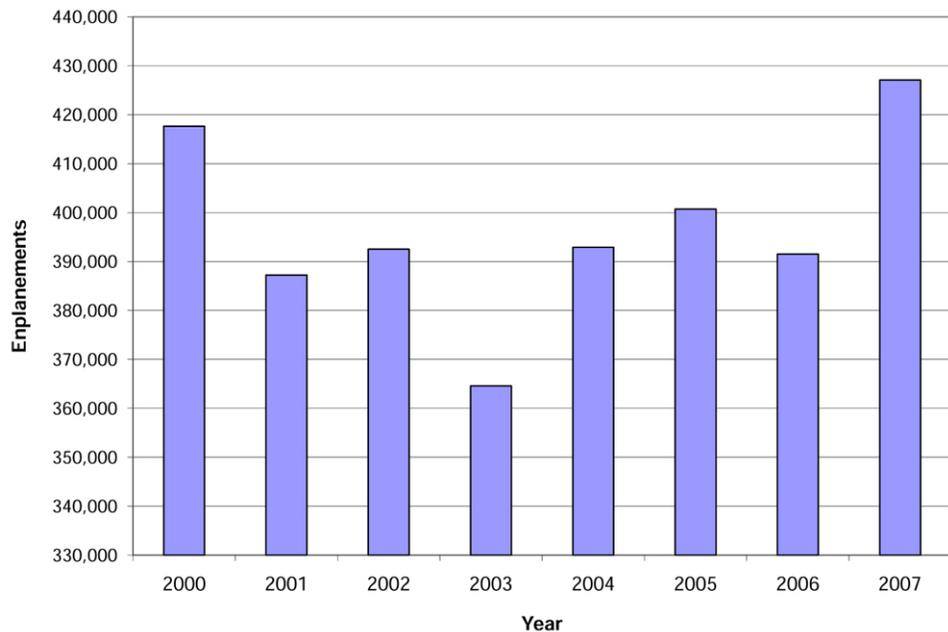


**Figure 4.33 MSP Annual Operations from 1993 to 2007**

Source: Metropolitan Airports Commission

Air travel is also fluctuating in Greater Minnesota. Eight of Minnesota’s nine commercial service airports are in Greater Minnesota cities, including Bemidji, Brainerd, Duluth, Hibbing, International Falls, Rochester, St. Cloud, and Thief River Falls.

Total enplanements at these airports in 2007 were 427,109. Enplaned passengers are those originating and connecting at a particular airport. Figure 4.34 highlights the fluctuations in enplanements seen at Greater Minnesota airports.



**Figure 4.34 Greater Minnesota Enplanements from 2000 to 2007**

Source: FAA, Mn/DOT Office of Aeronautics

## Freight Flows and Goods Movements Have Increased

In 2005, Mn/DOT completed its first Statewide Freight Plan, which looked comprehensively at the movement of freight in Minnesota by trucks on the roadways, trains on the railways, ships and barges on the waterways, and airplanes in the skies. Freight movement is essential for Minnesota's estimated 9,000 manufacturers, 28,000 retail stores, 15,000 wholesale trade companies, and 3,000 agricultural businesses. Together, these industries employ nearly 50 percent of the state's workers.

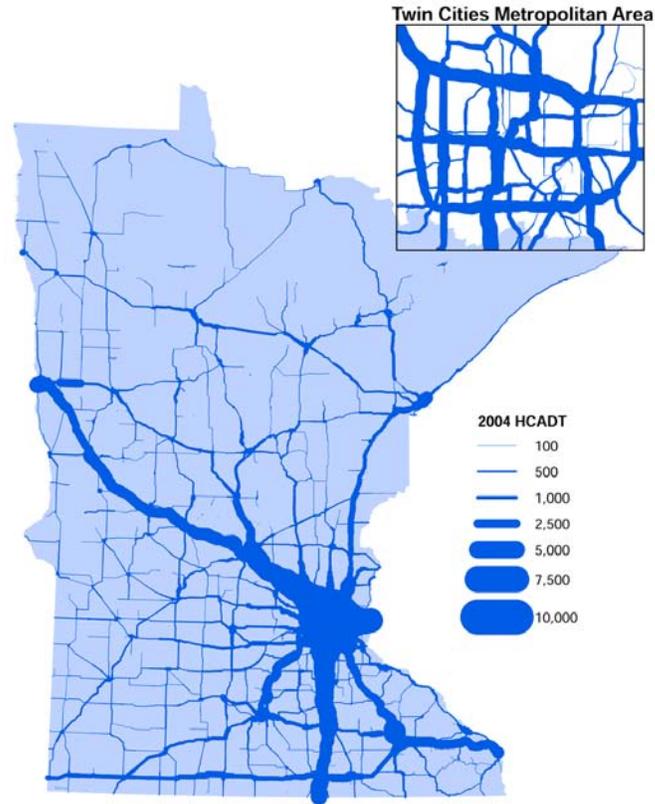
In 2001, more than 636 million tons of freight moved in and through Minnesota with a value of \$562 billion, an amount equivalent to 129 tons and \$114,000 per resident. This is projected to grow to 1,019 million tons (60 percent increase) and an almost \$1.2 billion in value (108 percent increase) by 2020. Minnesota's freight is carried by a balance of several modes. Table 4.8 shows the distribution of freight tonnage and value by mode in 2001.

**Table 4.8 Freight Mode by Weight/Value, 2001**

Mode	Weight (%)	Value (%)
Truck	59	79
Rail	33	14
Water	8	1
Air	<1	6

*Source: Mn/DOT Office of Freight and Commercial Vehicle Operations*

Trucks account for 59 percent of freight movement by tonnage and 79 percent by value in the state. Their movement necessitates use of the full range of road networks, from local roads to federal highways. Although truck traffic has grown at a slightly faster rate than Minnesota's overall VMT, the Heavy Commercial VMT (a measure of truck flows) as a percent of total VMT has remained roughly the same over the past decade. Figure 4.35 displays truck traffic volumes across Minnesota. The TCMA and Interregional Corridor (IRC) System have the busiest routes.



**Figure 4.35 2004 Heavy Commercial Vehicle Average Daily Traffic Volumes (HCADT)**

*Source: Mn/DOT Office of Transportation Data and Analysis*

The rail network in Minnesota is also important for moving heavy bulk goods and a variety of commodities and rail accounted for 33 percent of freight movement by tonnage and 14 percent by value in the state in 2001. The railroads haul rail freight in Minnesota on approximately 4,526 miles of track. Minnesota is seeing more 100+ car shuttle trains, which focus on long-hauls and are increasingly affected by rail bottlenecks in Chicago.

## Implications of Minnesota's Transportation Trends

- The leveling off of Vehicle Miles of Travel is an important but not yet fully understood phenomenon. It has potential long-term implications for congestion, safety, and gas tax revenue.
- Congestion in the Twin Cities and other urban areas is projected to grow due to increases in population and commuting distances.
- Projected increases in freight flows and goods movement may result in increased traffic congestion and vehicles mile of travel.
- Volatility in fuel prices will continue to impact Minnesotan's travel behavior as well as freight mode choice and movements. Fuel prices play an increasingly important role in household decision-making as transportation costs threaten to gain an increasing share of household expenditures.

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<sup>1</sup> All population projections produced using Minnesota State Demographic Center data.

<sup>2</sup> The Department of Homeland Security defines legal permanent residents (LPRs) as foreign nationals who have been granted the right to reside permanently in the United States. LPRs are often also referred to as immigrants, permanent resident aliens, and green card holders.

<sup>3</sup> *Minnesota Economic Trends*, MN Department of Employment and Economic Development August 2006, (<http://www.deed.state.mn.us/lmi/publications/trends/0806/micro.htm>).

<sup>4</sup> Tom Stinson and R. Gillaspay, "The Economics of Minnesota's Ruralplexes," *Rural Minnesota Journal*, University of Minnesota Center for Rural Policy and Development, January 2006.

<sup>5</sup> *Minnesota's Economy: A Closer Look at Recent Job Trends: A Summary of Analysis and Discussions Between DEED, DOR, DOF and DOA*, Minnesota Department of Employment and Economic Development, March 2008.

<sup>6</sup> *Minnesota Labor Force Projections 2000 to 2030*, Minnesota State Demographic Center, February 2003.

<sup>7</sup> *Minnesota Economic Trends*, Minnesota Department of Employment and Economic Development, December 2007, (<http://www.deed.state.mn.us/lmi/publications/trends/1207.htm>).

<sup>8</sup> In 2008 an adjustment was made in the way Minnesota's road mileage was calculated leading to the addition of about 5,000 centerline miles to the system. VMT data has been normalized to avoid what would otherwise have masked the .02 percent decrease in VMT from 2006 to 2007.

<sup>9</sup> *Travel Monitoring Brief*. U.S. Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, August 2008.

<sup>10</sup> Any trip that has home at one end and work at the other.

<sup>11</sup> Energy Information Administration, U.S. Department of Energy.

<sup>12</sup> *Information Brief*, Airports Council International, July 2008.



# Chapter 5:

## Minnesota Transportation Funding

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*Public transportation funding is appropriated to specific modes and is generally not transferable between the modes.*

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Transportation investments have been one of the top issues for the State of Minnesota and the nation for many years. Despite the increases in transportation funding over the last 20 years, the challenge of meeting the growing needs for transportation investments continues to be an issue. This chapter will describe the sources of public revenues for transportation in Minnesota, historical trends in revenues and costs and their projections, and the innovative funding tools available.

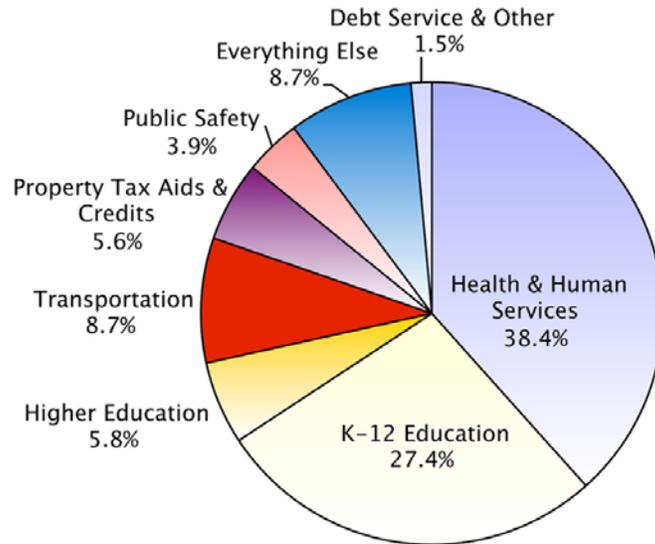
Public transportation funding is appropriated to specific modes and is generally not transferable between the modes. The following discussion is organized by mode. The main focus of this chapter is the funding for the statewide highways and the transit systems, with a brief overview of public funding for aeronautics, railroads, and waterways.

### Transportation Expenditures in Minnesota

In 2005, \$3.37 billion was spent on highway and transit capital and maintenance improvements in Minnesota by all public agencies<sup>1</sup>. This was about 1.52 percent of the Minnesota State Gross Product — a measure of the total income for the state. Although total transportation expenditures have increased over time, as a share of the gross state product they have declined since 1990, suggesting that transportation investments have not kept pace with growth of the economy.

At the end of the 2007 Legislative session, the Minnesota state operating budget was expected to be \$55.93 billion for the 2008-2009 biennium (July 1, 2007 to June 30, 2009). This was based on the projected tax and user fee revenue collections. The level of funding appropriated may change during the biennium to reflect current circumstances.

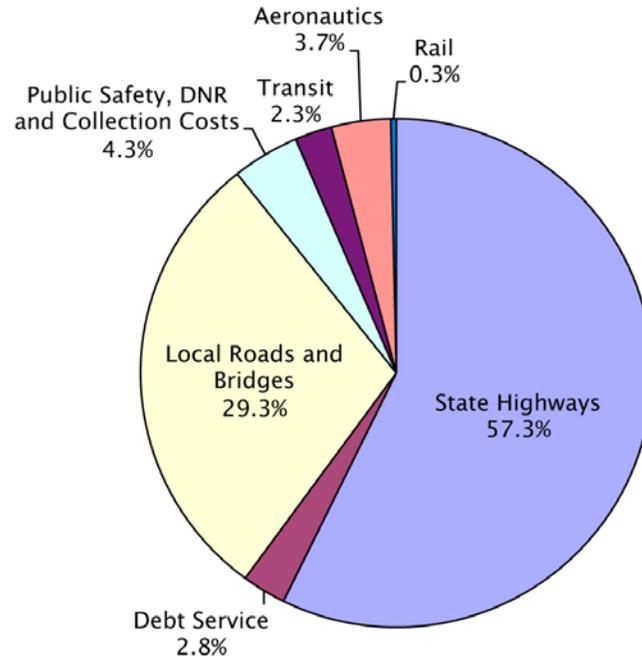
Transportation accounted for 8.7 percent or nearly \$4.8 billion of the state biennium operating budget. Typically, transportation expenditures range from seven to nine percent of the state budget. Figure 5.1 shows the share of the state transportation expenditures in relation to all the other state programs for the 2008-2009 biennium. Transportation is the third largest state program in Minnesota after health and human services and education.



**Figure 5.1 Minnesota Total Appropriated State Expenditures, All Funds 2008 to 2009 Biennium (\$55.39 billion)**

Source: *Minnesota Management and Budget*

The largest share of the state transportation expenditures are for roads and bridges. For example, in SFY 2007 road and bridge expenditures accounted for 86.6 percent of the total state transportation expenditure, as shown in Figure 5.2.



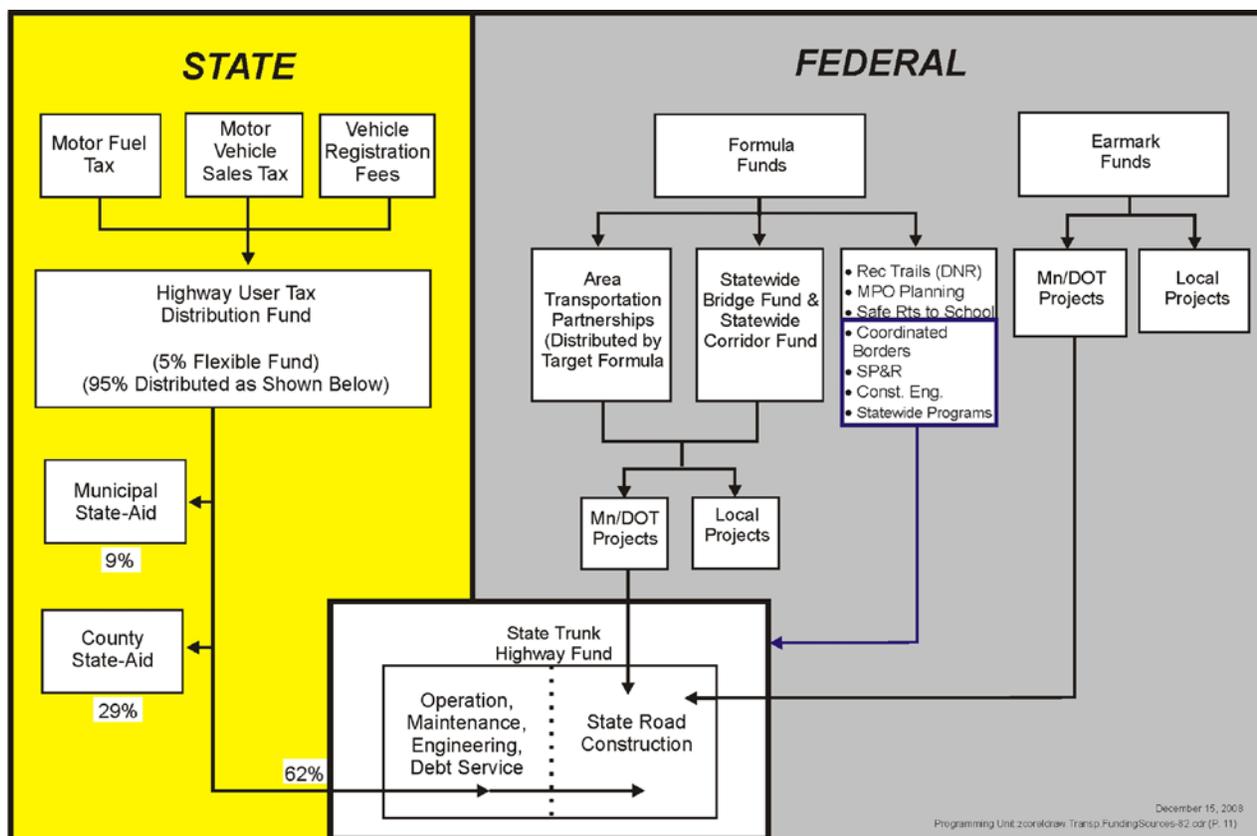
**Figure 5.2 Minnesota State Transportation Expenditures by Type for SFY 2007 (\$2.4 billion)**

Source: *Mn/DOT Office of Finance*

The state budget does not include expenditures by local agencies from local revenue sources. In 2004, an estimated \$1 billion were spent by local governments on roads and streets from local sources<sup>2</sup>. Transportation expenditures of the Twin Cities Metropolitan Council are also excluded from the state expenditures.

## Minnesota Highway Revenue Sources

Highways are funded by state and federal revenues that are raised through taxes and user fees. Figure 5.3 illustrates the flow of revenue for state transportation investments.



**Figure 5.3 Minnesota's Primary Transportation Funding Sources for State Highways**

Source: Mn/DOT Office of Investment Management

## State Revenue Sources

As depicted in Figure 5.3, the regular state revenue sources for transportation are the Motor Vehicle Fuel Tax (MVFT), Motor Vehicle Registration Tax and Fees (tab fee), and the Motor Vehicle Sales Tax (MVST). In SFY 2007, these three sources raised approximately \$1.29 billion in revenues. The MVFT raised 50 percent of the total revenues, the tab fee raised 38 percent, and the MVST raised 12 percent.

Highway improvements may also be funded by bonding. Bonding, which must be authorized by the State Legislature, is actually a financing approach, not a primary source of revenues. Bond financing can be used to advance construction of projects to

an earlier time period than would be feasible under the pay-as-you-go approach. The bonds are then paid through future revenues, typically over a 20-year period. This type of financing helps to avoid inflationary construction cost increases and generates road user benefits earlier.

The state transportation revenues are deposited in the Highway User Tax Distribution (HUTD) Fund. After withholdings for administrative costs, the Department of Natural Resources (DNR), and five percent for the Flexible Fund, the remaining revenues are constitutionally distributed among the State Trunk Highway Fund (62 percent), the County State Aid Fund (29 percent), and the Municipal State Aid Fund for cities with populations greater than 5,000 (nine percent).

The State Trunk Highway Fund is managed by Mn/DOT for investments on the state highway system and supports four general types of expenditures:

- Highway Operations and Maintenance including traffic management, snow removal, pavement patching, etc.
- Engineering Services including planning, design, and project delivery for state highway improvements
- Debt Service on bonds
- State Road Construction, including the state highway capital program for new construction and reconstruction of highways and bridges

## Federal Revenue Sources

The revenue raised by the federal Motor Vehicle Fuel Tax and other fees is collected in the Federal Highway Trust Fund. It is then distributed to the Federal Highway Account, the Federal Transit Account, and other federal transportation accounts. Funds from the Federal Highway Account are distributed to the states for use on both eligible state and local highways. Minnesota receives federal funds in three ways: formula funds (apportioned), discretionary programs (allocated), and earmark funds.

## Federal Formula Funds

The federal formula funds are apportioned to states based on factors such as the size and usage of the system and the state contribution to the Federal Highway Account. Federal formula funds are further distributed as follows.

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*The largest proportion of the federal formula funds is distributed among the eight ATPs.*

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First, a portion of the federal formula funds is assigned to specially designated federal programs administered by Mn/DOT or other agencies such as the Safe Routes to School Program, the DNR Recreational Trails program, and the Metropolitan Planning Program.

Next, formula funds are allocated to the Statewide Bridge and Corridor Program. This program was created to assist in funding larger bridge and corridor improvement projects that a single Mn/DOT District or Area Transportation Partnership (ATPs) would otherwise have difficulty funding with its regular targeted share of federal funds.

The remainder, and largest proportion of the federal formula funds, is distributed among the eight ATPs based on a target formula. The target formula is based on the ATP's share of statewide infrastructure preservation needs (60 percent), safety needs (10 percent) and mobility needs (30 percent). Each ATP includes a Mn/DOT District and various local transportation partners, such as Metropolitan Planning Organizations (MPOs) and Regional Development Commissions (RDCs) as well as transit/modal, county, city, and tribal government representatives. The ATPs integrate the state and local priorities for federal funding within their regions and determine the division of federal funding between Mn/DOT and local governments. On average, about two thirds of the federal funding is programmed for state highways, but this can vary between ATPs and over time.

### **Federal Discretionary and Earmark Funds**

Discretionary funds and earmarks are distributed by congressional designation or through a competitive process. For example, in 2008, Mn/DOT was awarded \$133.3 million through the U.S. Department of Transportation's Urban Partnership Agreement program to implement innovative strategies to improve mobility on the I-35W corridor in the Twin Cities.

## **Trends in Minnesota Highway Revenues and Costs from 1990 to 2007**

### **State Revenue Trends**

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*The growth in transportation revenues slowed significantly from 2000 to 2007.*

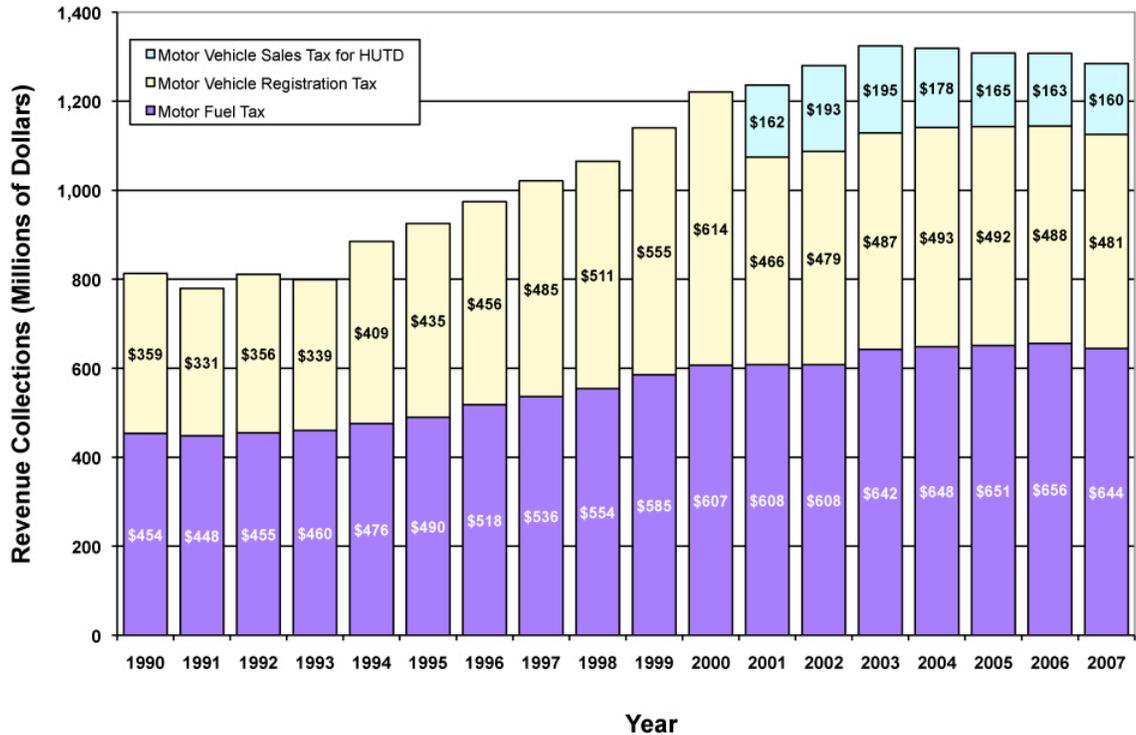
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The state highway revenue collections increased at an average annual rate of 2.7 percent between the years 1990 to 2007. The 1990 to 2000 decade was a period of high growth for all revenue sources. However, this growth slowed significantly from 2000 onward as illustrated in Figure 5.4, which shows the HUTD fund revenue collection for the period 1990 to 2007.

From 1990 to 2000, the increase in revenue collections coincided with a period of high economic growth. The expanding global economy kept inflation low and employment high, with Minnesota performing better than the U.S. economy. The increase in incomes and population resulted in an increase in the purchase of new vehicles and travel. Stable and low world oil prices encouraged the purchase of large, less fuel efficient vehicles, further increasing the motor fuel and registration tax revenues.

Between 2000 and 2007, however, state transportation revenues grew by less than 1 percent per year. For the first five years HUTD fund revenues increased by 1.8 percent. During the last two years, 2006 and 2007, each of the HUTD fund revenues experienced declines in collections.

The U.S. economy experienced a short recession in 2001. Minnesota's economy did not rebound to the growth rates previously experienced.



**Figure 5.4 Trends in Minnesota’s Primary Transportation Revenue Sources**

Source: Minnesota Management and Budget

### State Motor Vehicle Fuel Tax

*High fuel prices have reduced travel and caused a shift toward more fuel efficient vehicles, resulting in a reduction in fuel tax revenues.*

Revenues from the state’s Motor Vehicle Fuel Tax increased at an annual average rate of three percent from 1990 to 2000. Beginning in 2001, the growth in world economies, particularly China and India, increased the demand for oil, causing world oil prices to increase. The initial increases in oil price did not significantly impact demand for travel. However, the continued increase in world demand for oil, without a significant increase in supply, caused world oil demand to approach the world oil supply. Since 2005, any risk of shocks to the supply of oil has caused oil prices to increase rapidly. The increasing oil prices from 2005 onward reduced the demand for travel and caused a shift toward the purchase of more fuel efficient vehicles, reducing fuel consumption and hence motor fuel tax revenues.

### Motor Vehicle Registration Tax

The Motor Vehicle Registration Tax (tab fee) grew at annual average rate of more than five percent from 1990 to 2000. The growth in revenues was particularly strong in the latter half of the period as is evident in Figure 5.4.

Revenue from the tab fee was effectively reduced in 2000 when the depreciation schedule was changed so that the tax was only based on the value of the vehicle in the first year. In subsequent years, the amount of tax paid was capped.

## Motor Vehicle Sales Tax

Prior to the year 2000, the MVST was all deposited in the State General Fund. In 2000, to compensate for the loss of revenue from the cap on tab fees, the Legislature statutorily directed that 30 percent of the MVST revenue be deposited in the HUTD fund. This shift from tab fees to MVST resulted in revenue being more dependent on the purchase of new vehicles.

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*Revenues from the MVST peaked in 2003 at \$195 million and have decreased every year since at an average annual rate of 5 percent.*

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Just as a portion of the MVST was directed to fund highways, its value as a revenue source began to diminish. The MVST had experienced an annual average growth rate of 6.8 percent from 1990 to 2000, a period of strong economic growth. However, the demand for new vehicles has never fully recovered following the recession of 2001. Revenues from the MVST peaked in 2003 at \$195 million and have decreased every year since at an average annual rate of 5 percent.

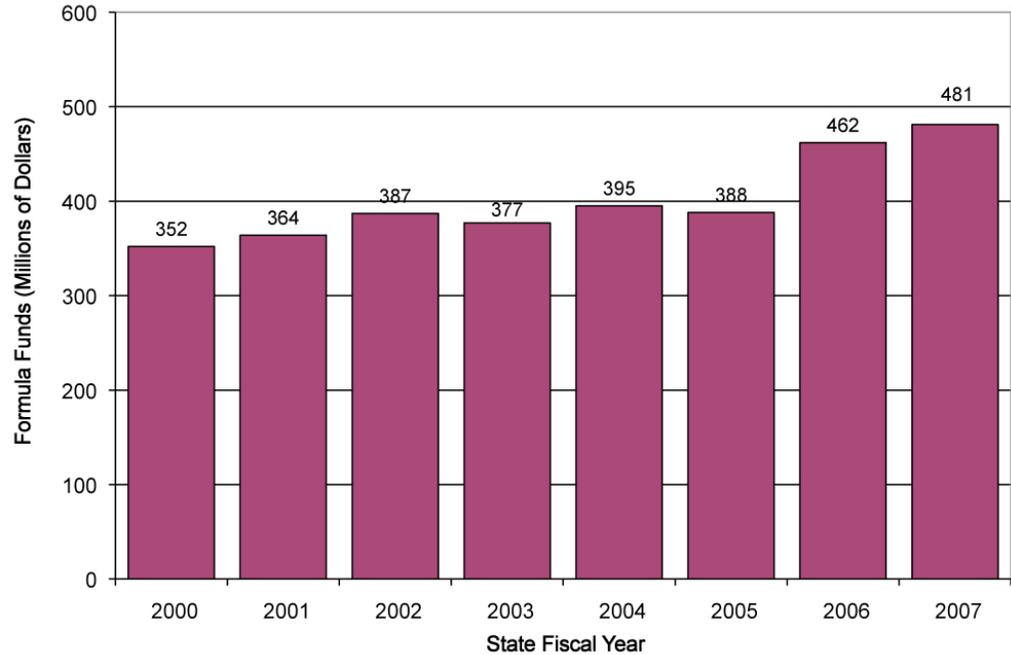
In November 2006, Minnesota voters passed a constitutional amendment that dedicated 100 percent of the MVST to transportation, phased in over a five-year period. The amendment specified that up to 60 percent of the MVST would be dedicated to highways (the HUTD fund) and at least 40 percent to transit.

## The Bond Accelerated Program

In June 2003, the Minnesota State Legislature adopted legislation authorizing millions of dollars in bonding to accelerate the delivery of transportation projects. The Bond Accelerated Program (BAP) provided innovative financing of over \$900 million for highway and transit projects. The BAP consisted of \$400 million in state bonds, \$425 million in federal advanced construction<sup>3</sup> funds, and \$100 million in state highway funds. The \$400 million in bonds allowed Mn/DOT to leverage approximately \$425 million of federal advance construction funds. The 20-year bonds were repaid with \$36 million each year from internal Mn/DOT budget savings. The \$100 million state funds came from spending down the State Trunk Highway Fund balance over 2004 to 2007.

## Federal Revenue Trends

From 1990 to 2007, federal revenues for highways generally increased. This can be attributed to increased funding levels in the federal funding bills. Figure 5.5 shows the federal formula funds received by Minnesota for highway investments since 2000. This is the period for which a consistent series of data is available.



**Figure 5.5 Federal Formula Funds for Highway Investments**

Source: Mn/DOT Office of Investment Management

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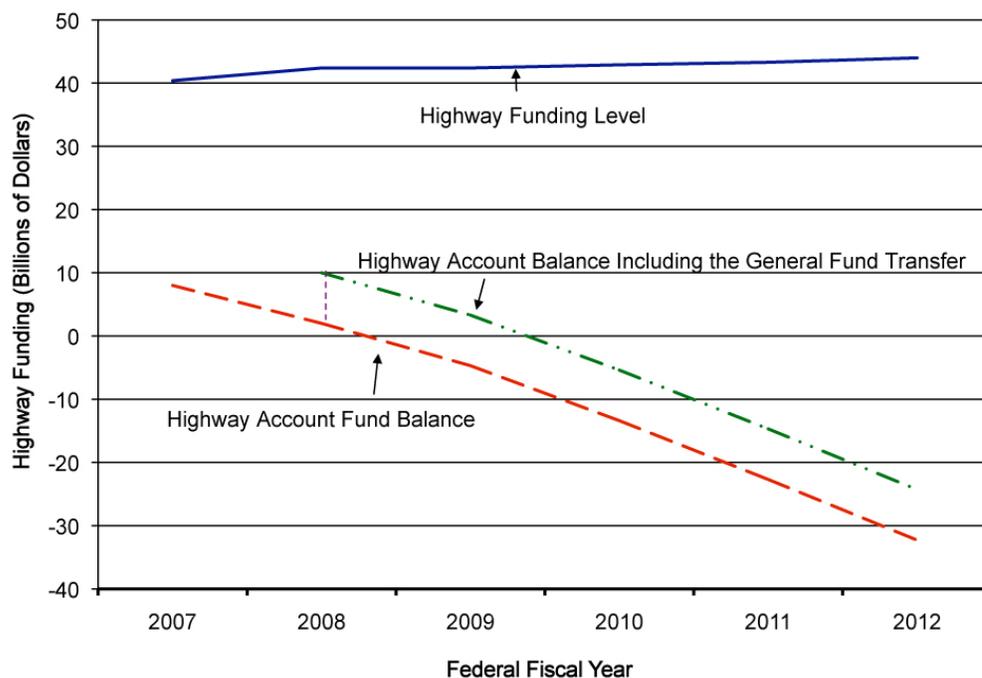
*The allocation of gasohol tax revenues changed Minnesota’s federal revenue allocation beginning in 2006.*

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The Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) federal funding bill passed in 2005 significantly increased funding for highways. This was done in two ways. First, there was a change in the way taxes from gasohol (a blend of gasoline and ethanol) are distributed between the Highway Account and the Transit Account. The allocation of gasohol tax revenues was changed under SAFETEA-LU such that the Highway Account received more money from taxes on gasohol than it did under the previous funding bills. This particularly benefited Minnesota as gasohol is mandated to be used in the state. The new distribution increased Minnesota’s contribution to the Highway Account, resulting in increased federal formula funds for Minnesota. Second, Congress authorized increased federal funding to be supported by spending down accumulated balances in the Federal Highway Trust Fund.

*The Federal Highway Trust Fund balance is declining and likely to be in deficit before 2011.*

While SAFETEA-LU authorized more funding for transportation, federal motor fuel tax growth has been limited. Federal motor fuel tax is the main source of revenue for the Highway Trust Fund and hence the Highway Account. A decline in the growth rate of vehicle miles traveled has reduced the rate of increase in revenues deposited in the Highway Account. To continue meeting the funding levels authorized under SAFETEA-LU, the Highway Account fund balance is projected to become negative in federal fiscal year 2009 (October 2008 to September 2009) and into the future, as shown in Figure 5.6. In the fall of 2008, Congress added \$8 billion to the Highway Account to support funding levels of the SAFETEA-LU bill. This is a short-term fix, as the Highway Account is expected to be negative again before 2011. Additional congressional action will be required to maintain the current level of funding.

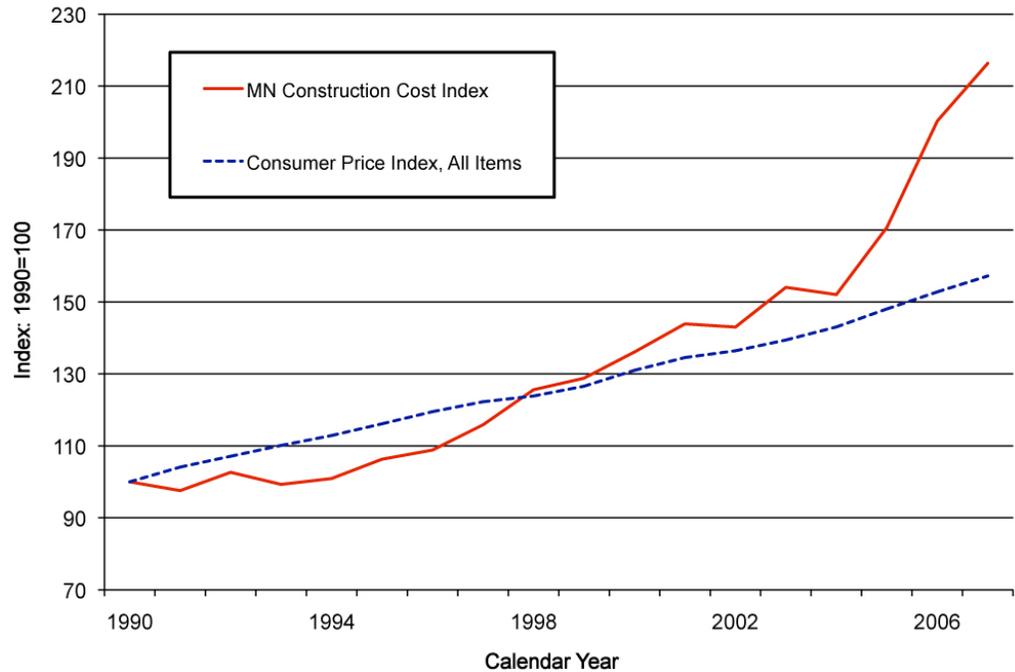


**Figure 5.6 Federal Highway Trust Fund Highway Account**

Source: Office of U.S. Management and Budget (OMB), Winter FY 2009 Projection

## Highway Construction Cost Trends

Over the period from 1990 to 2007, highway construction costs have increased at an average annual rate of 4.6 percent with record level increases since 2004. The recent spike in construction costs is largely attributable to an increase in prices of construction materials such as bituminous, steel, and cement, which are affected by a growing demand worldwide. The sharp cost increases since 2004, averaging at 12 percent per year, have been driven by high oil prices. Figure 5.7 compares increases in the highway construction cost index and the consumer prices index, illustrating the divergence between the increases in general inflation and highway construction costs.



**Figure 5.7 Highway Construction Cost and Consumer Price Indices**

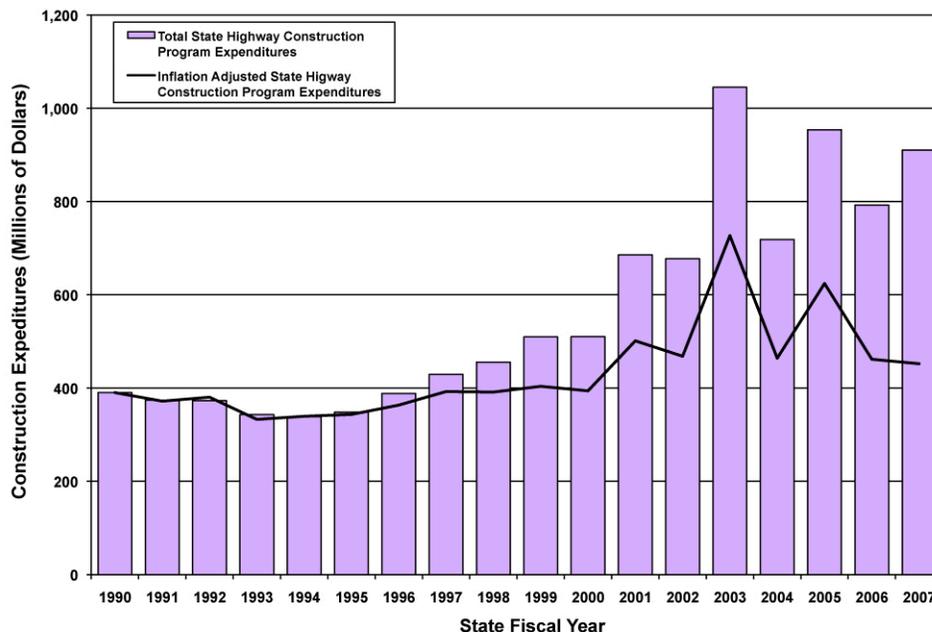
Source: Mn/DOT Office of Technical Support; Bureau of Labor Economics

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*The high inflation rate in highway construction costs has reduced the buying power of transportation funds.*

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The high inflation rate in highway construction costs has reduced the buying power of transportation funds, particularly since 2004. Figure 5.8 shows highway expenditures with and without inflation adjustment. Inflation adjusted expenditures show how much buying power has been reduced because of highway construction cost increases. Despite the increased level of revenues for transportation funding and increased use of bond funding, the increase in state road expenditures after adjusting for inflation has not increased as significantly.



**Figure 5.8 Minnesota State Highway Construction Expenditures**

Source: Mn/DOT Office of Investment Management

## 2008 Transportation Funding – Chapter 152

In February 2008, the Minnesota Legislature enacted major legislation affecting transportation funding for highways and transit as well as investment priorities. The Legislature increased the state’s Motor Vehicle Fuel Tax for the first time since 1988, increased the Motor Vehicle Registration Tax, and authorized an option of \$.025 county sales taxes to develop and operate transitways in the Twin Cities Metropolitan Area and Greater Minnesota. The Legislature also authorized \$1.83 billion in bonding over the 2009 to 2018 period to finance state highway related needs.

### Impact on Revenues

Minnesota Laws 2008, Chapter 152 increased the state motor fuel tax rate by five cents, from 20 cents to 22 cents per gallon in April 2008, followed by another increase of three cents per gallon in October 2008. In addition, Chapter 152 authorized a special fuel tax surcharge starting at 0.5 cents per gallon in August 2008 increasing to 3.5 cents per gallon. The surcharge will be imposed as long as there is debt service required on the bonds.

Chapter 152 also changed the depreciation schedule for the Motor Vehicle Registration Fee and removed the cap on the fee paid each year following the first year of registration, beginning with vehicles first registered in August 2008. The fee will be based on a 10 percent annual depreciation in the value of the vehicle until year 11 when a fixed surcharge of \$25 will be paid.

## Impact on Expenditures

Of the \$1.83 billion in bonds, Chapter 152 directed that \$1.7 billion be used for the following highway related improvements:

- Tier 1 and 2 Bridge Program — repair or replacement of all fracture critical or structurally deficient bridges by 2018 (\$1.2 billion). Of the 161 bridges that met these criteria, Mn/DOT has determined that 120 will need to be replaced or repaired by 2018. The total program cost is currently estimated at \$2.5 billion over 10 years and will be funded through \$1.2 billion of the \$1.7 billion available through bonds with the remaining \$1.3 billion from the state and federal tax revenues that make up the Mn/DOT State Road Construction Budget.
- Interchange projects (\$40 million) split 50/50 between the Twin Cities Metropolitan Area and Greater Minnesota.
- Statewide Transit Facility Improvements (\$50 million).
- Mn/DOT District 7 Legislative Priority (\$100 million for Trunk Highway 60 from Bigelow to Worthington).

Of the remaining bonds, Mn/DOT plans to spend \$275 million for accelerated pavement and safety projects in 2008 to 2010.

## State Road Construction Outlook from 2009 to 2028

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*Projecting highway revenues and costs 20 years into the future does not lend itself to a high degree of certainty.*

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For long-term planning purposes, an estimate of future revenues and cost increases has been developed. Projecting highway revenues and costs 20 years into the future does not lend itself to a high degree of certainty. This is especially true at this time, given the current turmoil in the national and state economy, the volatility in the price of gas over 2008, the extreme downturn in automobile sales, and the discussions surrounding a potential national Economic Recovery and Reconstruction Program emphasizing increased funding for infrastructure.

This long-term forecast, developed in early 2008, therefore, represents a snapshot in time. It is useful in developing a general sense of the revenues and costs and allows Mn/DOT to develop investment scenarios given a set of assumptions. For purposes of the four-year State Transportation Improvement Program that is updated annually, the forecast will be revisited to reflect current trends and any major changes in available funding due to new federal or state programs.

## Revenue Forecast

The revenue forecast has been based on assumptions derived from various national and state sources for outlook on future oil prices, growth in the economy, consumer behavior, and demographic changes. The following assumptions drive the forecast:

- The 2007 tax sources and tax rates will remain constant.
- The 2007 distribution of the State Trunk Highway Fund between the State Road Construction Program and other programs will remain constant.

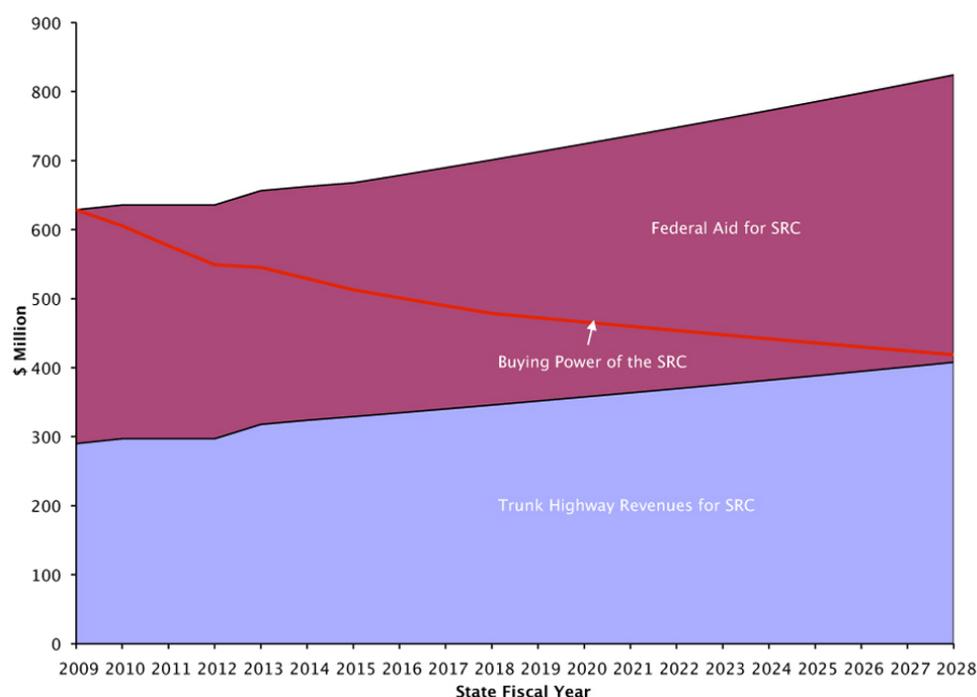
- World oil prices will be at the 2007 fall price levels, in the range of \$70 to \$80 per barrel and increase at least in line with inflation.
- Economic growth will be slower than the boom of the 1990s. The growth rates in the late 1990s were historically high, fueled by the emergence of the Internet and globalization.
- The housing market slump and tighter credit will reduce the ability or willingness to borrow for car purchases in the first few years of the forecast period.
- The aging of the population (particularly in the latter half of the forecasting period) and the anticipated slower growth in population in Minnesota will reduce vehicle purchases and demand for travel.
- Federal funds will not increase until after 2016 because of the anticipated shortfall in the Federal Highway Account. It was assumed that Congress would honor the funding levels of SAFETEA-LU.
- No federal earmarks revenues are included.

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*On average, revenues for the State Road Construction Program from the state sources have been projected to increase by 1.6 percent per year over the 20-year period.*

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The revenues are forecast to decline in the initial few years followed by subsequent increases. On average, revenues for the State Road Construction Program from the state sources have been projected to increase by 1.6 percent per year over the 20-year period (the growth rates can vary from year to year). Tab fee and MVST contributions are more volatile than the fuel tax, so the economic uncertainty makes it a challenge to accurately project future revenues; modest rates of growth are assumed for these revenue sources. Figure 5.9 shows the future revenue levels forecast for the State Road Construction Program.



**Figure 5.9 State Road Construction (SRC) Revenues and Future SRC Buying Power**

Source: Mn/DOT Office of Investment Management

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*Although cost increases have hit record levels in the recent past, it is assumed that supply and demand changes in the marketplace will lead to prices going back to normal levels.*

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## Construction Costs

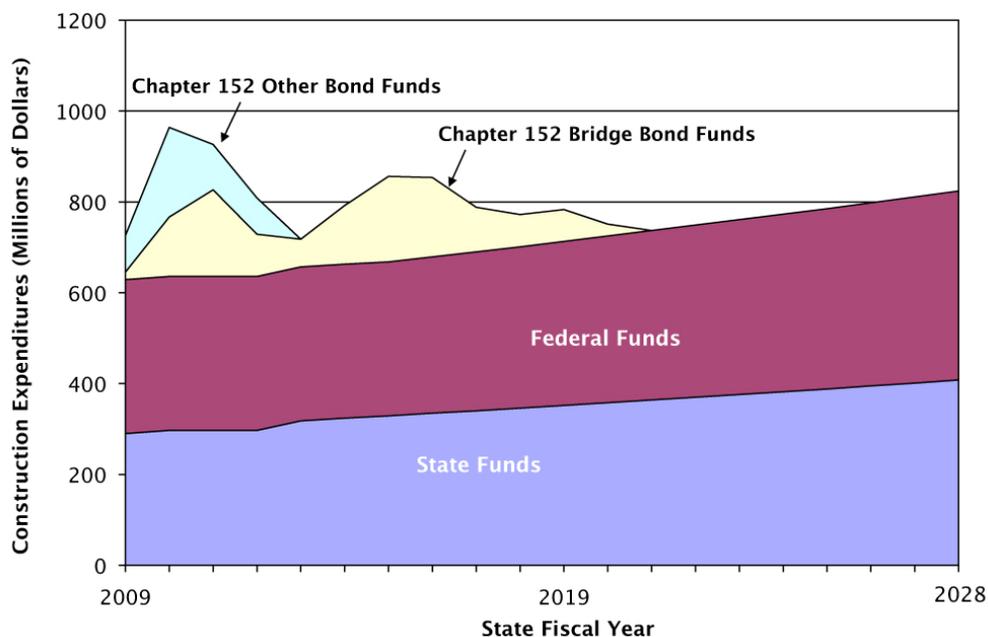
The highway construction cost inflation forecast was derived from the 20-year historical growth rate (1987 to 2007) of 3.9 percent per year. Although cost increases have hit record levels in the recent past, it is assumed that supply and demand changes in the marketplace will lead to prices going back to normal levels in the long run. The record level increases in construction material costs are not sustainable over the long run. For simplicity, it was assumed that construction cost increases will start declining from the current high price increases reaching three percent growth rates in the last 10 years of the planning period. In reality, costs will fluctuate from year to year with some years of very high cost increases and others of declining costs.

The impact of construction cost increases on the buying power of the projected revenues for the State Road Construction Program is shown in Figure 5.9. Since the projected rate of increase in construction costs is higher than the rate of increase for revenues, the buying power of the revenues in 2028 will be lower than in 2009.

## Chapter 152 Bond Funding

In addition to the revenues forecasted above, Mn/DOT's highway construction program, will be bolstered by the additional \$1.7 billion in bonds authorized by Chapter 152. The bonds will be repaid over a 20-year period with the revenues raised by the increased state motor fuel tax and vehicle registration fees also authorized in the Chapter 152 legislation. Analysis of the additional revenues from these tax and fee increases made in the spring of 2008 indicated that Mn/DOT's share (62 percent) would be sufficient to cover the projected debt service on the bonds over the next 20 years and the increase to Mn/DOT's annual operating budget that was also authorized by Chapter 152. However, there would be no additional revenues remaining for the State Road Construction Program. The funding level provided to Mn/DOT's Districts for long-range planning purposes was increased to account for the anticipated bond funding of various projects over 2009 to 2018.

Figure 5.10 depicts the State Road Construction Program expenditure outlook for 2009 to 2028 given the additional bonding authorized through Chapter 152. It should be noted that the identified bond expenditures are based on the preliminary plan for the Tier 1 and 2 Bridge Improvement Program developed in June 2008. This investment plan will also be updated as the design and cost estimates of the major bridges in the program are further developed.



**Figure 5.10 Highway Construction Program Outlook including Chapter 152 Bonds**

Source: Mn/DOT Office of Investment Management

## Possible New Financing Mechanisms for Highways

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*In the long run, revenues based substantially on a gas tax or MVST are not sustainable and run contrary to state and national energy conservation and environmental goals.*

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While there is much uncertainty associated with the revenues and construction costs presented here, some of the underlying trends and their causes would suggest that there will not be a significant increase in revenues without structural or rate changes to the current sources of transportation funding. Also, the increased demand for infrastructure investments will continue to put an upward pressure on construction costs. In the long run, revenues based substantially on a gas tax or MVST are not sustainable and run contrary to state and national energy conservation and environmental goals. The backlog of transportation investments also makes it difficult to fund all the needed system improvements under a pay-as-you-go mechanism. Furthermore, technological improvements that enable efficient pricing of the system have increased interest in managing the system to maximize throughput, thus reducing the need to construct new highways. Some of the innovative funding and financing mechanisms currently in use or under consideration around the country are outlined below.

## Tolling

As more and more states face the mounting challenge of delivering highway projects with limited or diminishing revenue coupled with increasing construction costs, tolling has begun to receive greater consideration in nearly all quarters. There are two reasons to consider tolling in the transportation system: generate revenue and manage demand.

Although these reasons for tolling are not mutually exclusive, the distinctions are important because they can influence when and how tolls are used. When tolls are proposed to generate revenue, it is for the purpose of financing construction and operation of a facility. National experience has shown, however, that few tolling projects fully cover their development, financing, operations, and maintenance costs with revenue generated from tolls alone, implying that most toll-financed projects require some form of public subsidy.

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*Congestion pricing helps transportation authorities better manage demand and achieve better performance from their system.*

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Tolling to manage demand, also called congestion pricing, is not a means of raising revenue per se. Congestion pricing, however, helps transportation authorities better manage demand and achieve better performance from their system. This can delay or avoid investments that would otherwise be necessary to expand capacity to meet demand. In addition the revenue that is raised, beyond the costs of operations and enforcement, can be a motivating force especially if transit and high-occupancy vehicles, like carpools or vanpools, benefit.

In Minnesota, the I-394 MnPASS project has demonstrated how congestion pricing on the high occupancy toll lanes has allowed more cars to move through the same physical space and make more efficient use of the existing high occupancy vehicle (HOV) lanes. Conversion of the I-35W HOV lanes, part of the Urban Partnership Agreement to be implemented by fall of 2009, is the state's next congestion pricing project and will build on the innovations introduced on I-394. Along with the I-35W high-occupancy toll (HOT) lane conversion, Mn/DOT will introduce a new demand management pricing tool called priced dynamic shoulder lanes (PDSL) from 46th Street in south Minneapolis into downtown Minneapolis. The PDSL facility will be operated as a bus rapid transit and HOV/HOT lane only during the highest demand periods of the day and will function as a standard highway shoulder in off-peak periods. An advantage of this measure will be to provide lane continuity to the HOT lane system south of 46th Street without appreciably expanding the footprint of the existing roadway.

## Mileage-Based User Fees

Mileage-based user fees are a means to charge users based on how much a vehicle is driven. Although mileage-based charges can apply to public sector costs like taxes or to private sector costs like insurance or vehicle leases, this discussion will focus only on those fees associated with the public sector.

Since its inception in the 1920s, the gas tax has served as a pillar of the state and federal transportation revenue system. Many transportation experts believe that cracks are appearing in that pillar due to improved vehicle fuel efficiency and the increasing

prevalence of alternative fuel and electric powered vehicles. The result of these forces has been a flattening and declining of motor fuel tax revenue.

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*Pressure is mounting to find more suitable means by which to capture road use fees.*

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As a result, pressure is mounting to find more suitable means by which to capture road use fees. The mileage-based fee is commonly thought of as a replacement, or perhaps a supplement, for the motor fuel tax (or perhaps the registration fee). Motor fuel taxes are based on consumption of energy, which loosely translates to a per-mile fee. With a wide variation in fuel efficiency among today's vehicles, the per-mile fee ranges from four cents per mile for a vehicle that gets 10 miles per gallon to as low as one cent per mile for a vehicle that achieves 40 miles per gallon. Under the current motor fuel tax system, the more energy a vehicle consumes per mile, the higher the per-mile rate that is paid by the consumer. For more than a decade, transportation leaders and policy makers around the country have advocated converting or replacing the motor fuel tax with a mileage-based fee. Depending on how they are administered, mileage-based fees could be more economically efficient and fair than existing pricing practices. An important attribute of mileage-based fees is that it gives motorists a stronger price signal on a per unit basis of travel than consumers now get with the motor fuel tax.

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*Mileage-based fees give motorists a stronger price signal on a per unit basis of travel than consumers now get with the motor fuel tax.*

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Several states including Minnesota and the federal government have sponsored research and demonstrations that are testing the viability of the mileage-based fee. Additionally, The Netherlands is on track for the nationwide implementation of a mileage-based fee that will replace that country's registration system at the same time leaving in place their motor fuel tax.

## **Innovative Finance**

Interest in innovative transportation finance is growing throughout the country as states look for new ways to meet unprecedented transportation funding gaps and shortfalls. Mn/DOT is beginning to work with its transportation partners and stakeholders to explore new innovative finance concepts and options for maximizing limited transportation dollars, better aligning user costs with benefits, and delivering more transportation projects sooner.

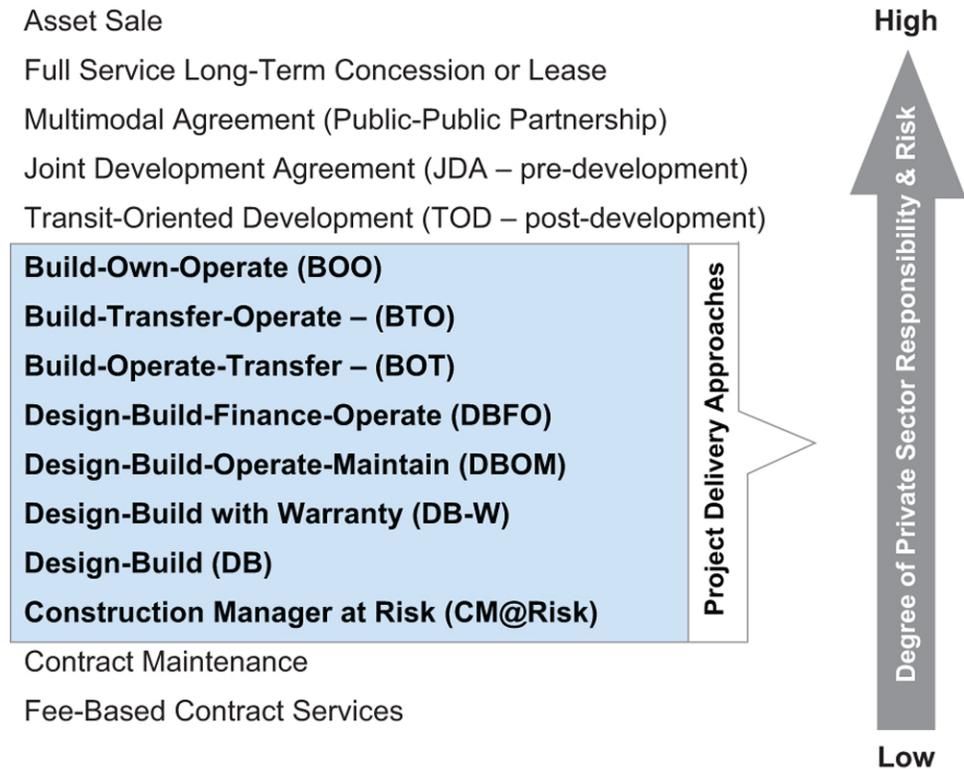
Mn/DOT is currently establishing goals and developing a plan for this new innovative finance initiative. The plan will guide the department's exploration and assessment of innovative finance options and best practices, as well as its collaboration and outreach in this area. The plan will also guide the implementation and evaluation of innovative finance solutions and the integration of successful innovative approaches into the department's planning and project development processes.

Although, by itself, innovative finance will not close the transportation funding gap, it has the potential to be an integral part of the solution. Solving the transportation funding puzzle in the future will require numerous funding sources and financing techniques and will involve transportation partners and stakeholders. Greater diversification of funding sources and techniques will improve the overall health of transportation funding for generations to come.

## Public-Private Partnerships

Traditionally, private sector participation in transportation has been limited to separate planning, design, or construction contracts on a fee-for-service basis, based on the public agency’s specifications. Expanding the private sector role through public-private partnerships (PPPs) may allow public agencies to tap private sector technical, management, and financial resources in new ways to achieve agency objectives such as greater cost and schedule certainty, innovative technology applications, specialized expertise, or access to private capital.

Under PPP agreements, both the public and private sector share risks and rewards in developing and operating transportation projects or programs. PPPs are often seen as a means to gain greater efficiency in program or project delivery or as a means to accelerate development of projects. There are many forms of PPPs that populate a continuum from fee-based contract services to full asset sales. Figure 5.11 illustrates that the variety of partnership options that have been employed around the U.S. and the world.



**Figure 5.11 Public-Private Partnerships Continuum**

Source: Cambridge Systematics

Within the continuum of project delivery approaches, options range from construction management to build-own-operate agreements. Minnesota has had a great deal of experience with design-bid-build projects that are on the lower end of the continuum; however, the state has had no experience with build-own-operate tolling concessions.

Mn/DOT plans to explore ways the private sector can help deliver more transportation improvements quickly.

## Bonding

Traditional transportation bonds are issued by state and local government entities to finance various projects and their associated expenses. A bond is a written promise to repay borrowed money on a schedule and at a fixed rate over a period of time.

State general fund bonding to raise revenues for local bridge projects has been a traditional source of transportation funding in Minnesota. However, bonding with the anticipated receipts of the State's Trunk Highway Fund revenues to develop or accelerate transportation projects is relatively new.

## Emissions Fees

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*Mileage-based emission fees that reflect each vehicle's emission rates are receiving greater consideration in both government and the private sector.*

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Mileage-based emission fees that reflect each vehicle's emission rates are receiving greater consideration in both government and the private sector as concerns over global warming grow. If implemented, emissions fees would give motorists with higher polluting vehicles a greater incentive to reduce their mileage or purchase vehicles that emit less pollution. Motorists who must drive high mileage will be given an incentive to choose less polluting vehicles. There are a number of ways that this might work. For example, an older vehicle that lacks current emission control equipment might be charged a five cent per mile fee, while a less polluting vehicle could pay one cent per mile. A vehicle that qualifies as an ultra-low emitting may receive an even greater discount.

It is possible that this concept could result in large vehicle emission reductions and simultaneously significant reductions in vehicle miles of travel (VMT). Although emissions fees may result in a new source of revenue, it is not clear how the trade-off between reduced VMT and this new source of revenue would impact the total transportation funding picture. In addition, there is likely to be a significant cost for enforcing such a program.

## Weight-Distance Charges

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*Weight-distance fees are a mileage-based road use charge that increases with vehicle weight.*

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Weight-distance fees are a mileage-based road use charge that increases with vehicle weight. If implemented according to the 1997 Federal Highway Administration (FHWA) Road User Fee Task Force recommendation fees could range from about 3.5 cents per mile for automobiles up to 20 cents per mile for combination trucks. It has been argued that this is a more equitable way to fund roads than fuel taxes, because it can more accurately represent the roadway costs imposed by individual vehicles.

Oregon is the only state that presently has a weight-distance charge for heavy trucks.

## Transit Funding in Minnesota

Public transit funding in Minnesota is derived from a combination of state, local, and federal funds. In Minnesota, federal and state transit funds are administered by two governmental jurisdictions – Mn/DOT for the 80-county geographic area of Greater Minnesota and the Metropolitan Council for the seven-county Twin Cities Metropolitan Area (TCMA). The sections below outline the funding sources for each of these entities.

### Federal Transit Funding Programs

The federal funding programs are administered by the Federal Transit Administration (FTA). The Federal Transit Account receives from the federal motor fuel tax (2.8 cents per gallon) and the General Fund appropriations. Mn/DOT and the Metropolitan Council receive and administer federal funds. In general, FTA distributes operating and capital program funding based on the population of urban and rural areas. Table 5.1 shows the level of federal funding allocated to the various programs in SFY 2007.

**Table 5.1 Examples of Federal Transit Funds Received in Minnesota by Program**

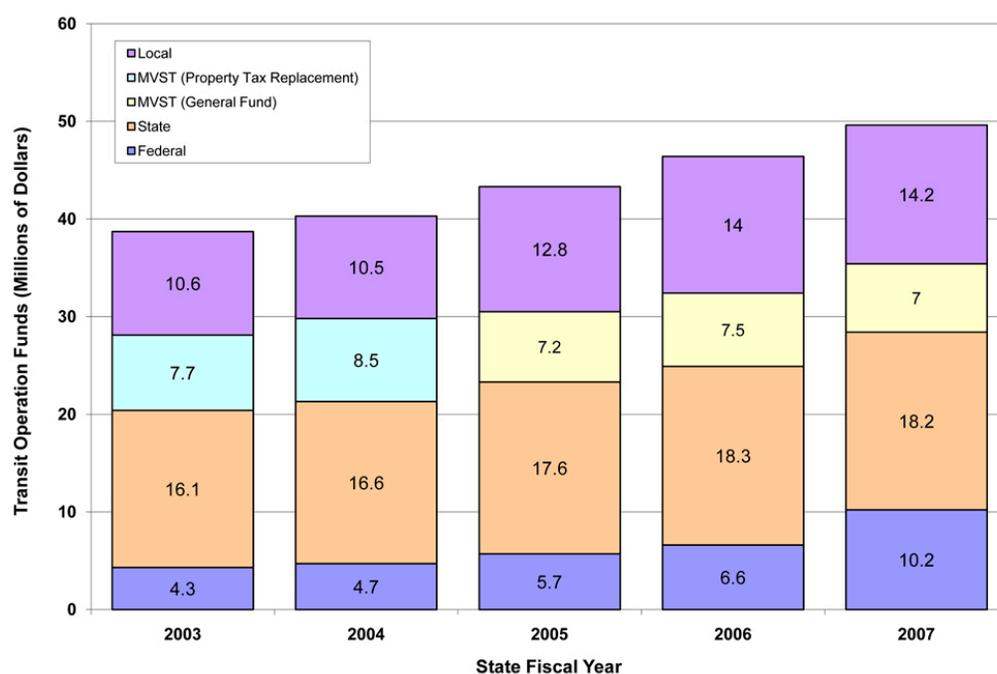
<b>Federal Transit Fund Program</b>	<b>Funds Allocated to Minnesota in Fiscal Year 2007</b>
Special Needs for Elderly Individuals and Individuals with Disabilities Program (Section 5310)	\$1,751,132
Non-urbanized Area Formula Program (Section 5311)	\$11,178,461
Job Access and Reverse Commute (Section 5316)	\$1,270,642 allocated as follows: <ul style="list-style-type: none"> <li>– Twin Cities Metropolitan Area: \$752,458</li> <li>– Greater Minnesota Metro areas: \$243,496</li> <li>– Other areas in Greater Minnesota: \$494,688</li> </ul>
New Freedom (Section 5317)	\$980,199 allocated as follows: <ul style="list-style-type: none"> <li>– Twin Cities Metropolitan Area: \$524,419</li> <li>– Greater Minnesota Metro areas: \$142,564</li> <li>– Other areas in Greater Minnesota: \$313,216</li> </ul>
Urbanized Area Formula Program (Section 5307)	\$5,052,284 (Greater Minnesota only)

Source: Mn/DOT Office of Transit, 2007

In addition to these programs, funds are made available for specific projects from the various discretionary programs. An example of a discretionary program is the New Starts Capital Improvement Program. This provides funds for the construction of new fixed transit systems or extensions to the existing systems or for high occupancy vehicles. Examples of this funding would be the Central Corridor light rail and the Northstar Commuter Rail projects. Furthermore, certain federal highway funds can be used for transit purposes.

## Greater Minnesota Transit Funding

Federal, state, and local revenues presently support transit funding in Greater Minnesota. Figure 5.12 illustrates the sources and levels of transit operations funds from 2000 to 2008, where 2007 and 2008 are the authorized budget levels. The local funding is from local taxes and fares.



**Figure 5.12 Greater Minnesota Transit Operations Revenues**

Source: 2007 Minnesota Transit Report, Mn/DOT Office of Transit

Greater Minnesota transit operating revenue has increased in recent years. It was \$38.7 million in 2003 and increased to \$49.6 million in 2007. During this time federal funding increased from \$4.3 million in 2003 to \$10.2 million in 2007. Local share has also increased over time. Transit in Greater Minnesota will receive additional funds as a consequence of the changes following the MVST legislative amendment. In 2008, 1.8 percent of MVST will be available for Greater Minnesota transit, increasing to four percent in 2012.

Table 5.2 shows the Greater Minnesota transit appropriations for the 2008 and 2009 biennium. This includes some funds for the capital program.

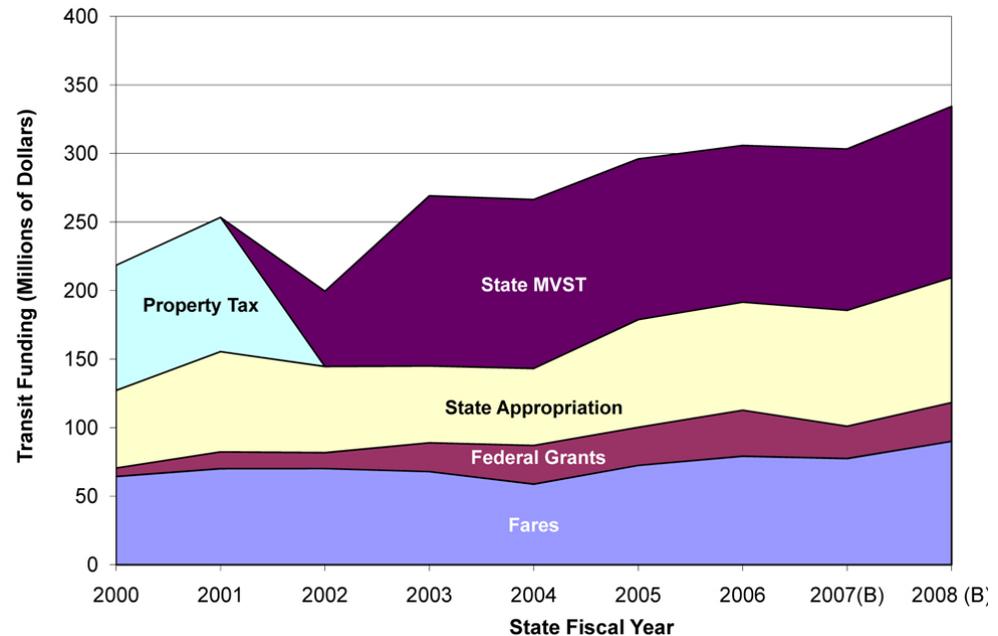
**Table 5.2 State Appropriations for Greater Minnesota Transit, 2008-2009 Biennium**

Fund/Program	2008	2009	Total
Public Transit Assistance - General Fund	\$21,735,000	\$19,248,000	\$40,983,000
Capital Assistance	\$1,000,000	\$1,000,000	\$2,000,000
Greater Minnesota Transit Fund - MVST	\$7,446,000	\$9,116,000	\$16,562,000
<b>Total</b>	<b>\$30,181,000</b>	<b>\$29,364,000</b>	<b>\$59,545,000</b>

Source: 2007 Minnesota Transit Report, Mn/DOT Office of Transit

### Twin Cities Metropolitan Area Transit Funding

Currently the four main sources of funding for transit operating costs in the TCMA are fares, federal grants, state appropriations, and state MVST revenue. Figure 5.13 illustrates transit funding by source from 2000 to 2008, where 2007 and 2008 are the authorized budget levels. Prior to 2002, almost 50 percent of transit operating cost was funded by property taxes. In 2001, legislation replaced property tax revenue with MVST revenue resulting in a sharp drop in transit funding in 2002 due to MVST being allocated on a fiscal year basis and property tax on a calendar year basis. The transition caused six months of lost revenues for transit.



**Figure 5.13 TCMA Transit Operations Funding Sources**

Source: Metropolitan Council 2007 Transit System Performance Evaluation

Funding for transit in the TCMA has increased by 53 percent in absolute terms since 2000. The increase largely occurred due to increased funding from state appropriations and federal grants as well as an increase in estimated fare box receipts in 2008. At present, the share of funding from each of the state sources is about equal.

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*The revenues from MVST have declined by five percent since 2003.*

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The shift from property tax revenue to MVST revenue for transit appears to have created more volatility in funding. The revenues from MVST have declined by five percent since 2003. The MVST revenues may be more susceptible to economic changes than property taxes.

Recent increases in ridership have bolstered fare box receipts, increasing the share of revenue anticipated from this source.

Table 5.3 lists the state appropriation for the 2008-2009 biennium (operating and capital programs).

**Table 5.3 State Appropriations for Metro Transit, 2008 to 2009 Biennium**

Fund/Program	2008	2009	Total
Public Transit Assistance - General Fund	\$93,543,000	\$73,453,000	\$166,996,000
Hiawatha LRT Operations	\$5,300,000	\$5,300,000	\$10,600,000
Metro Transit Fund - MVST	\$119,136,000	\$144,550,000	\$263,686,000
<b>Total</b>	<b>\$217,979,000</b>	<b>\$223,303,000</b>	<b>\$441,282,000</b>

Source: 2007 Minnesota Transit Report, Mn/DOT Office of Transit

Local funding is also used to fund transit operating costs in the TCMA. In 2007, \$107.3 million came from local funding sources, accounting for 32.8 percent of the total metropolitan transit operating costs. This share may change to some extent following the 2008 Legislative session, which included legislation giving counties the authority to levy a 0.25 percent sales tax to fund transit programs if approved locally through a referendum vote.

## Bicycle and Pedestrian

Funding for bicycle and pedestrian facilities in Minnesota presently comes from a mix of local, state, and federal sources. The Mn/DOT Office of Transit Bicycle and Pedestrian Section is working toward developing a tracking mechanism for local projects and presently tracks state and federal funding. It also provides technical assistance to state agencies and local authorities for bicycle and pedestrian system planning, capital improvement projects, and maintenance.

At the federal level, the Intermodal Surface Transportation efficiency Act of 1991 established an “enhancement” category for projects that are funded with a percentage of the Surface Transportation Funds (STP). The STP funding included a minimum apportionment provision over the life of the act of 10 percent for enhancement activities. Twelve project categories are considered enhancement activities, including construction of pedestrian and bicycle facilities, and safety and education for bicyclists and pedestrians. In Minnesota, the Area Transportation Partnerships (ATPs)

are asked to program enhancement projects. As illustrated in Table 5.4, bicycle and pedestrian-related enhancement projects are anticipated to comprise the largest source of funding in the 2009-2012 STIP.

**Table 5.4 Bicycle-Pedestrian Programs and Funding for Projects in the 2009-2012 STIP**

Fund/Program	Total (\$)	Project Selection Authority	Share of State Bicycle-Pedestrian Investment (%)
STP	912,100	ATPs	<1
STP Urban Guarantee (apportioned by Congress directly to the MPO)	18,195,400	Met Council	11
State Funds	348,000	Mn/DOT	<1
STP Enhancements	98,083,394	ATPs	58
STP Enhancements - High Priority Projects	5,164,712	Congress	3
STP Enhancements - Federal Fund Miscellaneous	1,586,000	FHWA	<1
Safe Routes to School	2,969,584	Mn/DOT	2
Recreational Trails	1,313,464	DNR	<1
Other High Priority Projects	21,904,513	Congress	13
Other Federal Fund Miscellaneous	18,459,700	FHWA	11
<b>Total</b>	<b>168,936,867</b>		<b>100</b>

Source: Mn/DOT Office of Transit – Bicycle and Pedestrian Section

## Aeronautics

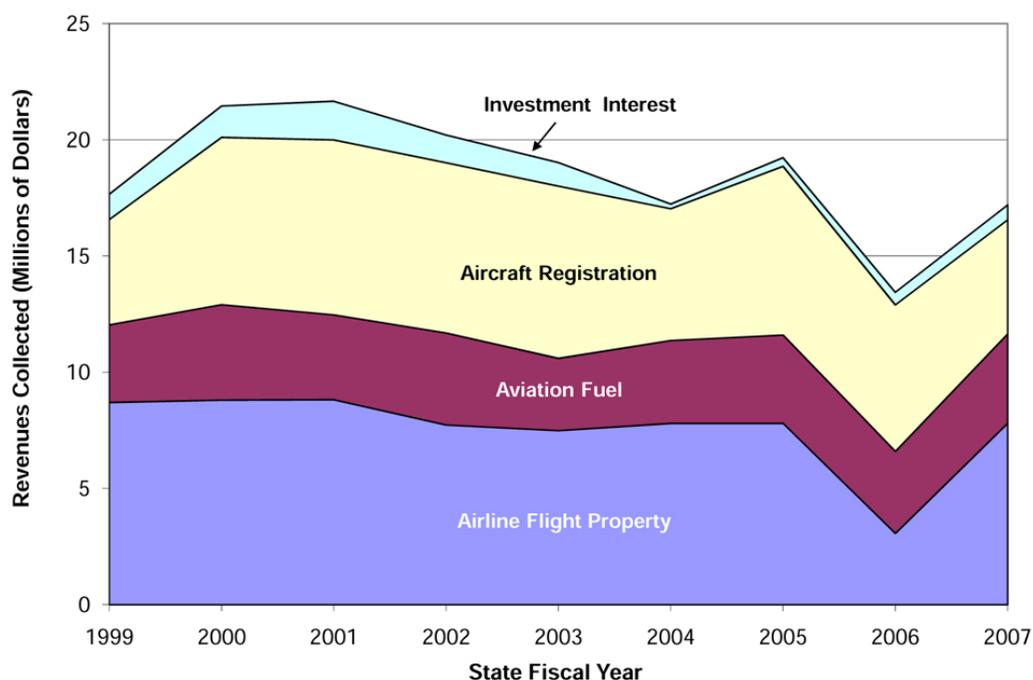
The Mn/DOT Office of Aeronautics is responsible for planning the state system of airports outside the TCMA. The Legislature has designated the Metropolitan Council as the aviation system planning agency for the seven-county TCMA. The Office of Aeronautics provides financial and technical assistance to Greater Minnesota airports for planning, capital improvement projects, and maintenance. The Metropolitan Airports Commission, which owns the Minneapolis-Saint Paul International Airport and six reliever airports, has its own sources of funding (e.g., landing fees, concessions, parking fees, hangar rentals, etc.) and provides its own funding for most of the projects at its seven airports.

## State Airports Fund

Minnesota Statutes, Chapter 360, established the State Airports Fund. The revenues in the fund are derived from the following aviation user taxes:

- **Airline Flight Property Tax:** A tax paid by the airlines in lieu of other taxes on their flight property.
- **Aviation Fuel Tax:** A tax paid by all aviation fuel users.
- **Aircraft Registration:** An annual licensing fee for civil, non-airline aircraft based in Minnesota and those operated in the state for more than 60 days per year.
- **Investment Income:** State airports fund money invested in securities by the state board of investment.

Figure 5.14 shows the amount of revenues collected from the different state sources for fiscal years 1999 to 2007. The sharp decline in revenues in 2006 resulted from the bankruptcy filings of Northwest, Delta, Mesaba, and Comair airlines.



**Figure 5.14 State Airport Fund Revenues**

Source: Mn/DOT Office of Aeronautics

Expenditures from the State Airports Fund are distributed via the programs listed in Table 5.5. Airport grant-in-aid eligibility includes complying with ownership, license, state airport system, and airport safety zoning requirements. Eligible airport projects include, but are not limited to, planning, land acquisition, paving, lighting, navigational aids, obstruction removal, equipment purchase, fencing, noise mitigation, and some airport buildings. Each year more projects are identified in municipality Airport Capital Improvement Plans than are able to be funded.

**Table 5.5 State Funded Programs for Aviation**

<b>State Airports Fund Programs</b>	<b>Annual Value (\$) (approximate)</b>	<b>Purpose</b>
Airport Capital Improvement Program	\$10,400,000	Grants focus on safety improvements, preserving existing aviation infrastructure, navigational aides, and coordination of air travel with surface modes.
Airport Maintenance and Operations Program	\$3,900,000	Reimburses a portion of airport operation costs incurred, based on existing infrastructure.
Hangar Loan Program	\$4,400,000	Buildings generate revenue for airports and provide protection and security for the aircraft fleet. The Revolving Account is replenished by loan payments.
Air Service Marketing Program	\$200,000	Vital economic development tool. Encourages preservation or expansion of airline service.

Source: Mn/DOT Office of Aeronautics

## Federal Funds - Aviation Trust Fund

Federal funding for aeronautics programs comes from the Aviation Trust Fund. Revenues in the trust fund come from taxes on users of the aviation system: the airline ticket tax, federal aviation fuel tax, and an excise tax. Airport Improvement Program (AIP) funds are appropriated by Congress from the Aviation Trust Fund.

Federal Aviation Trust Funds are distributed through the Airport Improvement Program (AIP) as determined by Congress. Historically, Minnesota airports have received federal funds totaling approximately \$70 million per year from the 3 categories of AIP funds.

1. Entitlements - amounts ranging from \$150,000 at general aviation airports to \$1 million at Minnesota's three largest commercial service airports (Minneapolis/St. Paul, Rochester, and Duluth).
2. Apportionment - the state receives a federal formula apportionment amount of approximately \$5.2 million per year. These project funds are prioritized by Mn/DOT Aeronautics and the FAA.
3. Discretionary – a variable amount of federal discretionary funds is available each year based upon national competition and FAA priority.

## Passenger Facility Charge

Since 1990, airports with scheduled passenger service have been allowed to impose a Passenger Facility Charge (PFC). The airport owner imposes the charge on enplaning passengers for a specific project and the fee is collected by the airline. The Federal Aviation Administration must approve the collection of all PFCs. The PFCs can be used to offset specific capital improvement costs, including the local matching share for federal grants.

## Rail

The State of Minnesota does not own or operate railroads. Mn/DOT has worked in cooperation with the state's counties, cities, townships, and railroads to improve the railroad-highway infrastructure in order to support economic growth and connect Minnesota to global opportunities. State involvement in rail projects includes federal and state funds combined with private money provided by railroads and rail users. State rail investment programs include the following:

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*Under SAFETEA-LU approximately \$5.7 million per year have been apportioned for rail safety projects in Minnesota.*

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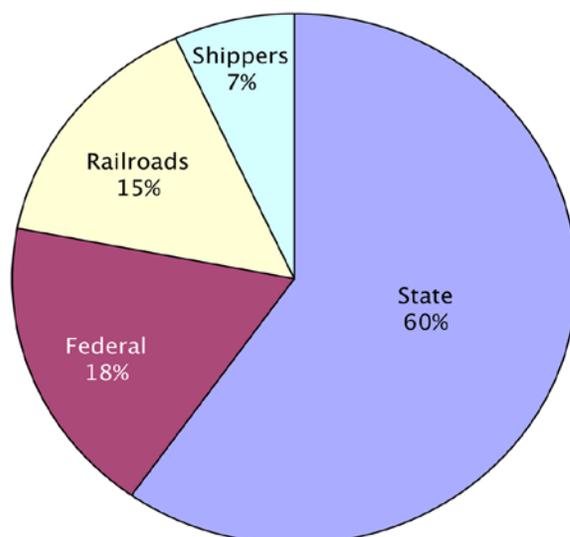
### Minnesota Railroad – Highway Grade Crossing Safety Improvement Program

The goal of this program is to save lives at grade crossings. Most of the projects under this program have been funded using federal funds with matching state, local, and railroad funds. Federal funds have been apportioned to the State of Minnesota each year since 1974. Under SAFETEA-LU approximately \$5.7 million per year have been apportioned for rail safety projects in Minnesota. State funds are available to match the federal funding for this program at the required 10 percent contribution.

### Minnesota Rail Service Improvement Program

The MRSI Program was established in 1976 to help prevent the loss of rail service on lines potentially subject to abandonment by railroads. Bond funding of \$2.5 million and \$3.7 million was appropriated for the MRSI Program by the Minnesota legislature in 2005 and 2006 respectively.

Figure 5.15 shows the share of funding from different sources. Of the \$130.2 million invested in the MRSI Program from 1978 to 2007, 60 percent has been funded by state revenues.



**Figure 5.15 Minnesota Rail Service Improvement Program Funding Sources**

Source: Mn/DOT Office of Freight and Commercial Vehicle Operations

The MRSI Program provides funding for projects in the categories listed below:

- Rail Purchase Assistance Program
- Rail Rehabilitation Program
- Capital Improvement Loan Program
- Rail User and Rail Carrier Loan Guarantee Program
- State Rail Bank Program

## Waterways

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*From 1996 to 2007, Minnesota invested \$17.5 million in port improvements.*

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The State of Minnesota does not own or operate any waterway facilities. Local port authorities own and operate the ports funded through fees charged to the carriers.

In 1991, the Minnesota Legislature passed the Minnesota Port Development Assistance Program, which was designed to aid the public ports in modernizing their physical infrastructure. The program was first funded in 1996 at \$3 million by bonds. As of December 2007, the state has appropriated a total of \$17.5 million for this work. The funding is from the state General Fund revenues and bonds.

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<sup>1</sup> *Highway Statistics 2006*, U.S. Department of Transportation, Federal Highway Administration.

<sup>2</sup> *Local Government Own Source Spending on Roads and Streets*, Minnesota House of Representatives, Research Department, 2007.

<sup>3</sup> Advanced construction is an innovative financing tool that allows states to let multiple year projects by authorizing state funds in anticipation of future federal funds.

## Chapter 6: Plan Vision and Approach

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Earlier chapters of this plan lay out the trends and issues that will affect transportation in Minnesota over the next 20 years. As these trends and issues were shared with stakeholders around the state during the development of this plan, a long-term vision for mobility in Minnesota began to emerge. Stakeholders identified a range of desired system improvements, additions, and enhancements to transportation in Minnesota. Some of the key components include:

- Superior highway connections to adjacent states and Canada
- Active ports in Duluth and along the Mississippi River
- Connections to a national high-speed passenger rail network
- Cost-competitive national freight rail connections supported by a network of regional freight rail corridors and intermodal terminals
- Vibrant Minneapolis-Saint Paul International Airport “Hub” and secondary supporting airports throughout the state
- Upgraded highways and expanded transit service connecting the regional trade centers throughout the state
- Reliable mobility in the Twin Cities through innovative highway capacity improvements and expanded transitways
- Reliable mobility in Greater Minnesota metropolitan areas through expansion of both the highway network and transit systems
- Greater transit options throughout the state with improved connectivity between services and modes
- Safe travel throughout the state, with a goal toward zero deaths
- Expanded networks for safe biking and walking
- Infrastructure maintained in safe and structurally sound condition

The vision is broad and far reaching and may take the next 50 years to fully realize. But, the vision speaks to transportation as a critical ingredient for the continued economic vitality of the entire state and the livability of its communities.

This plan is intended to move Minnesota toward the long-range transportation vision, recognizing the challenges and opportunities involved. The following key principles frame the plan approach and are reflected throughout the policies and strategies:

**1. Continue performance-based planning and investment management:**

This plan continues the commitment to performance-based planning established in the 2003 Statewide Transportation Plan. This plan further suggests that performance measures be developed and applied to all modes and jurisdictions as a way to measure progress and the effectiveness of policies and strategies.

**2. Articulate a more multimodal and multijurisdictional approach to transportation:**

The 2003 plan was primarily a plan for Mn/DOT and focused on the highway system as the backbone of the transportation system. While this plan continues to acknowledge the importance of the highway system, it also recognizes that a more multimodal and multijurisdictional approach to transportation is needed to achieve major goals, including maintaining Minnesota's economic competitiveness, reducing greenhouse gas emissions, and providing modal choice for consumers.

**3. Build on existing plans:**

Since 2003, several major modal and specialty plans and studies have been completed related to aeronautics, freight, bicycles, and safety. Metropolitan plans have been updated around the state. The policies and strategies in this Statewide Transportation Policy Plan build on these plans and studies and, in many instances, identify issues and strategies that need to be examined further in the future.

**4. Concurrently update the 20-year State Highway Investment Plan:**

Mn/DOT develops its long-range State Highway Investment Plan in a decentralized manner through the preparation of plans by each of its eight districts. The last update took place during 2004 after the Statewide Transportation Plan was adopted. To provide stakeholders with a clearer picture of the link between the policy and investment program, the District Highway Investment Plans have been updated concurrently with the policy plan process. The investment plans are summarized in a separate document, the 20-year Statewide Highway Investment Plan.

**5. Emphasize importance of partnerships:**

Minnesota's transportation system is a complex network of interconnected modes, owned and managed by a variety of government jurisdictions and private companies. To operate effectively, coordination across modes and jurisdictions is essential. Toward this end, the plan identifies key issues and strategies for consideration by Mn/DOT's partners who provide key components of the statewide system. The plan begins to set a framework for enhanced coordination and stronger collaboration among Minnesota's transportation partners.

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*This plan recognizes that a more multimodal and multijurisdictional approach to transportation is needed.*

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*Innovation is imperative to address transportation challenges.*

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#### **6. Commit to innovation:**

With all the challenges facing Minnesota's transportation system in both the near and longer term, innovation is imperative. Creativity and innovation needs to permeate every aspect of transportation service delivery, from how revenues are generated, services are contracted, and projects are constructed to how existing capacity and right of way are managed.

#### **7. Seek cost-effective and context-appropriate solutions:**

Given limited financial resources, it is essential that cost-effective and context-appropriate solutions are implemented so that resources can be stretched to provide benefits to the greatest number of users.

#### **8. Maintain a flexible and opportunistic approach:**

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*This plan has been developed during a time of significant economic change.*

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This plan has been developed during a time of significant change bringing both challenges and opportunities for the future of transportation in Minnesota. The Minnesota Legislature approved increased funding for transportation and directed investments toward a major bridge rehabilitation program. Gas prices peaked in July 2008 at more than \$4.00 per gallon, Minnesotans drove fewer miles, transit ridership increased, and transportation revenues declined. As of this writing, gas prices have plummeted and the national economy is in serious recession. The economic outlook has prompted the U.S. Congress to pass a stimulus bill and major infrastructure investment program. Clearly, the policies, strategies, and investment plans set forth in this plan may need to be revisited to respond to the evolving challenges and opportunities.

## **Policies, Strategies, and Performance Measures**

The remainder of this plan provides direction for the development of all levels of Minnesota's transportation system over the next 20 years. Chapter 7 outlines the policies, strategies, and performance measures to address the various transportation trends and issues described in this plan. The policies, strategies, and performance measures are organized around the following 10 key policy objectives relating to maintaining and improving the multimodal, multijurisdictional transportation system in Minnesota.

1. **Traveler Safety:** Reduce the number of fatalities and serious injuries for all travel modes.
2. **Infrastructure Preservation:** Ensure the structural integrity of the transportation systems serving people and freight.
3. **Maintenance and Security:** Maintain and operate the statewide transportation system in an efficient, cost-effective, and secure manner.
4. **National and Global Connections:** Maintain and strengthen Minnesota's strategic multimodal connections to the Upper Midwest, the nation, and the world.
5. **Statewide Connections:** Enhance the movement of people and freight between regional trade centers within Minnesota by providing efficient, multimodal transportation connections.

6. **Twin Cities Mobility:** Provide mobility and address congestion in the Twin Cities by optimizing use of the existing system and making strategic capacity investments in both highways and transit.
7. **Greater Minnesota Metropolitan and Regional Mobility:** Provide for the changing transportation needs of people and freight within Greater Minnesota regions and metropolitan areas by planning regionally for critical investments and improving coordination across modes and jurisdictions.
8. **Community Development and Transportation:** Support local efforts to increase jobs, expand housing, and improve community livability through more coordinated planning, complementary design, and timely communication among land use and transportation authorities.
9. **Energy and the Environment:** Improve the energy efficiency and environmental sustainability of Minnesota's transportation system.
10. **Accountability and Transparency:** Strengthen accountability and transparency in the delivery of Minnesota's transportation system.

The policies, strategies, and performance measures as well as transportation issues and needs have been identified for multiple modes. Highway-based transportation, including travel by personal vehicle, bus, or freight-hauling truck, is discussed in each policy area. Railroads, which provide both freight and passenger transport, are discussed explicitly in all policy areas except 7 and 10 where they should be considered part of the freight system and future studies discussions. Aviation is discussed in policy areas 1, 2, 3, 4, 5, and 8. Bicycle and pedestrian travel is discussed in all policy areas except 4 and 5, as large numbers of long-distance, global, or statewide trips are not presently common for these modes.

A number of performance measures and indicators are selected for representation and discussion within individual policy areas. A full description of all performance measures and indicators associated with this plan is provided in Appendix D.

## Future Plans and Studies

Chapter 8 outlines that additional plans and studies that will be completed over the next two years in response to issues or strategies identified in this plan. These studies range from identifying the vision for the Twin Cities Metropolitan Area highway system to clarifying the state's role, responsibility, and vision for passenger rail. It is anticipated that the results of these studies will lead to an amendment of this plan in late 2010 or early 2011.

## Chapter 7: Policies, Strategies and Performance Measures

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*A multimodal approach is needed to maintain competitiveness, reduce greenhouse gas emissions, and provide modal choice.*

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In developing the policies, strategies, and performance measures presented in this chapter, Mn/DOT acknowledges that a complete and efficient transportation system within Minnesota depends on the operations and investments made by multiple government agencies and numerous private companies that manage and operate parts of the system. It is in this spirit that the policies, strategies, and performance measures in this Minnesota Statewide Transportation Policy Plan 2009-2028 speak to all travel modes and governmental jurisdictions. As such, this plan seeks to provide a more comprehensive framework to coordinate and integrate the multimodal, multijurisdictional networks that comprise Minnesota's transportation system.

The policies, strategies, and performance measures presented in this plan are organized into 10 policy areas: Traveler Safety, Infrastructure Preservation, Maintenance and Security, National and Global Connections, Statewide Connections, Twin Cities Mobility, Greater Minnesota Metropolitan and Regional Mobility, Community Development and Transportation, Energy and the Environment, and Accountability and Transparency. The policy areas discuss transportation using highways, railroads, aviation, ports and waterways, or sidewalks and trails and each includes four sections:

- **Summary:** Short summary of the policy area and the main strategies that will be pursued to address key issues related to the policy area.
- **Background and Context:** Brief overview of key information shaping the policy area including the importance and relevance of the policy area to the transportation system, prior efforts in this area, and/or major trends or events that have influenced its development.
- **Strategies:** Description of key issues and corresponding strategies that will be pursued within Minnesota over the next five years for the policy area. These strategies provide guidance for the management and operations of state-owned transportation systems. The strategies also set expectations and guidance for other government agencies and private business regarding their elements of the transportation system.
- **Performance Measures and Indicators:** Each policy area includes a list of performance measures and indicators related to stated policies and strategies. Mn/DOT will track these measures and indicators over time. While a select number are included and discussed in the body of the plan, a full description of all performance measures and indicators associated with this plan is provided in Appendix D.

The plan includes a number of measures whose outcomes are influenced by factors beyond the control of a single government agency, like Mn/DOT. An example is roadway fatalities, which include those occurring on the state highway system, as well as county, city, and township roads, and is significantly

influenced by factors beyond Mn/DOT's control, such as driver inattention, intoxication, speeding, and seatbelt use. These measures are included because Mn/DOT believes they are key transportation system performance measures and, although the performance outcomes are not controlled by one organization, the outcomes can be directly or indirectly influenced by government through funding participation, technical assistance, partnership formation, and public outreach activities. Mn/DOT will also track additional measures and indicators beyond those shown in the plan to manage individual transportation system components.

## Policy 1: Traveler Safety



### Summary

#### **Reduce the number of fatalities and serious injuries for all travel modes.**

Mn/DOT will continue to support the Toward Zero Deaths initiative and in cooperation with its partners pursue a comprehensive “Four E” approach to highway safety: Education, Enforcement, Engineering, and Emergency medical services. Engineering improvements will focus on system-wide, cost-effective safety investments on both the state and local roads. Mn/DOT will also continue to monitor air travel safety and will work with the Federal Railroad Administration to monitor and report rail safety.

**1A. TZD and “The Four Es”:** Mn/DOT will continue to support the Toward Zero Deaths (TZD) initiative and its comprehensive approach toward highway safety that targets “The Four Es”: Education, Enforcement, Engineering, and Emergency medical services.

**1B. System-wide, Cost-Effective Safety Enhancements:** Mn/DOT will pursue system-wide, cost-effective safety investments on the state highway system that addresses fatal and severe injury crashes. The types of investments will be data driven and incorporated into all applicable projects.

**1C. Local Road Safety:** State and local road authorities, police, and public health professionals will work together to address safety on the local roadway system.

**1D. Air and Rail Safety:** Mn/DOT will continue to monitor and report air safety. Mn/DOT will also continue to monitor, inspect, and report rail accidents, derailments, safety-related rail infrastructure conditions, and will begin issuing citations for rail safety violations.

### Background and Context

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*Safety is inherent in all policies and is a primary consideration in all work activities.*

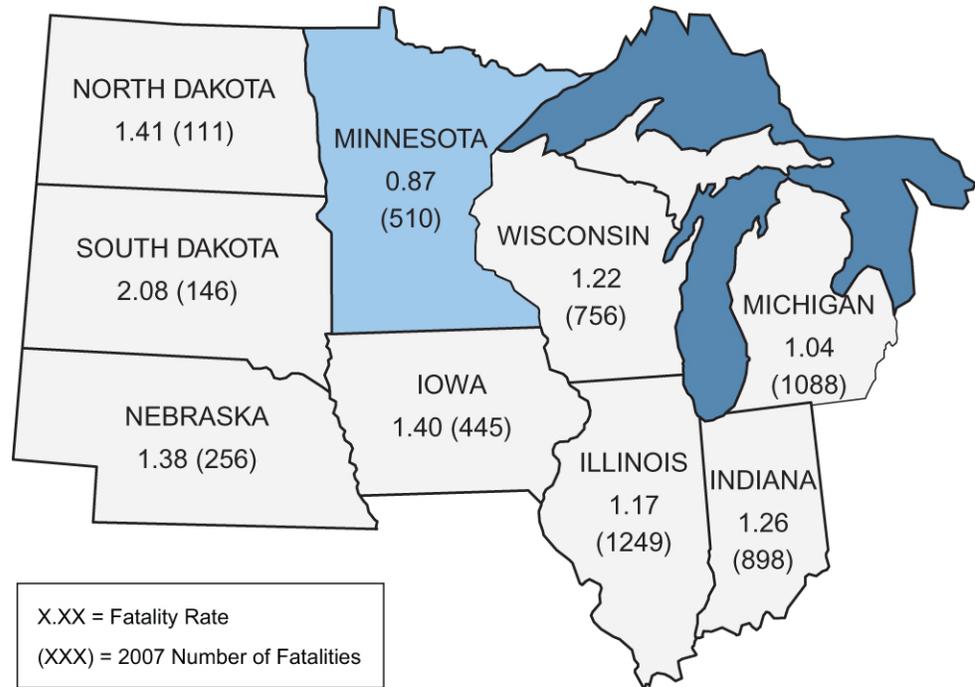
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Transportation users expect safe travel. Accordingly, safety is an objective inherent in all of the Minnesota Statewide Transportation Policy Plan policies and strategies, and it is a primary consideration in all activities transportation authorities undertake. Policy 1 focuses on one part of safe travel, reducing the number of traffic-related fatalities and serious injuries for all modes and users throughout Minnesota.

In the early 1970s, annual highway-related fatalities numbered 53,000 nationwide. Recognized as a public health crisis, efforts such as increased seatbelt use helped lower the number to 39,000 in the 1990s. But since then, an alarming trend emerged; fatalities have steadily increased, peaking at 43,500 in 2005.

The pattern in Minnesota closely matched the national trend until 2003. Since 2003, the number of traffic-related fatalities has dropped significantly in Minnesota. The reductions in Minnesota have been achieved in part through the TZD initiative<sup>1</sup>, which began in 2001. The mission of TZD is “To move Minnesota toward zero deaths on our roads, using Education, Enforcement, Engineering, and Emergency Services.”

These are known as the “The Four Es”. As part of this initiative, Mn/DOT established the number of traffic-related fatalities as the key statewide safety performance measure, and it encouraged cooperation by reaching out to local road authorities, law enforcement, community leaders, and public health professionals as integral partners in statewide safety planning and implementation efforts.



**Figure 7.1.1 Minnesota Highway Fatality Rate as Compared to Neighboring States**

Source: National Highway Traffic Safety Administration, 2007

The safety of Minnesota’s highway system has improved in recent years, yet there were 510 fatalities and over 1,700 serious injuries that still occurred in 2007. To continue progress Toward Zero Deaths and to reduce the number of serious injuries, Minnesota developed a Strategic Highway Safety Plan (SHSP) in 2007. This plan encourages coordination and collaboration amongst stakeholders, identifies areas for targeted safety improvements based on highway crash data, and presents updated safety strategies that reflect new initiatives.

Traffic-related fatalities and serious injuries are also concerns on Minnesota’s rail and air transport systems. This policy addresses safe travel on these systems as well as on streets and highways.

### Strategies

This section describes the strategies that Mn/DOT will use in partnership with other agencies, transportation authorities and companies to support safe travel in Minnesota.

## 1A. TZD and “The Four Es”

*Mn/DOT will continue to support the TZD initiative and its comprehensive approach toward highway safety that targets “The Four Es”: Education, Enforcement, Engineering, and Emergency medical services.*

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*While the recent safety trend is encouraging, data shows that driver behavior continues to be a major factor in crashes.*

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The number of annual fatalities on Minnesota highways has dropped, in part because of TZD initiatives, even as the number of vehicle miles traveled increased for many years. Key changes leading to this result have included improvements in emergency response and medical care, strategic enforcement efforts, and engineering improvements. Engineering changes have included infrastructure improvements targeted to high crash locations and applied systematically on the highway network; continued improvement in vehicle safety including front and side airbags, anti-lock brake systems (ABS), automatic stability control (ASC), improved passenger compartment cages, and roadside assistance; and improvements in monitoring services incorporating global positions system (GPS) and other smart technology.

While the recent safety trend is encouraging, data shows that driver behavior continues to be a major factor in crashes resulting in fatalities and severe injuries. Alcohol consumption, speeding, and failure to wear seatbelts are some of the most harmful and preventable behaviors contributing to fatal and severe injury crashes today. At the same time, driver inattentiveness or distraction is becoming a major factor that corresponds to rises in the proliferation of cell phones and other electronic devices in vehicles. For teens, driver inexperience and inattentiveness are major contributing factors.

Crash data also shows that adult drivers over 65 and teen drivers are over-represented in fatal and severe injury crashes. For example, 15 to 18 year olds make up only seven percent of Minnesota’s total population, yet they represent nearly 15 percent of traffic-related fatalities and serious injuries. Similarly, adults over 65 make up 12 percent of the general population, but account for 20 percent of persons killed in crashes.

Mn/DOT will work with its transportation partners and other stakeholders to address these and other trends by continuing to support actions aimed at preventing crashes altogether and also actions aimed at improving outcomes for those involved in crashes including the following:

- a. Incorporate safety enhancements systematically into state highway and local road projects programmed for construction.
- b. Target law enforcement initiatives toward key areas that are problematic including:
  - Campaigns to reduce impaired driving, aggressive driving, and speeding on all roads like Safe and Sober, and Highway Enforcement of Aggressive Traffic (HEAT).
  - Red-light running and violations of pedestrian crosswalk rules.
  - Enforcement support for commercial vehicle inspections.
- c. Support private health care investments in the emergency trauma care system.

- d. Support educational initiatives including:
- Safe Communities Coalitions and TZD regional efforts.
  - Programs targeted toward high-risk groups that are over represented in fatal and severe injury crashes such as teen and elderly drivers.
  - Work with trucking and agricultural organizations to educate drivers on truck safety regulations and best driving practices.
  - Continue support for education programs to promote rail safety and rail crossing safety, including continued support for national programs, such as Operation Lifesaver.
  - Promote good safety practices in construction and maintenance work zones through Mn/DOT's Work Zone Safety awards program.
  - Work with other transportation agencies and organizations to improve understanding of bicycling and pedestrian crossing rules and compliance.
  - License and train bus drivers including administering the safety, drug and alcohol program through the Rural Transit Assistance Program (RTAP).
- e. Work with railroads to identify and implement railroad crossing safety enhancements such as low-cost improvements to signs and striping, signal upgrades, medians, and quiet zones.



*Enhancements are being made to rail crossings to improve safety.*

- f. Administer the Safe Routes to School program and provide statewide coordination for local transportation agencies.
- g. Continue to improve decision-support systems like crash records, TIS, and vehicle licensing systems as well as the regional transportation management center (RTMC) where state patrol, state highway maintenance, and traffic operations dispatch are collocated. The goal of these improvements will be to provide more timely and accurate information for analyzing crashes as well as targeting highway improvements and enforcement activities.

## 1B. System-Wide, Cost-Effective Safety Enhancements

*Mn/DOT will pursue system-wide, cost-effective safety investments on the state highway system that addresses fatal and severe injury crashes. The types of investments will be data driven and incorporated into all applicable projects.*

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*Seventy percent of fatal crashes occur on rural highways in Greater Minnesota.*

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System-wide investments will be targeted toward the types of crashes that most often result in fatalities and/or severe injuries. Based on analysis and conclusions in the 2007 Minnesota Strategic Highway Safety Plan, Mn/DOT will target its state highway safety investments in Greater Minnesota toward improvements that address run-off-the-road; head-on, cross median and sideswipe crashes; and intersection-related crashes.<sup>2</sup> These types of crashes are typical of those happening on rural highways in Greater Minnesota where 70 percent of Minnesota's fatal crashes occur.

Improvements that address these types of crashes include lower cost safety enhancements like edge-line and centerline rumble strips, cable median barrier, intersection lighting, improved signing and striping, passing lanes, and intersection turn lanes. The implementation of these improvements and others will be discussed and evaluated in detail in forthcoming District Safety Plans that Mn/DOT will prepare for its Greater Minnesota districts.

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*In the Twin Cities Metropolitan Area, safety investments will be targeted toward intersections and areas that have congestion-related safety problems.*

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Mn/DOT also tracks high crash intersections and highway segments throughout the state. These lists are used to help identify problem areas as well as potential solutions. When deemed appropriate and cost effective, design modifications are made to the roadway. In the Twin Cities Metropolitan Area, safety investments will be targeted toward intersections and areas that have congestion-related safety problems.

Mn/DOT will work to systematically identify and cost-effectively implement appropriate safety enhancements on the state highway system through normal maintenance as well as other rehabilitation, replacement, and capacity expansion projects. Mn/DOT will also strive to document the location, date, and the kind of safety enhancement(s) implemented as well as quantify the benefit of the improvements through before-and-after studies.

## 1C. Local Road Safety

*State and local road authorities, police, and public health professionals will work together to address safety on the local road system.*

Approximately 50 percent of Minnesota's annual traffic-related fatalities occur on the local roadway system. If fatalities and serious injuries are to be reduced statewide, the state recognizes that a significant effort needs to be put toward safety on the local roadway system. To continue to work toward more safe local roads, Mn/DOT through its State Aid Office, Office of Traffic, Safety and Technology (OTST), and district offices will continue to partner with local road authorities, police, community leaders, and public health professionals to reduce the number of fatalities and serious injuries on the local road network. These efforts may include, but are not limited to the following:

- a. Work with city and county engineers to identify system-wide, cost-effective strategies and investment options for targeted safety improvements on the local roadway system.

- b. Apply technology, where appropriate, to aid in local enforcement efforts.
- c. Encourage and support interagency cooperation and safety awareness through safety conferences and pilot projects. This should encourage broader participation and involvement from local law enforcement, emergency response, and health care providers.
- d. Encourage local jurisdictions to set, monitor, and report safety performance measures and targets for their own communities.
- e. Encourage local agencies to enhance safety of pedestrian and bicycle systems through Safe Routes to School programs and other enhancement programs.

#### **1D. Air and Rail Safety**

*Mn/DOT will continue to monitor and report air safety. Mn/DOT will also continue to monitor, inspect, and report rail accidents, derailments, safety-related rail infrastructure conditions, and will begin issuing citations for rail safety violations.*

Data shows the number of fatalities in Minnesota related to plane crashes has been decreasing, even as flight hours have increased. Mn/DOT will continue to monitor air safety issues and will continue to work with local airports to provide and maintain the Minnesota Weather Access System (MnWAS) and Automated Weather Station Systems (AWOS). Mn/DOT will also continue to operate and maintain electronic air navigation aids to augment the federal electronic air navigation system in Minnesota.

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*Mn/DOT also began issuing citations in early 2009 for rail safety violations.*

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With respect to rail safety, Mn/DOT will continue to monitor, inspect, and report rail accidents, derailments, and safety-related rail infrastructure conditions. Mn/DOT also began issuing citations in early 2009 for rail safety violations. To support this work, Mn/DOT will begin tracking and reporting train derailments as derailments can be an indicator of quality in railroad maintenance and operations, and can be a public health risk. For example, derailments involving chemical spills may threaten public health. Coinciding with these efforts, Mn/DOT will develop a rail safety plan as a way to target public rail safety efforts.

## Performance Measures and Indicators

Performance measures, indicators, and targets provide quantitative information to transportation authorities and decision makers. This information is tracked over time to monitor safety and investment levels as well as the changes in safety given changes in investment levels. Numerous performance measures and indicators have been either developed or identified for this policy area. Measures in **bold** have been selected as prime examples and are presented in this section. A full description of all performance measures and indicators associated with this plan is provided in Appendix D.

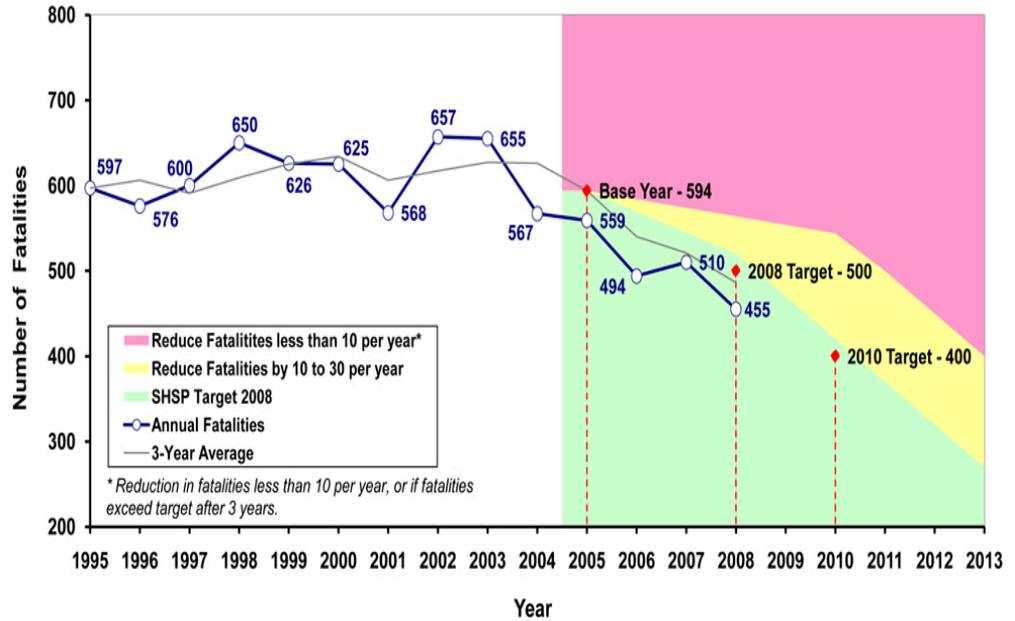
- **Fatalities on All Roads**
- Severe or Incapacitating Injuries on All Roads
- Share of Fatal and Severe or Incapacitating Injuries on Urban and Rural Roads
- Motorcycle-Related Fatalities and Severe or Incapacitating Injuries on All Roads
- Heavy Commercial Vehicle-Related Fatalities and Severe or Incapacitating Injuries on All Roads
- Bicycle- and Pedestrian-Related Fatalities and Injuries
- Railroad Crossing-Related Fatalities and Crashes on all Roads
- Dollars Spent on Highway Safety Improvement Program (HSIP) Stand Alone Safety Projects
- Transit Incidents in the Twin Cities Metropolitan Area
- **General Aviation Fatalities**
- General Aviation Accidents
- Passenger Carrier Safety

### *Developmental Measures*

- Miles of Highway with Edge Treatments
- Greater Minnesota Public Transit Safety
- Train Derailments

### Fatalities on All Roads

This measure was developed as part of the 2003 Statewide Transportation Plan. It tracks the annual number of vehicle-related fatalities on all state and local roads.<sup>3</sup> The number of fatalities on Minnesota roadways between 1995 and 2003 showed an increasing trend. However, since 2003 significant progress has been made in reducing the total fatalities from a high of 655 to 455 in 2008. Figure 7.1.2 shows the fatality trend for all roadways in Minnesota.

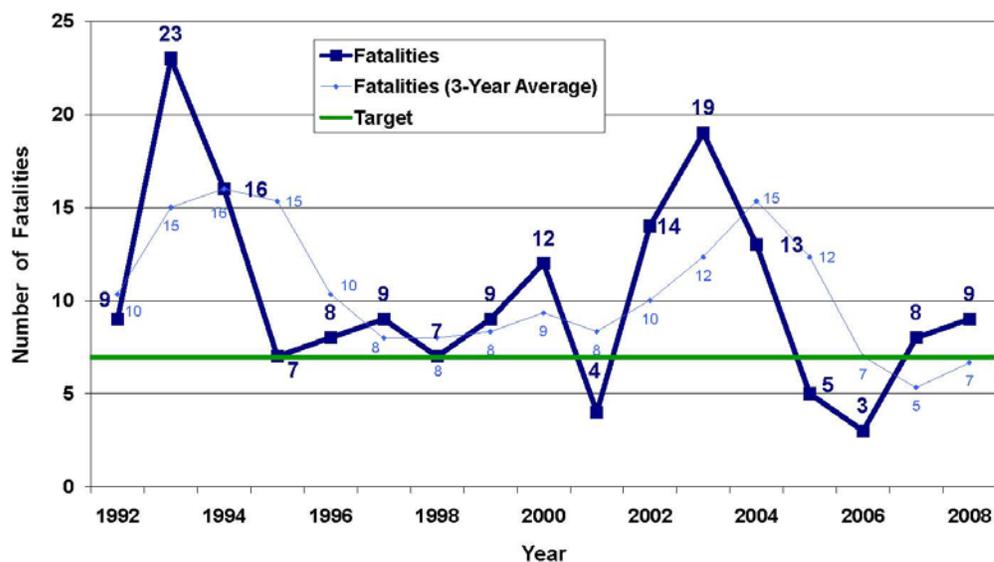


**Figure 7.1.2 Minnesota Roadway Fatalities on All State and Local Roads**

Source: Mn/DOT Office of Traffic, Safety, and Technology

## General Aviation Fatalities

This indicator tracks the annual number of general aviation fatalities as reported and defined by the Federal Aviation Administration (FAA). The National Transportation Safety Board (NTSB) has the responsibility to investigate each aviation crash and determine the cause and corrective actions. The indicator is shown in Figure 7.1.3.



**Figure 7.1.3 Fatalities in General Aviation in Minnesota**

Source: Mn/DOT Office of Aeronautics

- <sup>1</sup> TZD began as a partnership between Mn/DOT, the Minnesota Department of Public Safety (DPS), State Patrol, Federal Highway Administration (FHWA), and the Center for Transportation Studies at the University of Minnesota, but has since grown to include many additional stakeholders.
- <sup>2</sup> Crash types identified through data analysis that showed an over-representation of fatalities and severe injuries. The focus on these crash types may change over time as crash data changes.
- <sup>3</sup> A fatality is defined as a traffic-related injury that results in an unintentional death within 30 days of a crash.



## Policy 2: Infrastructure Preservation



### Summary

**Ensure the structural integrity of the transportation systems serving people and freight.** Mn/DOT will carry out an investment program to repair and replace fracture critical and structurally deficient state highway bridges consistent with the directives of the 2008 Minnesota Legislature. Mn/DOT will continue to work toward achieving established performance targets for the condition of all state bridges, pavements, and other infrastructure. However, given the outlook for future revenues and other competing needs, it is unlikely that all targets will be achieved within the planning period. Mn/DOT will apply cost-effective strategies such as pavement reclamation and preventive maintenance programs to maximize available resources. Mn/DOT will also work with other public and private transportation systems of statewide importance to monitor the condition of their physical assets, identify investment needs, and provide technical assistance where appropriate.

- 2A. State Highway Bridge Conditions:** Mn/DOT will develop and implement a state highway bridge improvement program that is focused on meeting the overall bridge performance targets as well as fulfilling the requirements set forth by the 2008 Legislature.
- 2B. State Highway Pavement Conditions:** Mn/DOT will work toward meeting state highway pavement performance targets while minimizing life-cycle costs.
- 2C. Other State Highway Infrastructure:** Mn/DOT will systematically invest in other highway infrastructure such as drainage, traffic signals, lighting, and safety rest areas.
- 2D. Other Transportation Infrastructure:** Mn/DOT and its partners will monitor, report the condition of, and identify investment needs for key transportation infrastructure that is owned and operated by other jurisdictions and/or private sector companies, including roads, airports, rail, and port facilities.

### Background and Context

Minnesota's transportation system is a complex network of roads, bridges, airports, railroads, ports, and other elements that have been developed over many years. While this system is constantly changing, it is composed of approximately 132,000 miles of roadways with more than 19,000 bridges, 4,500 miles of rail track, 28 major river/lake ports, 136 publicly owned airports, 50 full-service safety rest areas, numerous transit vehicles and routes, and one light rail transit line. This infrastructure has a replacement value in the billions of dollars. Maintaining the structural integrity and hence the functionality and efficiency of these systems is an enormous responsibility that is essential to supporting Minnesota's economy.

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*Infrastructure preservation focuses on capital investments that assure timely replacement of transportation system elements.*

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Like all states, Minnesota faces challenges associated with an aging transportation system, where many components are nearing the end of their design life and need major repairs and/or replacement. In addition, the components face constant deterioration due to use, age, and exposure to the environment.

Within the framework of the overall plan, Policy 2: Infrastructure Preservation, focuses on capital investments that assure timely replacement<sup>1</sup> and preventive maintenance of transportation system elements to maximize utility and maintain lowest life-cycle costs. The transportation infrastructure addressed within this policy area focuses primarily on state highway infrastructure such as highway pavements, bridges, safety rest areas, culverts, and signs. It also addresses the preservation of local road infrastructure as well as that of other travel modes such as airport runways, railroads, transit fleets, and ports.

## **Strategies**

This section contains the strategies that Mn/DOT will use, in partnership with other agencies, organizations, and the private sector, to address transportation system preservation issues.

### **2A. State Highway Bridge Conditions**

*Mn/DOT will develop and implement a state highway bridge improvement program that is focused on meeting the overall bridge performance targets as well as fulfilling the requirements set forth by the 2008 Legislature.<sup>2</sup>*

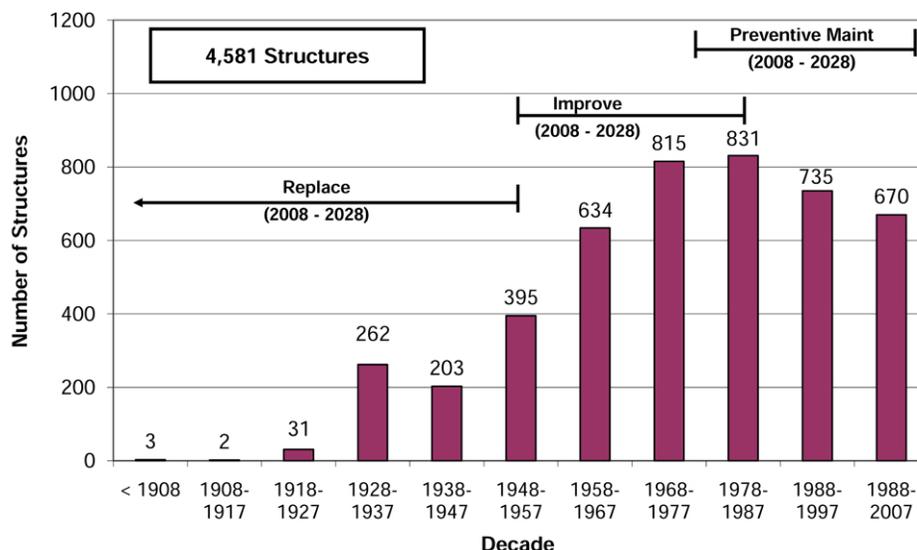
Mn/DOT is responsible for more than 4,500 bridges on the state highway system and these bridges are inspected either on a two-year cycle, or more frequently, depending upon their condition. Through preventive maintenance, rehabilitation, and replacement, the physical condition of Minnesota's bridges, as a whole, has improved in recent years and has met the identified system performance targets. However, a number of large, costly bridges will require replacement over the next 10 years due to their age and condition. Additionally, there are a number of bridges in poor condition that must be managed to ensure public safety.

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*The sizes of bridges being built today are an average of six times as large as their predecessors.*

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Many bridges were constructed during the interstate era, 1950s to 1970s, and are nearing the end of their design life. These bridges, often referred to as the "bridge bubble" or "bridge bulge" as illustrated in Figure 7.2.1, will pose significant financial challenges in the coming years.<sup>3</sup> In addition, the sizes of bridges being built today are on the average six times as large as their predecessors.



**Figure 7.2.1 Age Profile and Investment Strategy of State Highway Bridges**

Source: Mn/DOT Bridge Office

**Requirements of Minnesota Laws 2008, Chapter 152**

The collapse of the I-35W Bridge over the Mississippi River on August 1, 2007, resulted in a re-examination of Mn/DOT’s bridge inspection and preservation programs. The Legislature acted in February 2008 by passing Chapter 152, which provides new revenue and directs Mn/DOT to address specific state highway bridge preservation needs within 10 years based on specific criteria established in the law. Using the criteria set forth, Mn/DOT has identified 133 bridges that will either be replaced, undergo major rehabilitation, or be under contract for these improvements by June 30, 2018, at a preliminary cost estimate of \$2.4 billion. These bridge improvements will also work towards meeting bridge performance targets.

**Existing Bridge Performance Targets**

Mn/DOT has established bridge condition performance measures and targets that apply to the more than 4,500 bridges on the state highway system. While the Chapter 152 bridge program allows for 133 bridges to be rehabilitated or replaced over the next 10 years, Mn/DOT will also be required to make significant investments in the other nearly 4,400 bridges to meet performance targets and minimize life-cycle costs.

Mn/DOT is making changes in its bridge inspection methods and follow-up procedures, it is accelerating its bridge preventive maintenance activities,<sup>4</sup> and it is significantly increasing its investment in bridge rehabilitation/replacement. The focus of these efforts is to limit ongoing bridge maintenance issues and to ensure public safety.

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*Mn/DOT is making changes in its bridge inspection methods and follow-up procedures.*

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## Definition of Terms

*In the aftermath of the I-35W Bridge collapse, the terms structurally deficient and/or fracture critical became part of the public discussion of bridge condition and public policy. It is helpful to have a clear and common understanding of these terms as there is a focus on the bridge program to repair and replace bridges deemed structurally deficient and/or fracture critical.*

### **Structurally Deficient:**

Structurally deficient refers to bridges that have a structural condition rating of 4 or less (deemed to be in poor condition). Structurally deficient means that elements of the bridge need to be more carefully monitored or repaired. The fact that a bridge is deficient, however, does not imply that it is likely to collapse or is unsafe. Most deficient bridges are left open to traffic while undergoing maintenance and repair. It would be expected that a bridge which becomes structurally deficient requires greater maintenance and closer monitoring in the latter stages of its service life. As reflected in the bridge measures and targets, Mn/DOT's objective is to manage the bridge inventory such that no more than 2 percent of the bridge area on principal arterials and no more than 8 percent of the bridge area on non-principal arterials are deemed to be structurally deficient in any given year.

### **Fracture Critical:**

The term fracture critical indicates that if one main component of a bridge of the fracture critical design were to fail, the entire structure could fail. Fracture critical bridges are not necessarily structurally deficient and the designation of fracture critical does not mean the bridges are inherently unsafe. Fracture critical bridges built in the 1980s required more fracture resistant steel as well as a fracture control plan for welding. In Minnesota, the last bridges with a fracture critical detail were built in 1989.

### **Tier 1 Bridges:**

Any bridge that has average daily traffic volume (ADT) greater than 1,000 and has a sufficiency rating at or below 50, or is identified by the commissioner as a priority bridge.

### **Tier 2 Bridges:**

Any bridge that is not a Tier 1 bridge and is classified as fracture critical, or has a sufficiency rating of 80 or below. The legislation calls for the repair or replacement of all Tier 1 and Tier 2 bridges by June 30, 2018.

## 2B. State Highway Pavement Conditions

*Mn/DOT will work toward meeting state highway pavement performance targets while minimizing life-cycle costs.*

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*The number of miles of state highway pavements in “poor” condition is expected to double by 2030.*

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Mn/DOT maintains pavements for approximately 29,000 lane miles of state highways throughout Minnesota. This network moves the majority of people and freight and is critical to Minnesota’s economy. Poor pavement conditions can result in increased costs due to vehicle damage and damage to loads as well as safety problems.

The overall pavement conditions on state highways have deteriorated over the past five years and this trend is expected to continue. In fact, the percentage of pavements in poor condition is expected to double between 2007 and 2012 based on current conditions and planned projects.<sup>5</sup> This trend is primarily due to fewer miles of pavement reconstruction or rehabilitation work that is done.



*This picture shows a roadway with a “poor” pavement condition rating of ride quality index two or less.*

While limited by increasing construction costs and the need to provide a balanced investment program across competing objectives, Mn/DOT will strive to improve pavement performance. To accomplish this Mn/DOT will:

- a. Over the short term, increase the level of investment in pavement reconstruction and rehabilitation over previous levels.
- b. Continue pavement preventive maintenance strategies such as seal coats, joint seals, micro-surfacing, and overlays.
- c. Employ lower-cost fixes such as reclamation<sup>6</sup> to make dollars stretch further and employ cost-effective safety improvements to address safety concerns.
- d. Encourage research activities for the development of new materials, processes, and procedures that gain efficiencies and/or extend life-cycles.
- e. Evaluate innovative contracting methods and assess potential advantages of bundling projects to lower costs.

## **2C. Other State Highway Infrastructure**

*Mn/DOT will systematically invest in other highway infrastructure such as drainage, traffic signals, lighting, and safety rest areas.*

The highway system is comprised of many other infrastructure elements that are important to its overall function. These include traffic signals that control traffic flow at intersections, drainage features which channel, control and filter runoff, lighting which illuminates intersections or roadways to improve visibility and safety, signs which direct and guide motorists, and safety rest areas which afford motorists a safe location to take a break during their trip. All of these infrastructure elements age with time and, as a result, need to be replaced or rehabilitated.

To address these other highway infrastructure needs, Mn/DOT will:

- a. Improve existing systems and/or develop asset management systems for essential system elements including signals, drainage, retaining walls, signage, and safety rest areas. It will use these systems to monitor and track performance trends as well as assist in identifying future capital needs.<sup>7</sup>
- b. Continue to perform preventive maintenance to extend infrastructure life-cycle.
- c. Develop new ways to track and systematically improve electronic traffic management systems including the Regional Traffic Management Centers (RTMC) and Transportation Operations Communication Centers (TOCC).

## **2D. Other Transportation Infrastructure**

*Mn/DOT and its partners will monitor, report the condition of, and identify investment needs for key transportation infrastructure that is owned and operated by other jurisdictions and/or private sector companies, including roads, airports, rail, and port facilities.*

Governmental jurisdictions and private-sector companies are responsible for numerous other transportation networks and infrastructure such as local roads, rail, air, water, and transit networks. These networks and services are critical to the overall transportation system and frequently interface with other system elements. There is a strong public interest in ensuring that these transportation networks remain workable and that agencies and private sector companies are reinvesting in these systems. For this reason, Mn/DOT will:

- a. Work with local transportation authorities to track the condition of the County State Aid Highway (CSAH) pavements.
- b. Work with partners to inspect and report the condition of publicly owned airport pavements in Greater Minnesota. Mn/DOT will work with its local airport partners to guide investment decisions that maintain and preserve airport pavements.
- c. Work with partners to report the condition of the Greater Minnesota and Metro Area transit fleets.
- d. Develop methods for tracking and reporting the condition of Class 1 rail systems and port conditions.

- e. Develop modal investment plans in consultation with its partners. These plans will evaluate the needs of these systems, prioritize investments, and establish implementation roles and responsibilities.

## Performance Measures and Indicators

Performance measures and/or indicators provide quantitative information to managers and/or decision makers. This information will be tracked over time to monitor yearly performance levels. Numerous performance measures and indicators have been either developed or identified for this policy area. Measures in **bold** have been selected as prime examples and are presented in this section. A full description of all performance measures and indicators associated with this plan is provided in Appendix D.

- **Structural Condition of State Highway Bridges**
- **Ride Quality Index (RQI) for State Highway Pavements**
- Remaining Service Life (RSL) for State Highway Pavements
- Physical Condition of Safety Rest Areas
- Remaining Service Life (RSL) for State Highway Signage
- Pavement Condition for Public Airports in Greater Minnesota
- Remaining Service Life (RSL) for Transit Fleets in Greater Minnesota
- Average Bus Age for Metro Transit's Fleet
- Ride Quality Index (RQI) for County Highway Pavements
- Structural Condition for Local Road Bridges

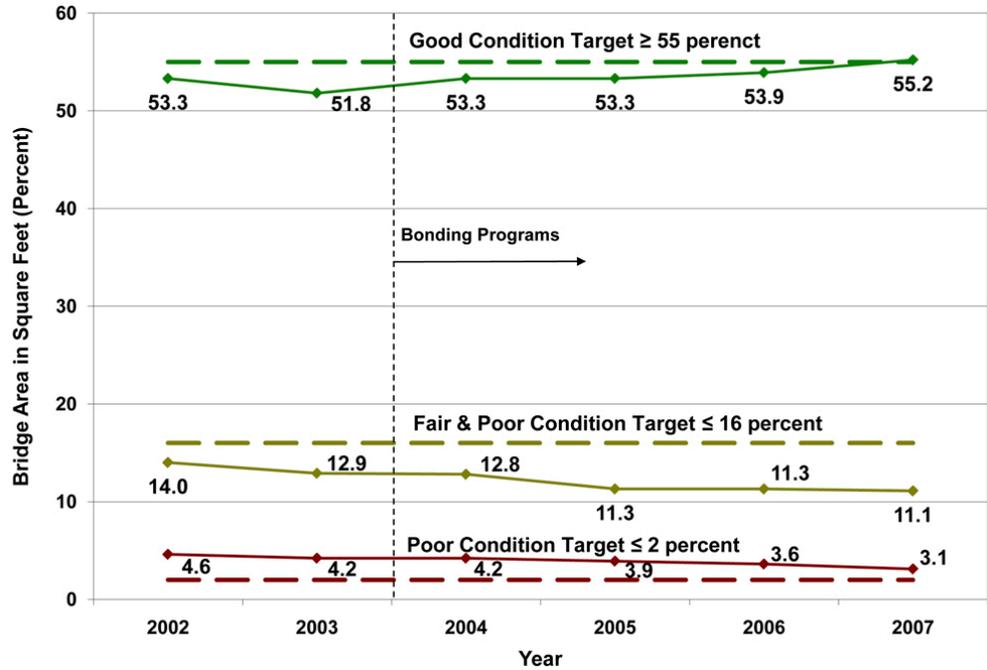
### *Developmental Measures*

- Track Speed on Class 2 and 3 Railroads
- Drainage System Condition
- Condition of State Highway Signals and Lighting
- Port Conditions

### Structural Condition of State Highway Bridges

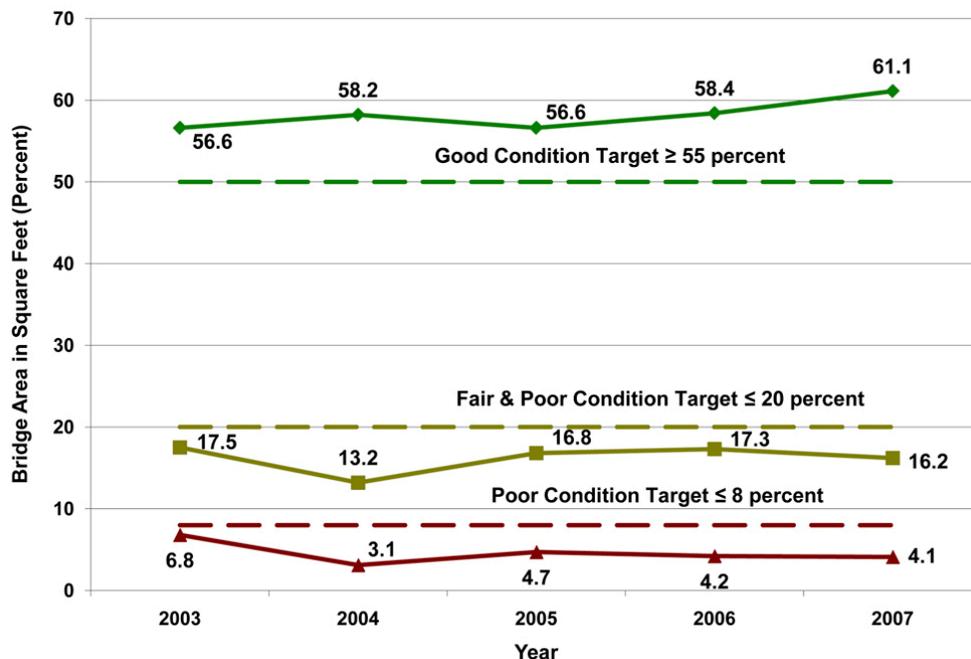
The condition measure for state highway bridges is based on the National Bridge Inventory (NBI) structural condition index.<sup>8</sup> This rating is a measure of the structural integrity of critical bridge elements and is based on a scale of one to nine with nine being the best. The physical condition of Minnesota’s bridges is determined through field inspections. Most Minnesota bridges are inspected on a two-year cycle, with the remaining bridges inspected annually by virtue of their condition. The actual bridge condition system performance measure is based on the percentage of bridge deck area that is in good, fair, and poor categories.<sup>9</sup> The intent is to have a large percentage of bridges deck area in the “good” and “fair” categories and a very small percentage in the “poor” category.

Figures 7.2.2 and 7.2.3 show bridge condition trends for the principal arterial and non-principal arterial highways on the state highway system.



**Figure 7.2.2 Principal Arterial Bridge Condition**

Source: Mn/DOT Bridge Office



**Figure 7.2.3 Non-Principal Arterial Bridge Condition**

Source: Mn/DOT Bridge Office

Based on these system performance measures, bridge conditions have held steady and/or improved slightly in recent years. As a percentage of total bridge deck area, principal arterial and non-principal arterial bridges in “good” condition have both increased since 2003. Principal arterial bridges surpassed the target of 55 percent in both 2006 and 2007, while non-principal arterial bridges have consistently met targets for the past 5 years. The recent upward trend is largely a result of bridge replacement and system expansion.

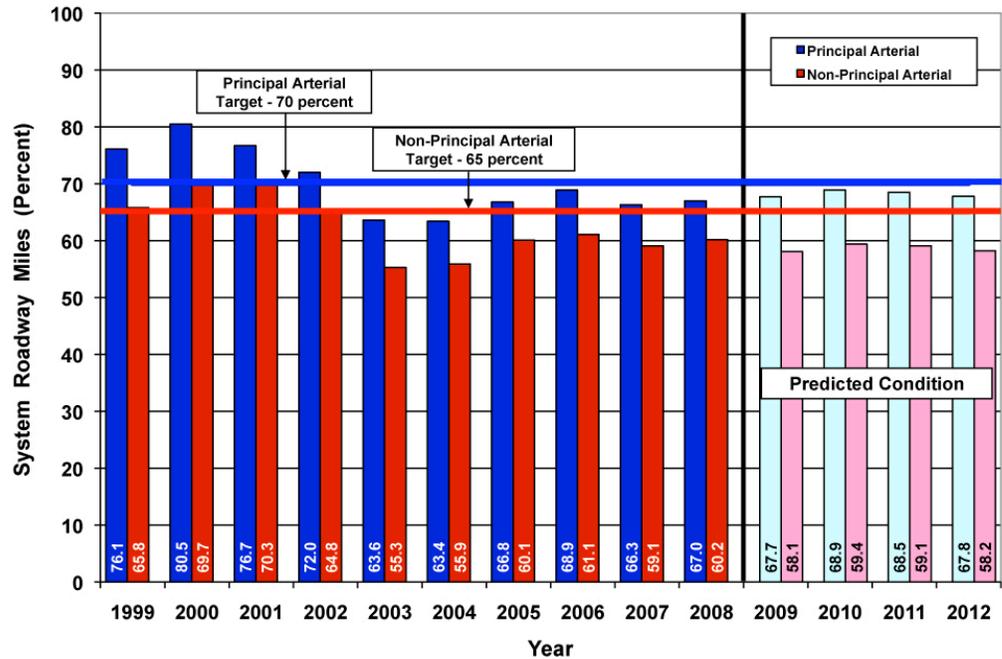
The percent of total deck area in the combined “fair” and “poor” category has been steady or decreasing (improving) since about 2002 and continues to meet the targets for both principal and non-principal arterial bridges.

Bridge deck area in “poor” condition (structurally deficient) has been fairly steady for both principal and non-principal arterial bridges. In 2007, principal arterial bridges failed to meet targets for the percentage of system in “poor” condition, while non-principal arterial bridges met targets. When measured in terms of bridges, rather than bridge deck area, there has been improvement. The number of structurally deficient bridges has fallen from 121 in 2002, to 94 in 2006. The percentage of bridge deck area in poor condition will begin to improve as larger bridges are programmed for replacement in the short term.

### Ride Quality Index for State Highway Pavements

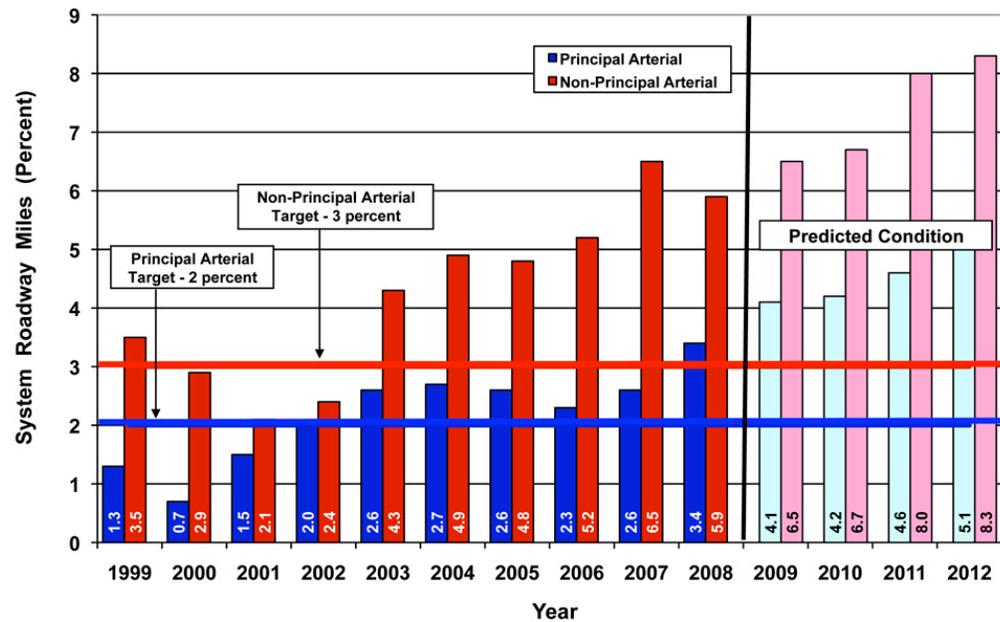
The condition of state highway pavement condition is measured by the Ride Quality Index (RQI). The RQI is Mn/DOT’s assessment of ride smoothness and is measured on a scale of zero to five with five being the best. The objective is to provide a smooth ride (good condition = rating of three or better) for a large percentage of the state highway system and limit the number of miles that have a rough ride (poor condition = two or less). The pavement measures have been broken into two subsets of state highways – one for principal arterials (roadways that have the highest levels of traffic and connect major trade centers), and one for non-principal arterials (all other state highways).

Figures 7.2.4 and 7.2.5 show the pavement condition trends for both principal arterials and non-principal arterials. The performance trend shows that the percentage of “good” pavements has declined while the percentage of “poor” pavements has increased. Based on the pavement model, this trend is expected to continue with the present level of transportation funding.



**Figure 7.2.4 Percentage of State Highway System in Good Condition**

Source: Mn/DOT Office of Materials Services



**Figure 7.2.5 Percentage of State Highway System in Poor Condition**

Source: Mn/DOT Office of Materials Services

<sup>1</sup> In contrast, Policy 3: System Maintenance and Security address system operations and maintenance activities that optimize the operations of the elements of the transportation system.

<sup>2</sup> Minnesota Laws 2008, Chapter 152.

<sup>3</sup> The annual funding needs for state highway bridge preservation will rise to \$145 million in current dollars in the 2024 to 2030 time frame.

<sup>4</sup> Bridge inspection, inspection follow-up, and preventive maintenance are discussed in Policy 3: Maintenance and Security.

<sup>5</sup> Based on assessment using Mn/DOT’s pavement management model.

<sup>6</sup> Reclamation is a form of pavement rehabilitation in which old asphalt and base materials are pulverized and compacted to produce a strong, durable base for either an asphalt or concrete surface. Reclamation projects often have a more limited scope and, therefore, lower costs than a traditional reconstruction project and can be a good option for lower volume roads with adequate capacity.

<sup>7</sup> Mn/DOT is in the process of developing drainage data (HYDINFRA), sign management (SignTrk), and safety rest area management systems.

<sup>8</sup> The National Bridge Inventory (NBI) structural condition rating index is used for rating the physical condition of bridges and culverts with a deck span of 20 feet or longer.

<sup>9</sup> Scores of four or less are poor, five and six are fair, and seven through nine are good. System percentages for the three different categories are determined by aggregating individual bridge ratings together. Individual bridge ratings are weighted by the size of the bridge (square feet of bridge deck). The total square feet in each category is then compared to the total square feet of bridge deck in the entire system. This is done for both principal and non-principal roadways.



## Policy 3: Maintenance and Security



### Summary

**Maintain and operate the statewide transportation system in an efficient, cost-effective, and secure manner.** Mn/DOT will utilize the increase in operating funds provided through the 2008 Minnesota Legislature to address high priority maintenance needs, including snow and ice removal; bridge, pavement, and drainage maintenance; and safety and traffic operations. Mn/DOT will revamp its bridge inspection process to meet new federal requirements, document follow-up procedures to improve the effectiveness of the bridge inspection program, and emphasize preventive maintenance to ensure public safety and extend bridge life. Mn/DOT will continue to pursue a wide range of opportunities to share costs, resources, and best practices with its transportation partners and thereby achieve efficiencies across systems.

- 3A. Bridge Inspection, Follow-up, and Preventive Maintenance:** Review and modify bridge inspection processes and follow-up procedures, and implement bridge preventive maintenance strategies that ensure public safety and extend overall bridge life.
- 3B. Level of Highway Maintenance:** Staff and fund maintenance and operations to address high-priority areas including snow and ice removal, pavement patching, drainage, safety, and traffic operations needs.
- 3C. Efficiencies Across all Jurisdictions:** Work to advance efficiencies in maintenance operations through innovation, partnering, and cost-sharing.
- 3D. Maintenance of Other Modes:** Other public and private transportation partners should maintain their respective transportation infrastructure.
- 3E. Security:** Maintain the security of the state's road, rail, waterway, and aviation systems.

### Background and Context

Maintaining the transportation system is critical to the safety and mobility of the traveling public. This policy focuses on both preventive and reactive maintenance activities as well as ensuring transportation infrastructure security. These activities not only keep the system operating in all weather and traffic conditions, but are central to extending infrastructure life and lowering overall ownership costs as well. This is especially important as much of the highway system is aging and nearing the end of its design life.

The transportation system has many parts that must not only physically connect at a system level but also work together at an operational level (e.g., signal timing, plowing activities, etc.). In 2005, Mn/DOT developed the first Highway Systems Operations Plan (HSOP), which included a formalized process for developing and

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*These activities keep the system operating in all weather and traffic conditions and are central to extending infrastructure life and lowering overall ownership costs.*

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tracking the performance of key maintenance and operations activities within Mn/DOT. The HSOP resulted in an annual transfer of over \$8 million from the state road construction budget to the operations and maintenance budget from fiscal year (FY) 2006 to FY 2009. Most of these funds are targeted toward pavement reactive maintenance (pavement patching) and bridge preventive maintenance activities. In addition to this funding, the 2008 Minnesota Legislature passed a new transportation funding bill, Chapter 152, that designated \$41 million to operations and maintenance starting in FY 2009.

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*Many of the transportation facilities interface with one another, and a high level of coordination is required to ensure seamless operations.*

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As a general rule, each jurisdiction and/or facility owner has the responsibility for maintaining and operating their own infrastructure (e.g., highways, rail, pedestrian, transit, bicycle, and ports). However, many of the transportation facilities interface with one another, and a high level of coordination is required to ensure seamless operations. For example, it does not make sense for a local jurisdiction to plow their roads within two hours of a storm event if the regional system is not plowed in a similar timeframe.

Another element to this policy area is transportation infrastructure security. Transportation security is an issue that has become more important since the tragic events of 2001. This area is complicated by the large number of factors influencing it, including multiple jurisdictions as represented by individuals, businesses, agencies, and governments. The security issue is present in both public and private transportation services and infrastructure. The focus of the discussion in this policy pertains to the security of public transportation services and infrastructure including critical highway, transit, passenger rail, water, and air infrastructure and services.

## **Strategies**

All transportation infrastructure requires maintenance to not only extend its life but also to maintain safety and operational functionality. In addition, critical infrastructure needs to be secure to provide safe and predictable travel. The following strategies have been identified to address these areas.

### **3A. Bridge Inspection, Follow-up, and Preventive Maintenance**

*Review and modify bridge inspection processes and follow-up procedures, and implement bridge preventive maintenance strategies that ensure public safety and extend overall bridge life.*

Significant scrutiny was focused on Mn/DOT bridge inspection and maintenance activities following the I-35W Bridge collapse. Based on these investigations and analysis, significant changes will be made to the Mn/DOT's bridge inspection and maintenance programs. These changes are intended to improve inspection practices as well as maintenance and follow-up activities. Mn/DOT specifically will implement the following strategies:

- a. Review and enhance, where appropriate, the state's bridge inspection programs to ensure personnel are well-trained and have the proper equipment. Complete all scheduled inspections annually and report conditions for all state highway bridges.

- b. Establish processes to identify and prioritize bridge maintenance needs from bridge inspection reports. Improve linkages between bridge work repairs and condition reporting programs (e.g., potential link between WMS and PONTIS). Also investigate enhancements to bridge management systems to link different investment strategies to life-cycle cost elements.
- c. Give priority to bridge preventive maintenance activities as outlined by HSOP (e.g., joint repairs, deck flushing, crack sealing, deck and rail sealing, and spot painting) to extend bridge life and lower long-term ownership costs.
- d. Prioritize and complete other bridge maintenance activities as needed to maintain structural integrity and safety (e.g., structural damage, pavement spalling, bearing adjustments, section loss).
- e. Provide greater access to bridge condition and bridge system performance information, and provide regular status reports to legislature on bridge maintenance and replacement programs.

### 3B. Level of Highway Maintenance

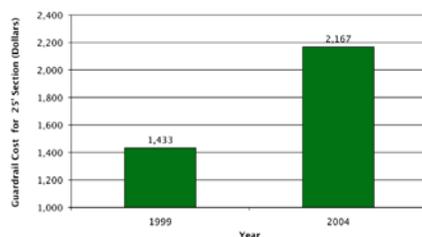
*Staff and fund maintenance and operations to address high-priority areas including snow and ice removal, pavement patching, drainage, safety, and traffic operations needs.*

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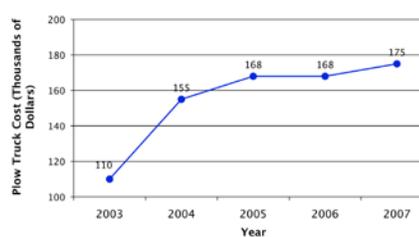
*The cost of highway maintenance has grown over time and this is anticipated to continue.*

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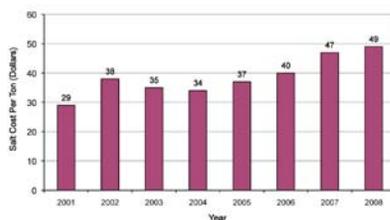
The cost of highway maintenance has grown over time and this is anticipated to continue. This is due to, among other things, an aging highway system, deteriorating pavement conditions, and increasing costs for fuel, equipment, and materials. Additionally, the system has become more complex in order to address safety, mobility, and/or environmental regulations. For example, drainage systems have become more sophisticated with ponds and treatment areas to ensure runoff is filtered before discharging to other water bodies. Numerous miles of cable median barrier have been installed to prevent serious cross-median crashes. More signals and lighting have been installed to improve traffic flow and safety. All of these systems require maintenance.



**Guardrail Cost**



**Plow Truck Cost**



**Salt Cost**

*These figures provide examples of the cost increases that transportation agencies face annually as they maintain and operate a large, complex system.*



*Bridge anti-icing systems help reduce safety issues on bridge decks.*

Mn/DOT will increase the level of resources for maintenance and operations to address ongoing highway system needs including:

- a. Placing a high priority on maintenance activities that directly affect the user and user safety, including snow and ice removal, pavement patching, guardrail replacement, enhancements to pavement markings and signing, and increased signal and lighting maintenance. Maintenance levels will also be increased in rest areas or other areas that receive a high level of public use.
- b. Expanding capability to monitor maintenance performance, assess maintenance needs, and manage maintenance costs consistent with direction set by the HSOP. This would include completion of the drainage database, Hydinfra, as well as ways to track and report the condition and maintenance of signs, guardrails, rest areas, signals, and lighting.
- c. Evaluating staffing needs with careful consideration of staffing needed to meet performance targets, resulting impacts on program delivery, and the level of use of temporary employees.

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*Mn/DOT has developed and deployed many innovative processes and products that have increased efficiencies and reduced overall maintenance costs.*

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### **3C. Efficiencies Across all Jurisdictions**

*Work to advance efficiencies in maintenance operations through innovation, partnering, and cost-sharing.*

Mn/DOT has developed and deployed many innovative processes and products that have increased efficiencies and reduced overall maintenance costs. These activities are critical to providing maintenance for an ever-changing, more complex system. Examples include numerous changes in snowplow equipment and truck technology and the application of de-icing materials to increase efficiencies. Mn/DOT has also made significant efforts to partner with local transportation agencies to share work space and equipment and has recently experimented with sharing of plow routes. Mn/DOT will work to advance efficiencies in maintenance by doing the following:

- a. Pursue innovation in technology and best practices, including:
  - Use of automatic vehicle location, maintenance decision support systems, Tow Plow (an innovative plow configuration), pavement temperature sensors, and spreader calibration in snow and ice removal.
  - Explore use of fuel purchase hedging to achieve greater cost stability.

- Continue to investigate new, cost-effective materials and methods that improve functionality and reduce maintenance operation costs. Examples include pavement markings with improved visibility, especially at night and in wet weather conditions, and better overhead lamps that use less electricity and reduce the frequency of re-lamping.
  - Continue to consider maintenance costs when developing new designs or material standards such as those for the cable median barriers.
  - Evaluate potential for greater equipment sharing with strong consideration toward meeting performance targets.
  - Continue to encourage Mn/DOT's Best Practices program that identifies cost-effective processes and practices for implementation statewide.
- b. Develop or strengthen partnerships and cost-sharing arrangements. Examples include:
- Explore opportunities with cities and counties to increase maintenance efficiencies through shared facilities, equipment, and routes.
  - Take steps to increase restitution recovery for guardrails (i.e., increase the frequency of "yellow tags" by working more closely with local law enforcement and using technology to identify who is responsible for damage).
  - Continue to group maintenance activities into large group contracts to maximize efficiency and minimize staff. Examples include electrical and re-lamping work.
  - Expand maintenance activities to include preventive maintenance work; consider pooling preventive maintenance work with cities and counties.
  - Optimize work between Mn/DOT crews and contract maintenance; expand use of safety rest area contractors where possible.

### 3D. Maintenance of Other Modes

*Other public and private transportation partners should maintain their respective transportation infrastructure.*

Maintenance of other transportation infrastructure in Minnesota is also a concern. For example, a significant maintenance issue has emerged at the Port of Duluth where unusual corrosion of the steel sheet piling throughout the Duluth Superior harbor is occurring. To ensure Minnesota's entire transportation infrastructure is maintained, transportation authorities should pursue the following:



*Rail conditions are important to moving grain, coal, and other bulk materials.*

- a. Mn/DOT will work with rail companies to address maintenance at railroad grade crossings including traffic safety signals and signage and to better define inspection and maintenance responsibilities for the 60 Mn/DOT-owned railroad bridges over state highways.<sup>1</sup>
- b. U.S. Army Corps of Engineers should continue to maintain the Mississippi River channel including yearly dredging and keeping the locks and dams in good working order. It should also continue to work with the Port of Duluth to stabilize and maintain Port of Duluth dock structures.<sup>2</sup>



*Airport pavement condition is important to aviation safety.*

- c. Local road authorities should work with Mn/DOT to improve maintenance and signage on designated highway freight routes and port connectors.
- d. Transportation agencies should ensure that bicycle and pedestrian facilities are maintained year round, including summer maintenance, and snow and ice removal where appropriate.<sup>3</sup>
- e. Local municipalities will continue to be responsible for maintaining and operating publicly owned airports. Mn/DOT will assist through the administration of the Airport Maintenance and Operations Grant program and through administration of the statewide airport re-striping contract.<sup>4</sup>
- f. Transit operators should continue to do preventive maintenance work to extend equipment life cycles.
- g. Mn/DOT and the Metropolitan Council will continue to work together to address maintenance of light rail transit (LRT) systems.<sup>5</sup>

### **3E. Security**

*Maintain the security of the state's roads, rail, waterway, and air service systems.*

Operating a secure transportation system is important to all citizens, businesses and transportation agencies. Security measures are evolving for many parts of the transportation infrastructure. These will continue to evolve as security tactics and technology change. The provision of a secure system requires effort from many partners including law enforcement, transportation agencies, and private companies.

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*Mn/DOT will review and update security plans and procedures to protect and maintain the state's critical infrastructure.*

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Mn/DOT will periodically review and update its security plans and procedures to protect and maintain the state's critical infrastructure. These plans will ensure that proper coordination occurs with other agencies and that individual and organizational training takes place to prepare for potential incidents. It will also provide for a liaison to the federal, state and local emergency response community. Additionally, Mn/DOT will ensure that countermeasures are developed to address areas that have been identified as having higher risk.

This plan will also encourage private sector transportation providers (i.e., rail, water, and ports) as well as other agencies to have their own security plans and procedures.

## Performance Measures and Indicators

Performance measures, indicators, and targets provide quantitative information to transportation authorities and decision makers. This information is tracked over time to monitor maintenance and investment levels as well as the changes in maintenance given changes in investment levels. Numerous performance measures and indicators have been either developed or identified for this policy area. Measures in **bold** have been selected as prime examples and are presented in this section. A full description of all performance measures and indicators associated with this plan is provided in Appendix D.

- **Bridge Inspection**
- **Bridge Reactive Maintenance**
- **Bridge Preventive Maintenance**
- **Snow and Ice Removal**
- Pavement Patching
- Pavement Markings Meeting Life Expectancy and Retro-Reflectivity Standards
- Customer Satisfaction with State Highway Maintenance

### *Developmental Measures*

- Road Drainage Infrastructure Maintenance and Repair
- Guardrail and Median Barrier Repair
- Retro-Reflectivity of Pavement Markings
- Traffic Signal, Lighting, and ITS Maintenance

### **Bridge Inspection**

National Bridge Inspection Standards (NBIS) requires inspections to be conducted within 24 months of the most previous inspection. Mn/DOT requires more frequent inspections for bridges in poor condition. Mn/DOT utilizes a standardized bridge inspection maintenance assessment for inspections. Bridge inspection progress was first reported at Mn/DOT in early 2009.

### **Bridge Reactive Maintenance**

The 2008 Legislative Auditor Report recommended that Mn/DOT establish standard procedures for documenting, communicating, and following up on bridge inspectors' maintenance recommendations. This measure will report the percentage of high priority reactive maintenance projects completed. High priority reactive maintenance includes items that are hazards to the public and items that may degrade quickly to impact the safe function of a bridge. A standardized bridge maintenance planning spreadsheet is being used for prioritizing maintenance needs and reporting completion of required reactive bridge maintenance repairs.

### Bridge Preventive Maintenance

Preventive bridge maintenance activities extend bridge life and lower long-term ownership costs. Activities include joint repairs, deck flushing, crack sealing, deck and rail sealing, and spot painting. Preventive maintenance activities only apply to bridges with decks having a NBIS rating of 6 or above; and only to elements in fairly good condition (elements in poor condition should be scheduled for reactive maintenance). Preventive maintenance is scheduled based on inspected element condition ratings and guidelines.

### Snow and Ice Removal

Enhancing the safety of Minnesota’s roads for the traveling public is the primary goal of Mn/DOT’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. Snow and ice management can also greatly reduce congestion caused by weather events.

This performance measure tracks whether the target regain time (the time when bare lane is achieved following a weather event) was met or exceeded for each plow route for each event. These route specific figures are aggregated over an entire winter season. A draft target has been established stating that target regain be met over the winter season 70 percent of the time.

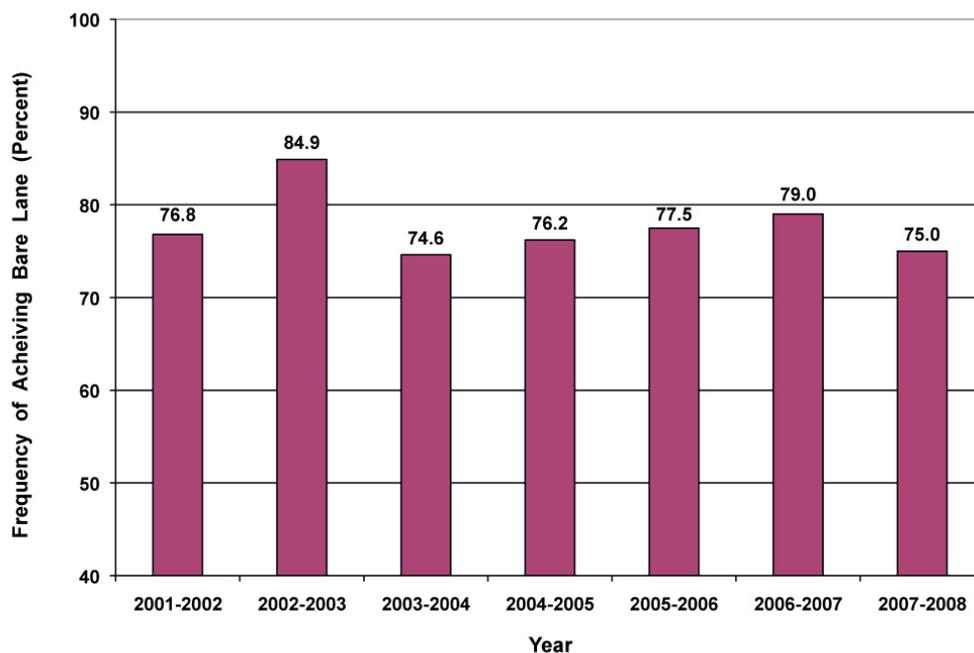
Targets are also set for the number of hours after a weather event ends before bare lane is achieved for five specific roadway categories. The targets set for the overall system and five types of roadways are shown in Table 7.3.1.

**Table 7.3.1 Target Clearance Times for Snow and Ice Removal**

Roadway Category	Average Daily Traffic	Target Clearance Time	2007 - 2008 Average Clearance Time
Super Commuter	Over 30,000	0 to 3 hours	2.5 hours
Urban Commuter	10,000 - 30,000	2 to 5 hours	5.3 hours
Rural Commuter	2,000 - 10,000	4 to 9 hours	6.9 hours
Primary Collector	800 - 2,000	6 to 12 hours	8.2 hours
Secondary Collector	Under 800	9 to 36 hours	12.9 hours

Source: Mn/DOT Office of Maintenance

Historically, Mn/DOT has met established clearance time targets for all five roadway categories in most years. As a result, Mn/DOT has exceeded the draft target for the past seven winters as displayed in Figure 7.3.1. The most recent winter season for which data is available, 2007-2008 winter season, the target clearance time was met 75 percent of the time.



**Figure 7.3.1 Frequency of Achieving Bare Lane within Targeted Number of Hours - All Classifications**

Source: Mn/DOT Office of Maintenance

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- <sup>1</sup> Mn/DOT owns approximately 60 railroad bridges in the state serving as highway overpasses on state highways (the other 50 or so are owned by the railroads). The railroads maintain the track and roadbed structure on the bridge, and normally include these bridges in their private bridge inspection rotations. Mn/DOT also inspects these structures regularly and performs routine maintenance.
  - <sup>2</sup> The U.S. Army Corps of Engineers dredges the river yearly to maintain at least a nine foot deep channel for towboats and loaded barges to carry their cargo throughout the navigable rivers of the United States. The Corps of Engineers also controls all 29 locks and dams on the Upper Mississippi River, and does annual maintenance to keep the locks in good functioning order. They also maintain the Duluth Superior Port to 27-foot depth.
  - <sup>3</sup> Maintenance and operations of most bicycle and pedestrian paths and trails are a local government responsibility. These facilities need to comply with the Americans with Disabilities Act of 1990 (ADA).
  - <sup>4</sup> Mn/DOT administers Airport Maintenance and Operations Grants to assist 136 municipalities in performing routine maintenance such as snow plowing, pavement patching and crack sealing at publicly owned airports in Minnesota.
  - <sup>5</sup> Maintenance of the LRT system on state right-of-way as outlined in the agreement between Mn/DOT and the Metropolitan Council.



## Policy 4: National and Global Connections



### Summary

**Maintain and strengthen Minnesota's strategic multimodal connections to the Upper Midwest, the nation, and the world.** Over the past 15 years Minnesota's economy has become more global. Maintaining viable multimodal transportation connections to and from adjacent states, as well as gateways to the rest of the world, has become critical to the state's economic future. Because these connections rely on infrastructure beyond Minnesota's borders, Mn/DOT will continue to work with neighboring states and federal agencies to maintain and improve national and international transportation linkages that are important to Minnesota. Mn/DOT will also continue to work with private industry providers such as air, rail, and waterway transport to identify approaches that will support maintaining strong national and international transportation connections to Minnesota for people and freight.

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*Mn/DOT will continue to work with neighboring states and federal agencies to maintain and improve national and international transportation linkages that are important to Minnesota.*

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- 4A. Public Roles in Rail and Water Transport:** Mn/DOT will evaluate Minnesota's rail and port systems, identify state investment priorities, define potential implementation roles and responsibilities, and promote coordination among industry partners.
- 4B. Partnerships in Highway, Rail, and Water Transport:** Mn/DOT will continue to work with private organizations, multistate and national groups, as well as Minnesota's congressional delegation to support national policies and projects that are critical to Minnesota's economy.
- 4C. Minnesota Air Transport:** The Metropolitan Airports Commission, the Metropolitan Council, Mn/DOT, and other agencies will work to strengthen Minnesota's national and global air transport system, including maintaining the Minneapolis-Saint Paul International Airport as a major passenger hub.
- 4D. Performance Measures:** Mn/DOT will develop and monitor performance indicators useful in communicating the health of Minnesota's national and global connections.

### Background and Context

National and global connections support business and recreational travel as well as the export and import of freight beyond Minnesota's borders. These links are essential in Minnesota's national and global competitiveness, and are critical to the state's current and future economic strength. Minnesota's economic strength has long been recognized, as evidenced by more than 19 Fortune 500 companies and 32 Fortune 1,000 companies that presently call Minnesota home, including Medtronic, UnitedHealth Group, Cargill, 3M, Target, General Mills, and Best Buy. In addition to these companies, renowned institutions, such as the University of Minnesota and Mayo Clinic, along with hundreds of other colleges, universities, and medical organizations are located in Minnesota. These organizations and thousands of others

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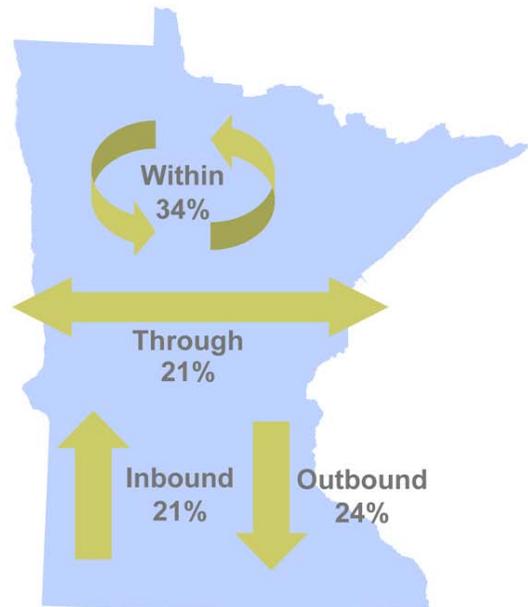
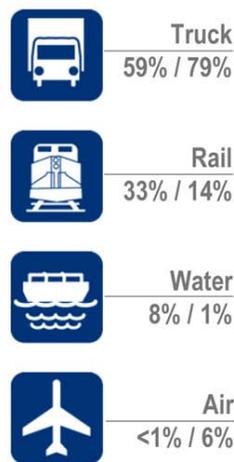
*Canada and the states in the Upper Midwest continue to be Minnesota's largest trading partners.*

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need competitive access to the Upper Midwest, the nation, and the world to provide services, share expertise, and to gather and distribute raw materials and products.

National and global connections are increasingly important to Minnesota's economy. Although Canada and the states in the Upper Midwest continue to be Minnesota's largest trading partners in terms of freight, recreation opportunities, and population migration, Minnesota's connections extend much further than the region. Minnesota is home to a substantial immigrant population and exports goods and products to nearly 200 countries around the world. These links drive the nearly 500,000 landings and takeoffs annually at Minneapolis-Saint Paul International Airport, which serves more than 35 million passengers, most from points outside Minnesota.<sup>1</sup> Also, as a result of the national and global connections, Figure 7.4.1 shows how two-thirds of all freight tonnage transported in Minnesota crosses the state border.

**Freight Mode by Weight / Value**



**Figure 7.4.1 Freight Mode by Weight/Value in 2001**

Source: Mn/DOT Office of Freight and Commercial Vehicle Operations

These connections will become more important as the economies of China, India, and other countries expand. Nationally, imports and exports continue to grow and are predicted to represent 35 percent of the nation's Gross Domestic Product (GDP) by 2020 and 60 percent by 2030.<sup>2</sup> Tapping into business opportunities in these large, emerging markets and expanding domestic markets is critical to Minnesota's continued economic growth and high quality of life.

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*Minnesota relies on a number of national and international connections to support its economy.*

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Minnesota relies on a number of national and international connections to support its economy. Minnesota has access to two major waterways, the Great Lakes - St. Lawrence Seaway system and the Mississippi River system. In addition, a well-developed network of railroads links Minnesota with the east, west, and Gulf coasts as well as Canada and Mexico. Because of these advantages, a higher percentage of Minnesota's freight is moved by water and rail compared to the national average.<sup>3</sup> Passenger air service, primarily through the Minneapolis-Saint Paul International Airport, provides strong ties to national and international destinations as well. However, while rail, water, and air provide important service to segments of

Minnesota's economy, the interstate and state highway systems carry the majority of people and freight in Minnesota. For example, the highway system moves 59 percent of freight by weight and 79 percent of freight by value.<sup>4</sup>

The economic competitiveness of Minnesota depends on an integrated, multimodal system of transportation – highway, rail, water, air, and intermodal terminals – that offers safe, reliable, and cost-effective access to national and international markets for people and freight.

## Strategies

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*Modal systems must be able to respond to shifting global trade patterns, changing supply chains, and emerging markets.*

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Maintaining access to distant markets requires an efficient multimodal transportation system that is capable of responding to shifting global trade patterns, changing supply chains, and emerging markets for Minnesota services, imports, and exports. The current system is owned, maintained, and operated by a mix of private companies and public agencies. Strategies for maintaining and improving the transportation system need to appropriately consider the forces influencing these organizations and the markets they serve. The following strategies focus on providing robust national and global transportation connections.

### 4A. Public Roles in Rail and Water Transport

*Mn/DOT will evaluate Minnesota's rail and port systems, identify state investment priorities, define potential implementation roles and responsibilities, and promote coordination among industry partners.*

Minnesota's rail and waterway systems presently transport freight, primarily over longer distances, typically 600 miles or more. However, with energy prices rising and highway and airport congestion growing, many people are asking whether there is a role for the state to play in today's rail and waterway transport systems. For example, public interest is rising in alternative passenger transport, via traditional or high-speed rail to connect major population centers like the Twin Cities to Chicago. This is evidenced by stable, maximum capacity ridership on Amtrak and added service via Mega Bus. Another example is that intermodal (rail-truck) container traffic is forecast to double or triple by 2015<sup>5</sup> and being driven by increasing demand for consumer products and other goods.



*Water and rail systems generally support movement of bulk materials over 600 miles or more.*



*Access to intermodal container yards is hampered by their location in highly urbanized areas susceptible to congestion.*

Although interest in rail and waterway transport is rising, critical issues need to be addressed. For example, high volume rail corridors that support freight and passenger rail may experience service conflicts as rail traffic levels increase. Short-line railroads, which provide Minnesota regions with access to national railroad networks, are under increasing pressure to upgrade facilities. As national markets and logistics have changed over time, short-line railroads have been required to upgrade sidings and loading capacities to support the shift away from local grain elevators to larger elevators that can accommodate unit trains. To meet future needs, short-line railroads will require significant capital investment to upgrade the load-carrying capacity of tracks and bridges. Container handling in Minnesota is constrained because the state's only three intermodal container terminals are older, capacity-limited facilities, and highway access to the terminals is hampered by their location in highly urbanized areas susceptible to congestion.<sup>6</sup>

To address these trends, Mn/DOT will work with its industry partners, including shippers, carriers, regional authorities, and port authorities, to do the following:

- a. Continue to invest in rail and port infrastructure. Mn/DOT will aid in this effort by continuing to administer the Minnesota Rail Service Improvement (MRSI)<sup>7</sup> and Port Development Assistance<sup>8</sup> programs, supporting the 2008 federally authorized program for improvements to inland waterways, and continuing to ensure that these investments are cost-effective.
- b. Develop a Minnesota freight and passenger rail plan. The plan will create a vision for both passenger and freight rail services in Minnesota, establish investment needs, identify a potential passenger system network, determine the role of private and public sector entities, set parameters for corridor priorities, and identify potential funding sources. The plan will comply with expected federal state rail plan guidelines and requirements in order to expedite development and funding for proposed and future projects. This Statewide Transportation Policy Plan will be amended with the findings from the rail plan.
- c. Perform trade-off analyses that investigate the economic feasibility of using rail or water transport to minimize impacts to highways. This includes consideration of Minnesota's portion of a regional, high-speed passenger rail network (e.g., the Midwest High-Speed Rail Initiative) if funding is available and commitments from adjacent states are in place.
- d. Investigate and support, where cost-effective, the maintenance or enhancement of intermodal (rail-truck) container service in the Twin Cities and in Greater Minnesota. Potential enhancements include facility and service expansion or relocation, consistent with state and regional priorities that provide expanded market opportunities and increased competitiveness for Minnesota businesses. Other potential enhancements include seeking the National Highway System (NHS) Intermodal Connector designation for eligible highways leading to intermodal terminals.

#### **4B. Partnerships in Highway, Rail, and Water Transport**

*Mn/DOT will continue to work with multistate and national groups as well as Minnesota's congressional delegation to support national policies and projects that are critical to Minnesota's economy.*

Due to the importance of surface travel between Minnesota and other states, the maintenance or enhancement of multistate transportation corridors will continue to be important. Highway corridors, such as I-94, I-35, and I-90, and numerous state highways support important cross-border travel. Similarly, rail and waterway corridors provide key freight transport to nearby states.

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*Mn/DOT will continue to work to strengthen partnerships that can positively influence linkages to and from Minnesota.*

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While the multistate and international corridors are important connections, they also face issues. Significant transportation constraints on key corridors result in delays and added costs to Minnesota travelers, shippers, and receivers and threaten to weaken Minnesota's competitiveness. For example, intermodal container cargo routinely moves from Los Angeles to Chicago via rail, then by truck from Chicago to the Twin Cities. Congestion in Chicago regularly adds two or more days of transit time, as compared to routes that bypass Chicago, as well as extra handling and mileage costs. Minnesota lacks direct rail container access to the south and southwest. Intermodal containers being shipped by rail destined for the south and southwest must go through Chicago, adding transit time and cost, and hampering Minnesota's competitiveness in the south, southwest, and Far East markets. The Great Lakes and Upper Mississippi River locks are other examples, all are undersized for modern vessels, resulting in the use of smaller ships or barges and inefficiencies. Truck size and weight regulations are a third example. The regulations are inconsistent between states and provinces, which creates barriers to cross-border freight movement and inefficiencies as numerous exceptions to Minnesota size and weight regulations are requested each year (i.e., shipments of sugar beets, canola, and aggregate).

To address these and other multistate or international issues, Mn/DOT will do the following:

- a. Continue to participate in multistate transportation corridor coalitions to seek support for improvements on key transportation corridors that connect with or serve Minnesota. This includes the American Association of State Highway and Transportation Officials (AASHTO) Mississippi Valley Freight Coalition in the Midwest, the Northwest Passage Coalition focused on I-90 and I-94, as well as groups organized around the Great Lakes-St. Lawrence Seaway and Mississippi River.
- b. Meet periodically with Departments of Transportation from neighboring states to discuss mutual transportation issues. Examples of issues include updating major jurisdictional transportation plans, developing support for the modification and harmonization of truck size and weight laws (e.g., corridor-specific, regional permitting could provide an interim approach until higher-level legislation can be developed), and actively coordinating the development of proposals for rail-highway intermodal terminals that consolidate demand across political boundaries.

- c. Encourage a strong federal role in developing and establishing a comprehensive, integrated national freight policy.
- d. Work with representatives from other state agencies (e.g., Minnesota Department of Employment and Economic Development), neighboring states and provinces, and at the national level to establish a structure for regular, on-going, working-level dialogue regarding mutual transportation related issues.
- e. Actively engage private industry (e.g., timber, sugar beet) and freight organizations (e.g., Minnesota Freight Advisory Committee and Minnesota Shippers Association) to better understand specific freight transportation system needs, consider potential solutions (including public-private partnerships), and implement actions where appropriate.

#### 4C. Minnesota Air Transport

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*Mn/DOT supports a strong federal role in updating control technology in planes and towers.*

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*The Metropolitan Airports Commission, the Metropolitan Council, Mn/DOT and other agencies will work to strengthen Minnesota's national and global air transport system, including maintaining the Minneapolis-Saint Paul International Airport as a major passenger hub.*

Airline consolidation is an ongoing threat to high-quality service at the Minneapolis-Saint Paul International Airport. Economic conditions for air service, affected by the U.S. national debt structure, the strength of the dollar as compared to other currencies, and threats of terrorism, have been unstable and are likely to remain tenuous as energy prices remain volatile. These conditions have resulted in the recent merger of Northwest and Delta airlines, potentially threatening the strong national and international connections served at the Minneapolis-Saint Paul International Airport that have been critical in supporting Minnesota's high tech and international business. Furthermore, existing airport capacity is constrained because of dated flight control technology and the current Federal Aviation Administration air traffic control system.



*Minnesota has a strong supporting system of local airports that provide access businesses across the state. In addition, Minneapolis-Saint Paul International Airport provides extensive connections to national and international destinations.*

To address these issues, Mn/DOT will support Metropolitan Airports Commission (MAC) efforts to develop a strategy for securing quality air service long-term at the Minneapolis-Saint Paul International Airport and to discuss the use of other Minnesota airports, such as those at Rochester, St. Cloud, and Duluth to relieve congestion at MSP. Mn/DOT will also support a strong federal role in implementing updated control technology in aircraft and control towers.

#### 4D. Performance Measures

Mn/DOT will develop and monitor performance indicators useful in communicating the health of Minnesota's national and global connections. As national and global transport continues to gain importance in maintaining economic competitiveness, so does the need to monitor and report performance on the systems supporting the connections. Performance will be reported to both transportation authorities and decision makers.

#### Performance Measures and Indicators

Performance measures, indicators, and targets provide quantitative information to transportation authorities and decision makers. When this information is tracked over time, it supports the ability to monitor national and global mobility and investment levels as well as the changes in mobility given changes in investment levels. Numerous performance measures and indicators have been either developed or identified for this policy area and are listed below. A full description of all performance measures and indicators associated with this plan is provided in Appendix D.

- Number of Destinations Served by Nonstop Flights from Minnesota
- Minnesota Enplanements

#### *Developmental Measures*

- Freight Mode by Weight and Value
- Cost of Goods Movement and Transit Time in Key National Modal Corridors
- Regional and Shortline Rail with 286,000 Pound Rating
- Delays through Minnesota Locks and Dams

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<sup>1</sup> Metropolitan Airports Commission, 2007.

<sup>2</sup> *Transportation Invest In Our Future – America's Freight Challenge*, AASHTO, May 2007.

<sup>3</sup> *Minnesota Statewide Freight Plan*, Minnesota Department of Transportation, Office of Freight and Commercial Vehicles, 2005.

<sup>4</sup> *Minnesota Statewide Freight Plan*, Minnesota Department of Transportation, Office of Freight and Commercial Vehicles, 2005.

<sup>5</sup> Mn/DOT Office of Freight and Commercial Vehicles, December 2007.

<sup>6</sup> The state's two major intermodal container facilities (Burlington-Northern Santa Fe and Canadian Pacific), which presently handle more than 98 percent of freight containers in Minnesota, are located in densely developed urban areas within the Twin Cities with limited opportunity to expand.

<sup>7</sup> The MRSI program provides financial support to address rail infrastructure deficiencies, such as bridge replacements or shipper's facilities, where critical to national and global connections.

<sup>8</sup> The Port Development Assistance seeks to address a portion of the infrastructure needs of Minnesota's public port authorities.



## Policy 5: Statewide Connections



### Summary

**Enhance the movement of people and freight between regional trade centers (RTC) within Minnesota by providing efficient, multimodal transportation connections.** Travel between regional trade centers is important for citizens and businesses throughout the state. Strong transportation connections link workers with jobs, raw materials with manufacturers, and recreational users with parks and natural resource areas. In 2000, Mn/DOT created the Interregional Corridor (IRC) System with the goal of enhancing the economic vitality of the state by providing safe, timely, and efficient highway connections between key economic centers throughout the state. Mn/DOT will continue to work with its partners to maintain safety and mobility on these interregional corridors and will identify strategic, cost-effective modal options for statewide travel such as intercity bus service, high-speed passenger rail, regional freight rail, and air service for both passengers and freight.

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*Travel between regional trade centers is important for citizens and businesses throughout the state.*

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- 5A. The IRC System:** Mn/DOT will work with transportation partners to maintain and enhance mobility on the IRC System.
- 5B. Supplemental Truck Routes:** Mn/DOT will work with local transportation stakeholders and freight industries to define a supplementary freight system in Greater Minnesota.
- 5C. Regional Corridors:** Mn/DOT will work with transportation partners to maintain mobility on Minnesota's Regional Corridors.
- 5D. Intercity Bus Services:** Mn/DOT will work with intercity bus providers and communities to maximize coverage for cost-effective intercity bus services.
- 5E. Intercity Passenger Rail Services:** Mn/DOT will evaluate issues, opportunities, and constraints for intercity passenger rail services and define state roles and responsibilities as part of the future state rail plan.
- 5F. Greater Minnesota Air Service:** Mn/DOT will work with local communities and airport officials to maintain and/or enhance scheduled air service, as well as to maintain and/or enhance local aviation facilities.

### Background and Context

Where Policy 4: National and Global Connections focuses on Minnesota's connections to the world, Policy 5: Statewide Connections focuses on connections between regional trade centers (RTCs) within the state. The RTC concept was established in the early 1960s by University of Minnesota professors as a way to describe and rank communities based on levels of activity and business.<sup>1</sup> The eight-level hierarchy of RTCs ranges from metropolitan areas, which have the highest level of economic activity, to hamlets having the lowest levels.

Because all trade centers do not support the same level of economic activity, transportation between centers is essential to obtain needed goods and services. Statewide transportation connects people with jobs and services; distributors with manufacturers, producers, and exporters; shoppers with retailers; and tourists with recreational opportunities. These connections support the majority of economic activity in the state.

The following modes presently provide transportation connections for large numbers of people and large volumes of freight between RTCs:

### **Highways – IRCs and Regional Corridors**

In 2000, Mn/DOT designated a primary set of highways for moving goods and people between RTCs. This set, called the IRC system, is comprised of 2,939 miles of highways. It represents only two percent of all roadway miles in the state, but it carries approximately 27 percent of all vehicle miles traveled and the majority of freight traffic. The intent of the IRC System is to support a high level of mobility for longer trips and travel between trade centers. Figure 7.5.1 shows that IRCs include I-94, I-35, US 2, US 10, US 52, US 169 and MN 23.

Mn/DOT also designated a set of highways called Regional Corridors that complement the IRC System. Regional Corridors play significant roles by connecting smaller trade centers with larger ones or with IRCs. The system consists of approximately 2,600 miles of principal and minor arterial highways. Many Regional Corridor routes serve as the primary transportation linkage into and out of entire regions, especially in Greater Minnesota, providing critical support to the region's ability to move people and freight in a cost-effective way.

### **Other Modes**

Air and buses are the primary modes that move people between trade centers other than highways, with growing interest in passenger rail. Air services provide quick connections through both scheduled and unscheduled flights. Most of the scheduled flights connect to the Minneapolis-St. Paul International Airport (MSP) where passengers can transfer flights to other destinations. Intercity bus services are provided by Greyhound and Jefferson Lines. These private, for-profit carriers provide service to approximately 65 cities in Minnesota. These services, and the growing interest in passenger rail, are important travel options for an aging population.

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*Air and transit are the primary modes that move people between trade centers other than highways.*

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The share of freight presently moved by rail, water, and air between Minnesota RTCs is currently very small because market conditions have made these services cost-effective over longer distances. With few exceptions, most of this local non-highway freight is moved by rail. There are 19 regional and short-line railroads that presently move materials over shorter distances; they function as tributaries, funneling freight to the larger Class 1 railroads and national or international origins/destinations. For this reason, policy issues regarding railroads hauling freight are dealt with in Policy 4: National and Global Connections.



## Strategies

Maintaining safe and efficient connections between RTCs will continue to be one of Mn/DOT's most important goals. To achieve this goal, the following strategies have been identified:

### 5A. The IRC System

*Mn/DOT will work with transportation partners to maintain and enhance mobility on the IRC System.*

The state highway system is a critical network that supports both urban and rural centers throughout Minnesota. This system moves goods to markets and puts products on store shelves. In fact, truck movements on Minnesota highways recently accounted for 59 percent of all freight moved by weight and 79 percent moved by value. A third of this truck traffic is intrastate, moving between Minnesota locations. The importance of truck movements is expected to increase as the weight of freight moved by truck in Minnesota is projected to grow from 59 to 66 percent by 2020.<sup>2</sup>



*Mn/DOT has made a number of improvements to the IRC System, including TH 212 through Chaska.*

The IRC System is the backbone of the Minnesota's highway system. It provides high-level connections between regions and major trade centers throughout the state. Traffic volumes on IRCs have risen by 50 percent in the last 10 years causing congestion and safety concerns especially near large RTCs. As such, Mn/DOT and its local transportation partners have made significant investments in many corridors including improvements to TH 212, TH 52, TH 169, and TH 101. However, mobility challenges continue to exist, especially on corridors approaching the Twin Cities Metropolitan Area (TCMA) and on key corridors in central Minnesota. Maintaining and/or improving mobility on these and other IRCs is important to the state. Mn/DOT will work with local transportation partners to:

- a. Evaluate performance on IRCs and develop IRC improvements using context appropriate solutions; re-examine current corridor visions, and where appropriate and feasible, consider cost-effective solutions such as super-twos, High Occupancy Vehicle and Toll (HOV/HOT) lanes and/or dynamic shoulders to improve safety and mobility.

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*Increased instrumentation of IRCs entering the TCMA will provide improved corridor management and user communication.*

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- b. Review and plan appropriate access modifications in urbanizing areas to address growth and safety needs.
- c. Guide future growth and planning where long-term corridor visions have been developed (improvements that go beyond performance targets). Improvements associated with these visions will be considered as priorities beyond the 2028 planning horizon.
- d. Coordinate IRC management strategies to ensure consistency between Mn/DOT districts, including the development of the future mobility vision for the TCMA.
- e. Evaluate radial IRCs entering the TCMA to identify multimodal and Intelligent Transportation Systems (ITS) improvements with potential to enhance transit, carpool use, and real-time traveler information, maximize mobility and person throughput, and improve safety over the long-term. For example, an increased level of instrumentation on the corridors would provide for the ability to manage and respond to incidents more quickly and for improved communication with users. Mn/DOT will work with the Metropolitan Council, affected counties in the TCMA, and the counties surrounding the TCMA to reexamine and update the management strategies for radial IRCs.
- f. Assess truck parking supply and demand along IRC radial routes approaching the TCMA and identify potential strategies to reduce peak hour truck usage; provide real-time parking strategies for potential freight users in IRC corridors.
- g. Enhance existing, isolated, signalized intersections to provide “truck priority” for mainline movements, thereby improving safety, and minimizing delays and user costs.<sup>3</sup>
- h. Review and evaluate turn lane length on high-speed expressways (65 mph), high-speed two lane facilities (60 mph), and freeway ramp lengths to ensure safe operations. Mn/DOT will also review its policy for cross-street approach signing for interchanges to provide better advanced notice of interchange configuration.

## **5B. Supplemental Truck Routes**

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*To supplement the IRC System, Mn/DOT will work with its partners to identify candidates for truck routes.*

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*Mn/DOT will work with local transportation stakeholders and freight industries to define a supplementary freight system in Greater Minnesota.*

The IRC System provides the main connections between RTCs and carries the majority of truck volumes; however, there are a number of areas within the state where IRC coverage is limited. In these areas, there is concern about inadequate support for the movement of freight on highways. The identification and designation of supplemental truck routes and development of corresponding performance measures could enhance the safety and reliability of freight movements. Mn/DOT will work with its transportation partners to identify candidates for truck routes to supplement the IRC System and develop performance measures.

### **5C. Regional Corridors**

*Mn/DOT will work with its transportation partners to maintain mobility on Regional Corridors.*

Regional Corridors complement the IRC System and provide connectivity between RTCs and other transportation systems. Mn/DOT will continue to evaluate performance on the Regional Corridor system and work with its partners to prioritize needed improvements.

### **5D. Intercity Bus Services**

*Mn/DOT will work with intercity bus providers and communities to maximize coverage for cost-effective intercity bus services.*

Limited service between trade centers is currently provided by Greyhound and Jefferson Lines. More recent trends suggest that bus service is in greater demand as fuel costs have increased and as the population has aged. The issues and demands for intercity transit services and the state's role and responsibility for enhancing this service will be further defined with the Intercity Bus Study that is currently being done by Mn/DOT. This study will be completed in 2009. Among other things, the study will explore opportunities for enhanced coordination with other local transit providers in an effort to create a more seamless transit system. In addition, this study will look at developing a system performance measurement for this service area.

### **5E. Intercity Passenger Rail Services**

*Mn/DOT will evaluate issues, opportunities, and constraints for intercity passenger rail services and define state roles and responsibilities as part of the future state rail plan.*

Increasing fuel costs, highway congestion, and security issues at major airports are driving increased public interest in passenger rail services. Currently, Amtrak service is available through Minnesota, but service is limited. Potential benefits and costs of passenger rail need to be assessed, including potential service conflicts on existing high-volume, freight rail lines where passenger rail may be proposed. These issues will be addressed in the Statewide Freight and Passenger Rail Plan as referenced in Policy 4: National and Global Connections and further described in Chapter 8: Future Plans and Studies.

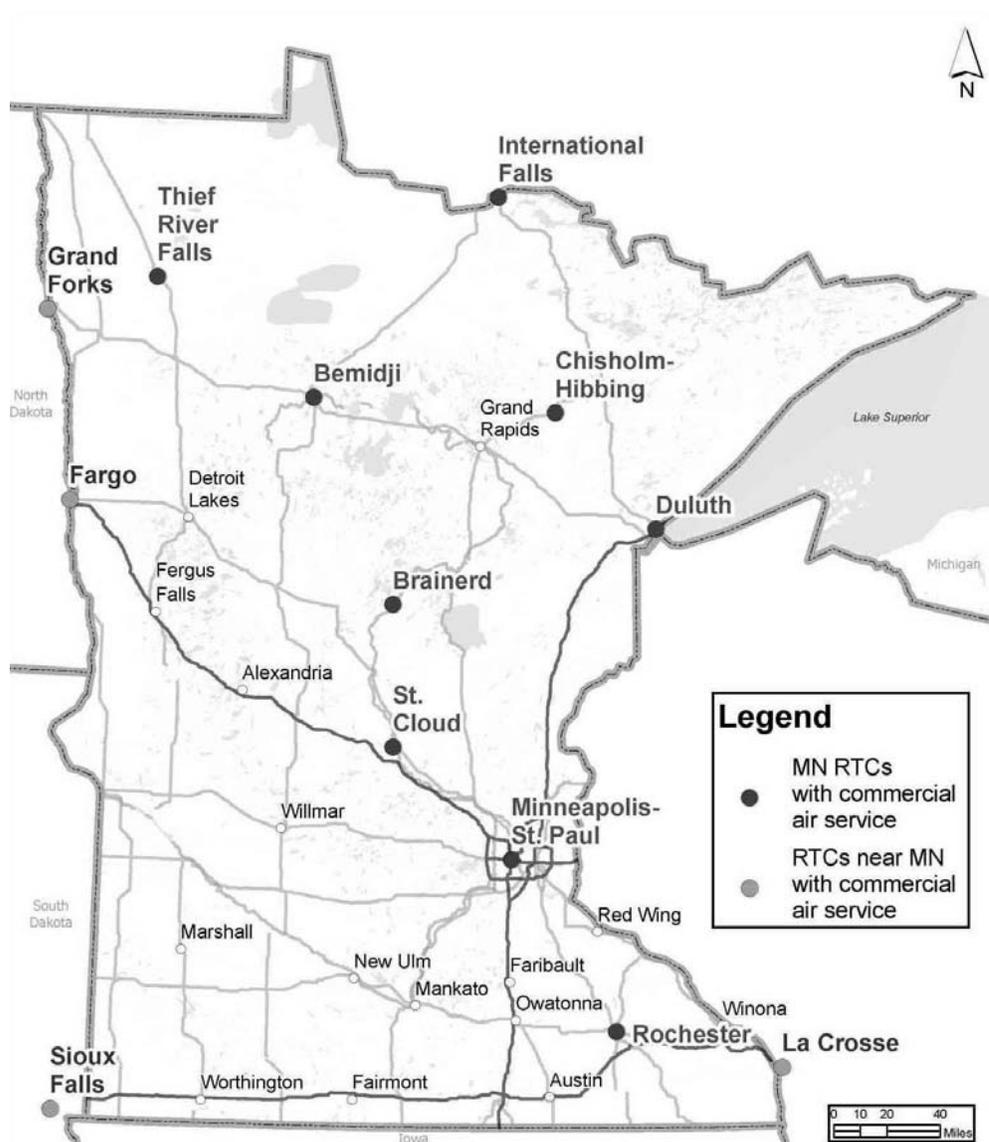
### **5F. Greater Minnesota Air Service**

*Mn/DOT will work with local communities and airport officials to maintain and/or enhance scheduled air service as well as maintain and/or enhance local aviation facilities.*

Scheduled commercial air service presently exists in the nine RTCs shown in Figure 7.5.2. – Thief River Falls, Bemidji, Brainerd, International Falls, Chisholm-Hibbing, Duluth, St. Cloud, Rochester and Minneapolis-St. Paul. Commercial airports located just beyond Minnesota's borders in Fargo and Grand Forks, North Dakota; Sioux Falls, South Dakota; Mason City, Iowa; and La Crosse, Wisconsin, also serve Minnesota residents and businesses in their respective geographic areas.

Scheduled air services from these airports provide an important role in connecting Greater Minnesota cities and regions to the Minneapolis-Saint Paul International Airport. Maintaining scheduled flights to these communities is an ongoing challenge given increasing operating costs. While these services are important to local communities, Mn/DOT has little control over the large market forces and economics that drive service decisions.

In addition to these airports, Minnesota has 95 paved and lighted airports that are used for unscheduled flights. Many of these airports are used by private businesses. For example, Marvin Windows in Warroad uses the Warroad airport to shuttle staff from its headquarters and manufacturing center to other offices and plants around the country and to bring in prospective customers. These airports are critical to maintaining and growing many businesses in rural areas of the state.



**Figure 7.5.2 Regional Trade Centers with Commercial Air Service**

Source: Mn/DOT Office of Aeronautics

## **Performance Measures and Indicators**

Performance measures and/or indicators provide quantitative information to managers and/or decision makers. This information will be tracked over time to monitor yearly performance levels. Numerous performance measures and indicators have been either developed or identified for this policy area. A number of these measures and/or indicators are selected for representation and discussion within this policy and are **bolded** below. A full description of all performance measures and indicators associated with this plan is provided in Appendix D.

- **Travel Speed on Greater Minnesota Interregional Corridors (IRC)**
- Access to Intercity Bus Service
- **Access to Scheduled Air Service**
- Access to Airports with a Paved and Lighted Runway
- Airports with Reported Cargo Service

### *Developmental Measures*

- Access to Intercity Rail Service

### Travel Speed on Greater Minnesota IRCs

This measure was developed in 2000 as part of the Interregional Corridor Study and was refined in 2008 to address overlapping mobility performance measures within the Twin Cities Metropolitan Area (IRC's within the metro area will now be tracked as part of the metro network, using metro mobility measures). The IRC measure tracks changes in estimated travel speeds on IRC corridors. Speed estimates are based on posted speed limits, and also take into account delays caused by signals, stop signs, and congestion. Currently, 98 percent of the Greater Minnesota IRC System performs near or above identified speed targets as illustrated in Figure 7.5.3. Figure 7.5.4 shows that IRC performance is expected to decline by 2028, to 91 percent performing, as traffic volumes increase and taking into account projects in the 2009-2012 STIP but none thereafter. The expectation is that all Greater Minnesota IRCs perform near or above speed performance targets.

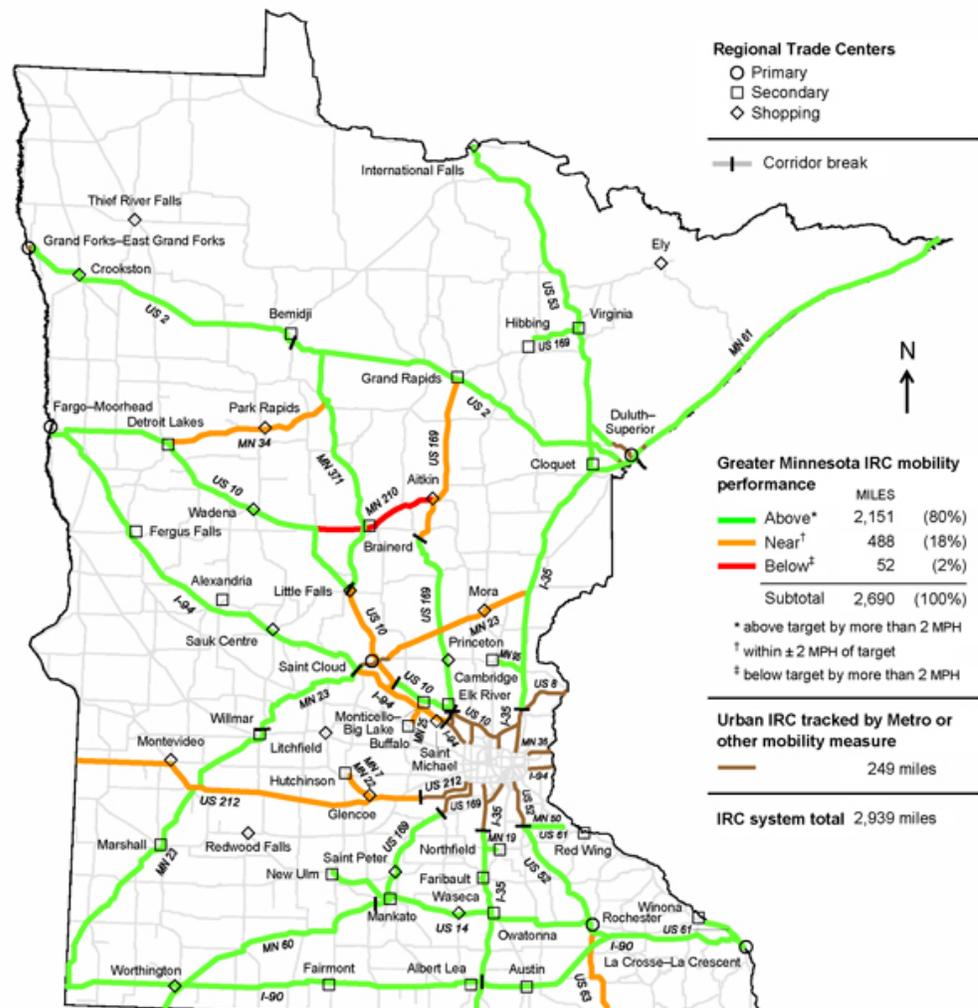


Figure 7.5.3 IRC Performance in 2008

Source: Mn/DOT Office of Investment Management

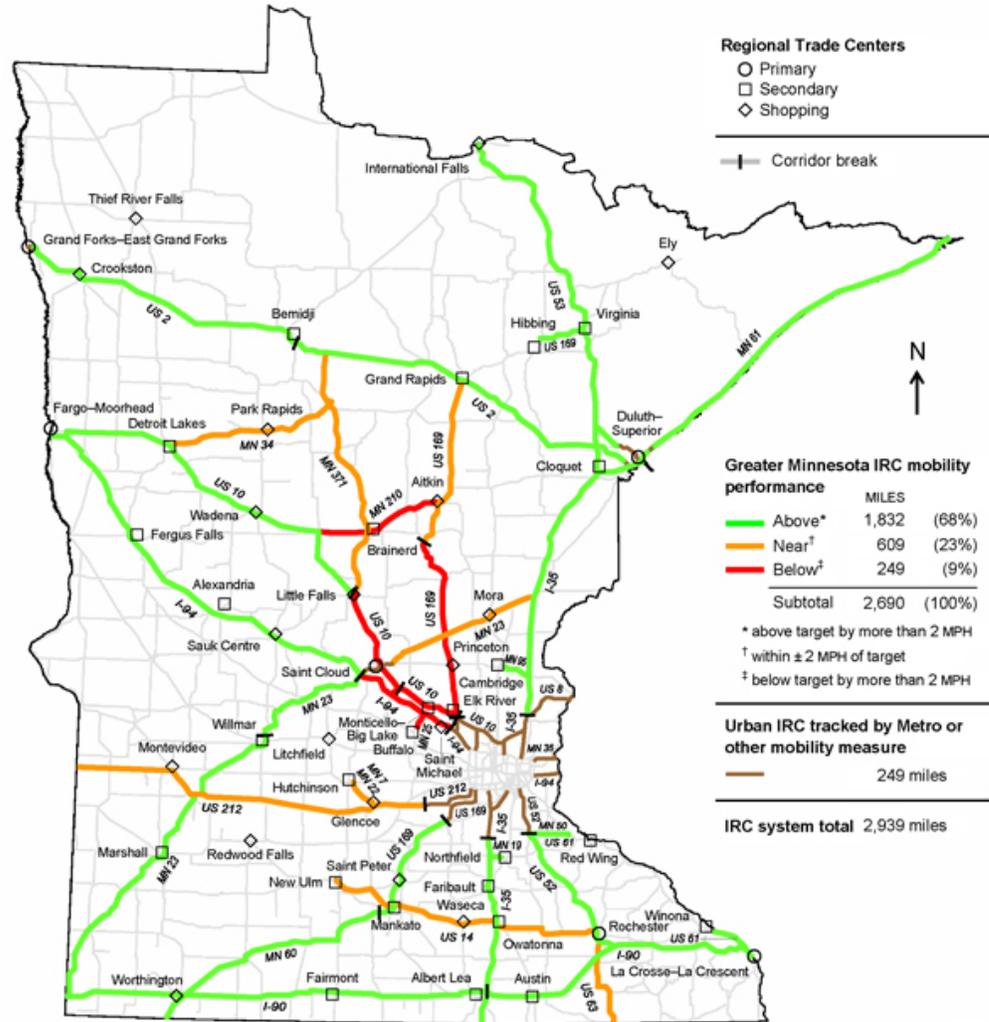
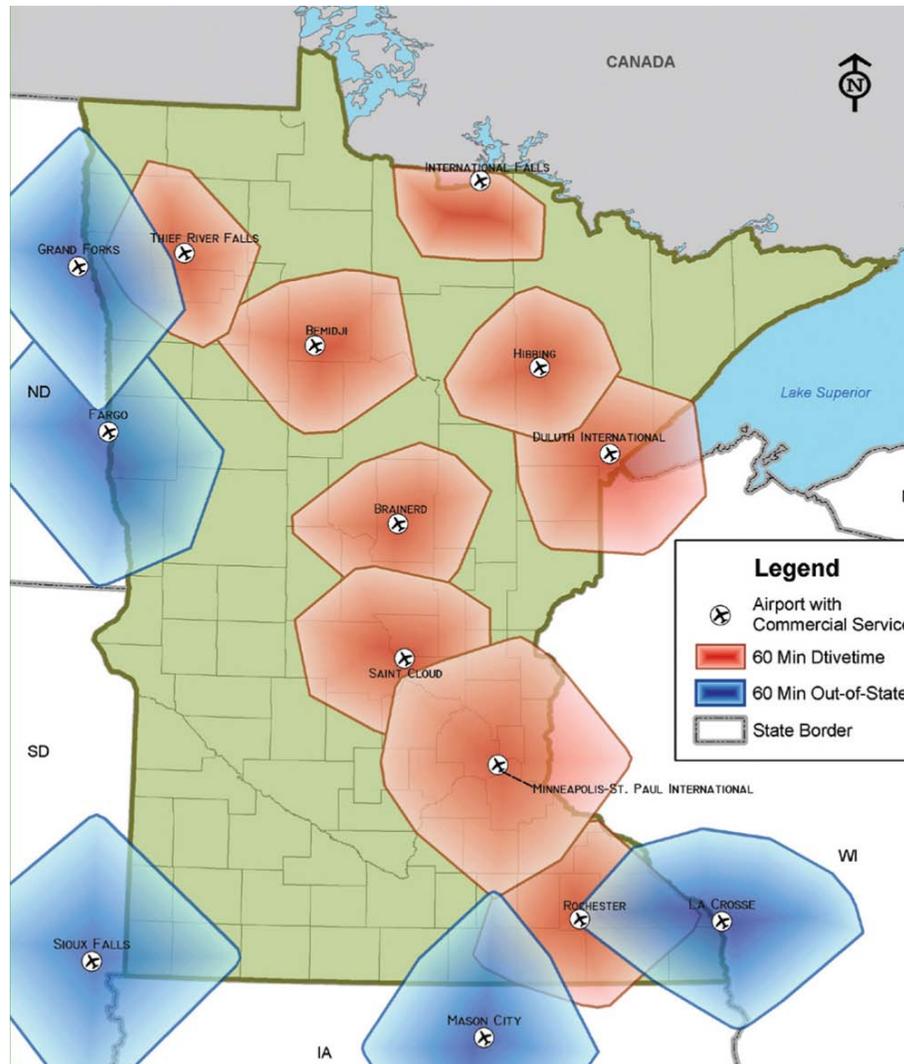


Figure 7.5.4 Forecast IRC Performance in 2028

Source: Mn/DOT Office of Investment Management

### Access to Scheduled Air Service

Nine Minnesota airports including Bemidji (BJI), Brainerd (BRD), Duluth (DLH); Hibbing (HIB); International Falls (INL); Minneapolis - Saint Paul (MSP); Rochester (RST), St. Cloud (STC), and Thief River Falls (TVF) have scheduled airline service. Airports in neighboring states such as Grand Forks and Fargo, North Dakota; Sioux Falls, South Dakota; Mason City, Iowa; and La Crosse, Wisconsin, will help to meet Minnesota’s commercial air service travel needs. Figure 7.5.5 shows these 14 commercial airports are within a one hour travel time for 86 percent of Minnesota’s population. The target performance level is to have 90 percent of the population within 60 minutes of a commercial service airport.



**Figure 7.5.5 Areas within 60 Minutes of Airports with Scheduled Airline Service**

Source: Mn/DOT Office of Aeronautics

Mn/DOT and Minnesota communities and airports have limited influence on how and where commercial air service is provided. Therefore, there are no recommendations for improving performance for this measure. It does not appear that any additional airports in Minnesota will secure scheduled commercial air service in the near term. However, as the percentage of population increases in urban areas, it is expected that performance levels will increase over time.

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<sup>1</sup> John R. Borchert and Russell B. Adams, *Trade Centers and Trade Areas of the Upper Midwest: Upper Midwest Economic Study*, Urban Report No. 3 CURA, University of Minnesota, 1963.

<sup>2</sup> *Minnesota Statewide Freight Plan*, Minnesota Department of Transportation, Office of Freight and Commercial Vehicles, 2005.

<sup>3</sup> S.R. Sunkari, H.A. Charara, and T. Urbanik, *Reducing Truck Stops at High-Speed Isolated Traffic Signals*, Texas Transportation Institute Report 1439-8, 2000.

## Policy 6: Twin Cities Mobility




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*This plan emphasizes lower cost, system-wide improvements that optimize use of existing highway capacity and right-of-way and provides advantages for transit.*

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### Summary

**Provide mobility and address congestion in the Twin Cities by optimizing use of the existing system and making strategic capacity investments in both highways and transit.** This plan moves the region away from its long-held and historical approach of attempting to build its way out of congestion by adding more highway lanes – one major project at a time – to a more innovative, balanced, and financially realistic effort to address regional mobility needs. This approach reflects an understanding that congestion may be mitigated but not eliminated. It also emphasizes lower cost, system-wide improvements that optimize use of existing highway capacity and right-of-way and provides advantages for transit. Examples include improvements in lane continuity, use of shoulders during peak hours, incident clearance, and signal timing. Managing demand through metering, traveler information, and potential expansion of pricing is also envisioned. Improvements to expand capacity and/or access will be part of the approach, but these investments will be focused on strategic improvements to both the highway and transit systems. This approach for mobility in the Twin Cities will be fully articulated through a joint study led by Mn/DOT and the Metropolitan Council beginning in early 2009. The findings will be incorporated into the Metropolitan Council’s Transportation Policy Plan in 2010 through a formal amendment.

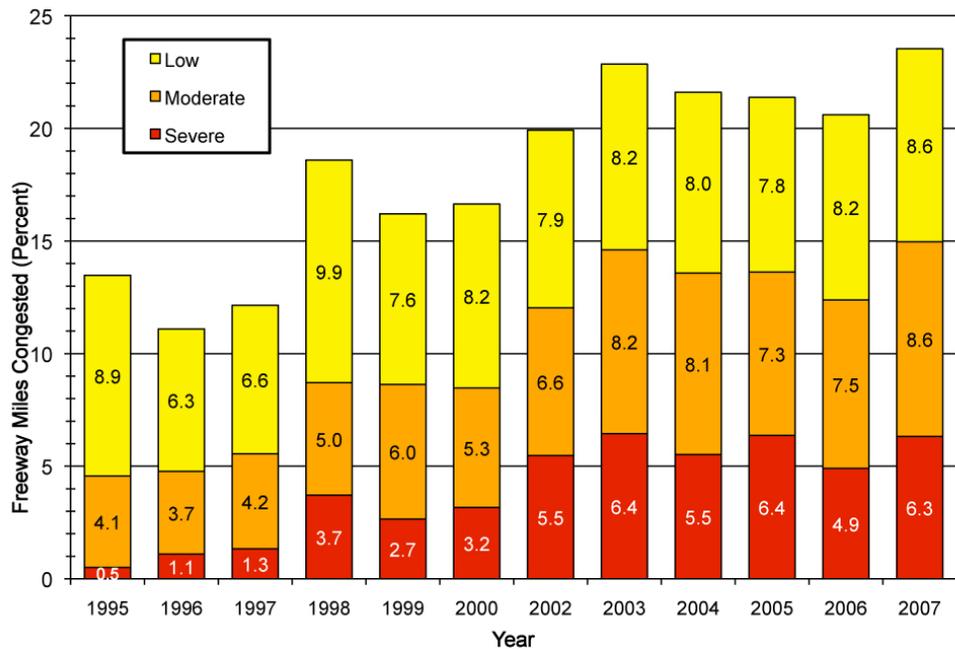
- 6A. Approach to Twin Cities Mobility:** The Metropolitan Council and Mn/DOT will jointly pursue with other regional partners an approach to mobility in the Twin Cities that leverages existing resources for all available transportation modes in order to optimize mobility.
- 6B. Innovative Solutions:** Mn/DOT will take an innovative approach to optimizing performance of the existing system including the use of existing lanes, shoulders and right-of-way.
- 6C. Strategic Capacity Improvements:** Mn/DOT will work with the Metropolitan Council and other partners to identify strategic highway capacity and access improvements that will support the economy and planned growth of the region.
- 6D. Metro Transit Plan:** The Metropolitan Council with support from regional partners will implement the Metropolitan Council’s 2030 Transit Master Study. Mn/DOT will support these efforts where appropriate.
- 6E. Freight Movements:** Mn/DOT will work with its transportation partners to investigate barriers to freight movements and their potential solutions.
- 6F. Bicycle and Pedestrian Systems:** The Metropolitan Council, state, and local units of government will support efforts to increase the share of trips made by bicycling and walking in the Twin Cities and develop and maintain efficient, safe and appealing pedestrian and bicycle transportation systems.

*Growth coupled with limited financial resources suggests that travel demand will continue to outpace transportation capacity.*

## Background and Context

The Twin Cities Metropolitan Area (TCMA) is the economic engine for much of the Upper Midwest. As the nation’s 16th largest metropolitan area, it provides a multitude of services and shopping opportunities, and it is home to many educational institutions, Fortune 500 companies, and recreational venues that attract visitors and business from all over the world.

With a population of more than 2.8 million people, more than half of Minnesota’s population resides in the TCMA. Estimates are that nearly one million more people will be added to the area by the year 2030. This growth coupled with limited financial resources suggests that travel demand will continue to outpace the regions financial ability to increase its transportation capacity. This is due to a number of factors including the need to commit significant resources to replace and repair aging infrastructure, rising construction costs due to global demands for construction materials, and the fact that unrestricted user demands typically – and quickly – fill available capacity, as illustrated by the growing congestion shown in Figure 7.6.1.



**Figure 7.6.1 Twin Cities Freeway Congestion from 1996 to 2007**

Source: Mn/DOT Regional Traffic Management Center

The Metropolitan Council 2030 Transportation Policy Plan states that the metropolitan region faces difficult choices in addressing safety, mobility, and preservation needs. It focuses on preserving the existing system, investing in lower cost/high benefit projects that mitigate congestion problems, optimizing the use of all available transportation modes, and identifying a limited number of strategic projects that provide expanded transportation system capacity for the region.

Given the staggering needs and limited resources, an approach is needed to address mobility issues in the Twin Cities Metropolitan Area. For example, how can the metropolitan area’s transportation authorities move more people for less cost? How

can the metropolitan area's transportation authorities better utilize the current space and right-of-way available to improve safety and traffic flow? How can transit and highway investments be better integrated to achieve greater efficiencies and movement of people? Where are the major congestion problems and system gaps that require strategic investments? What demand management strategies should be considered to maintain traffic flows so that the system operates as efficiently as possible?

This approach will focus on innovative ways to optimize the use of current lanes, shoulders and right-of-way. While this might include a limited number of strategic projects aimed at adding additional highway capacity through traditional methods, it will also include lower cost, non-traditional high benefit projects intended to quickly spread benefits to more users. Mn/DOT has begun testing some of these low-cost strategies through pilot projects such as the addition of lanes using only existing pavement on Highway 100 in St. Louis Park, and the implementation of innovative pricing and transit strategies as exhibited by MnPASS and the I-35W Urban Partnership Agreement (UPA) corridor.

## Strategies

The primary objective of this policy area is to provide congestion relief to the greatest extent possible through optimization of the current system and through strategic investments in both highways and transit. The following strategies have been identified to achieve this objective.

### 6A. Approach for Twin Cities Mobility

*The Metropolitan Council and Mn/DOT will jointly pursue with other regional partners an approach to mobility in the Twin Cities that leverages existing resources for all available transportation modes in order to optimize mobility.*

Today, despite the fact that the TCMA has built more miles of highway per capita than most regions of the country,<sup>1</sup> congestion continues to grow. The Metropolitan Council completed a study in 2007 indicating that it would take more than \$40 billion (in 2004 dollars) to fix highway congestion in the Twin Cities by 2030.<sup>2</sup> To implement that level of expansion, more than \$2 per gallon in additional fuel tax would be required.

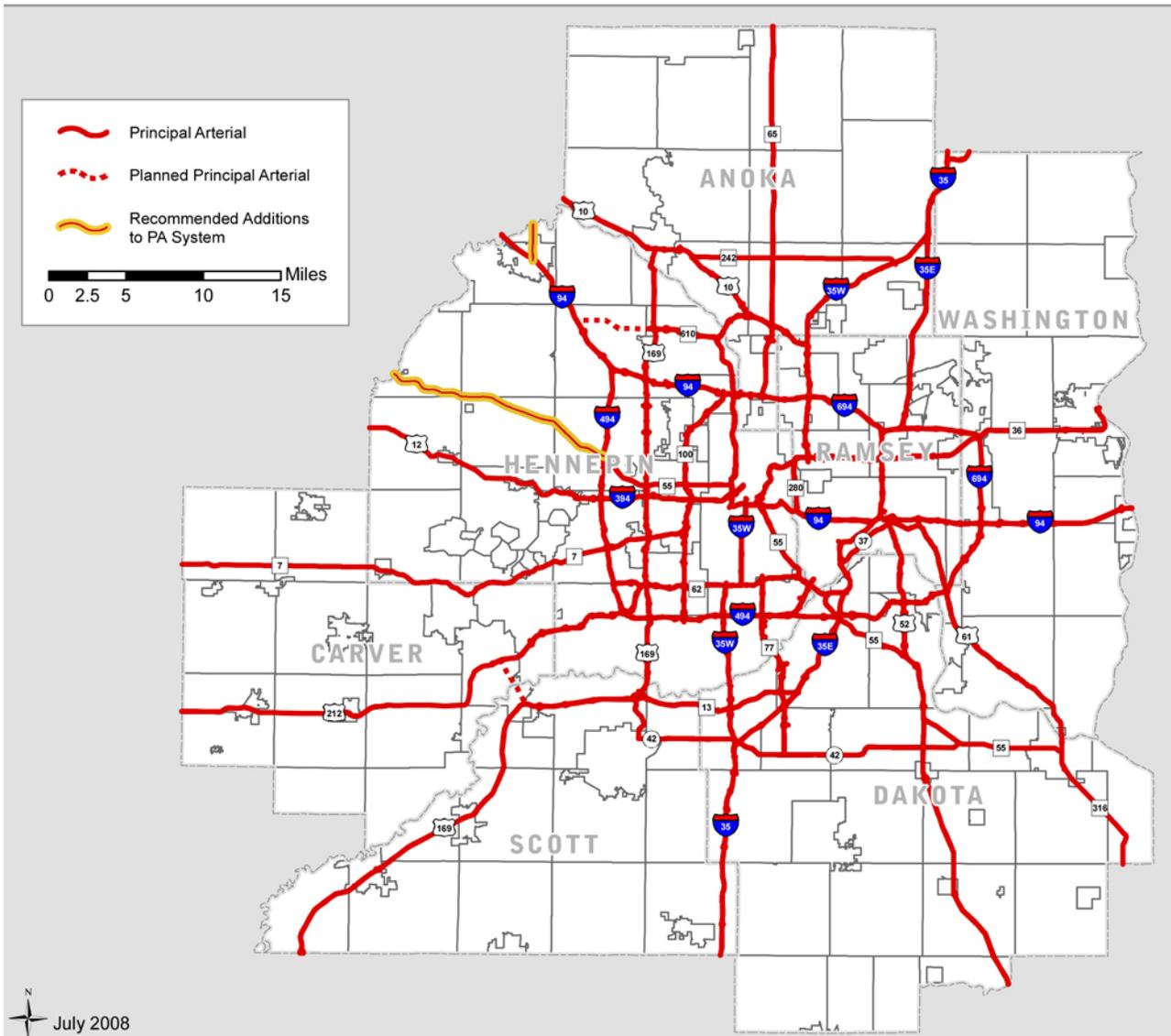
Mn/DOT and the Metropolitan Council have concluded that expanding regional highway capacity alone is not a realistic solution to congestion. Both organizations also know some strategic expansion of the system is needed at all jurisdictional levels to address future growth of the region and problem areas in the system today. Improvements may include filling system gaps, improving major river crossings, developing interchanges, and other basic expansions to address growth issues. However, the planning and implementation for these projects should not be undertaken as if the entire system would one-day be congestion free; rather, they should be undertaken with an ultimate goal of a better managed and more efficient system. Furthermore, planning and implementing projects should optimize the use of existing system capacity and right-of-way, and include a greater emphasis on travel alternatives and travel demand management.

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*Mn/DOT and the Metropolitan Council have concluded that expanding regional highway capacity alone is not a realistic solution to congestion.*

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Mn/DOT will work with the Metropolitan Council and other transportation partners to evaluate the metropolitan highway system in 2009. A primary objective of this evaluation is to determine how and where to optimize use of the system shown in Figure 7.6.2 given the current space and right-of-way constraints. This planning effort will consider more innovative strategies such as dynamic shoulders, High-Occupancy Toll (HOT) lanes, and greater integration of transit advantages to improve person throughput on key corridors. It will also consider the results from Mn/DOT's reexamination of previously planned projects (things that could be accomplished at a reduced cost) as potential areas for strategic investments. The results of this analysis would be an inventory of needed investments such as the number of lanes, regional access points, and major transit facilities.



**Figure 7.6.2 TCMA Arterials**

Source: Metropolitan Council

## 6B. Innovative Solutions

*Mn/DOT will take an innovative approach to optimizing performance of the existing system including the use of existing lanes, shoulders and right-of-way.*

Mn/DOT has been at the forefront of innovative transportation system management for many years. Mn/DOT's Regional Transportation Management Center (RTMC) is a state-of-the-art traffic operations center where state patrol dispatch, Mn/DOT maintenance dispatch, and Mn/DOT traffic operations dispatch work together to provide motorists with a faster and safer trip on metropolitan area freeways. Mn/DOT RTMC staff work closely with the Freeway Incident Response Safety Teams (FIRST) to quickly respond to and assist in the removal of highway incidents in order to reduce incident-related delay and secondary crashes.

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*Mn/DOT will place an increased emphasis on a new set of management strategies that focus on making better use of roadway surfaces and right-of-way.*

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Mn/DOT will place an increased emphasis on a new set of management strategies that focus on making better use of roadway surfaces and right-of-way. Mn/DOT has undertaken a number of lower cost pilot projects aimed at optimizing the use of the system and improving overall safety. Efforts to date include Highway 100 near Highway 7 in St. Louis Park, I-394 near Louisiana Avenue in Golden Valley, and I-94 near McKnight Road in St. Paul. The initial results of these projects have demonstrated significant congestion reduction as well as improved safety for a fraction of the full-build cost. Mn/DOT will continue to pursue these lower-cost, high-benefit projects.

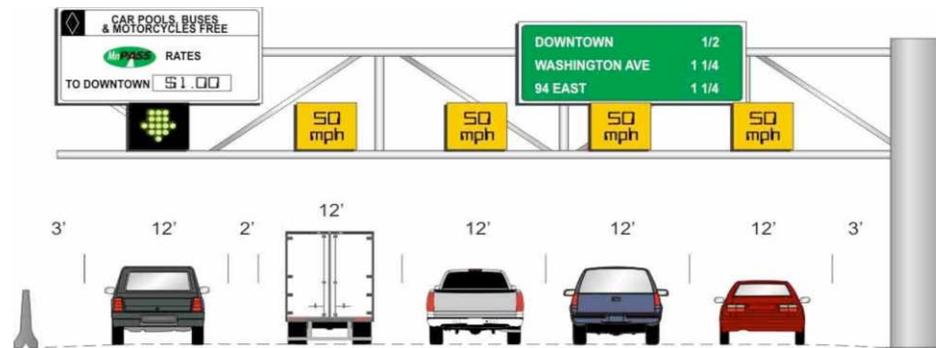
Mn/DOT will also continue to explore innovations like its first automated HOT lane. The first HOT lane project was constructed in 2005 on I-394 and maintains advantages for transit and carpoolers, while offering the ability for single occupant vehicles to purchase access for a free-flow trip. MnPASS has won numerous national and international awards and facets of it are being used to develop a new multimodal corridor on I-35W as part of the UPA.<sup>3</sup>



*I-394 MnPass opened in 2005 and is the state's first HOT lane.*

As part of its innovative approach to congestion, Mn/DOT will examine and implement a broad range of strategies to gain efficiencies and maximize person throughput. These include:

- a. Pursue lower-cost, high-benefit projects where they can effectively address congested locations, maintain and/or improve safety, and be implemented more quickly than full-scale projects. These projects may include dynamic shoulders, auxiliary lanes and/or other geometric improvements that require limited reconstruction and/or right-of-way. They also include expanded use of advanced signal technology and increased frequency of signal retiming to improve efficiency of key arterial corridors.
- b. Work with regional transportation partners to pursue advantages for transit including highly-coordinated, multimodal projects (similar to UPA), where transit riders and/or carpoolers can be effectively served using transit, High Occupancy Vehicle (HOV) or HOT facilities, and/or priced dynamic shoulders as illustrated in Figure 7.6.3. This will include working with the Metropolitan Council and other transit providers to better integrate highway and transit systems and their linkages to land use.



**Figure 7.6.3 UPA Planned Improvements along I-35W**

Source: Mn/DOT Metro District

- c. Work to further refine its operational standards and procedures for managing traffic flow including response to incidents and other events. This will include work with emergency services, enforcement, and tow operators to reduce incident clearance times and provide quick responses to stalls and/or other lane blocking events.
- d. Expand its freeway monitoring and management systems including metering systems to match congested freeway locations on key radial corridors beyond the beltway. This will also include enhanced real time traveler information. These systems will improve incident response times and better manage travel demands during peak periods on these key corridors.
- e. Work with regional transportation partners to develop a person throughput measure as one of the multimodal performance measures for the system. As this measure is developed, thought should be given to the quality and quantity of person throughput across modes.



*Advances in computers and web technologies have increased opportunities for telework.*

eWorkPlace

- f. Promote a broad range of Transportation Demand Management (TDM) initiatives that help lessen congestion in the region. This includes such things as parking pricing, carpooling, vanpooling, transit, bicycling, and walking as well as flexible work arrangements to travel during off-peak times. Mn/DOT will continue to work with local units of government and transportation management organizations (TMOs) to encourage and recruit employees, building owners and businesses to consider implementing TDM strategies. For example, Mn/DOT, with assistance from its transportation partners, is embarking on an intensive telework project called eWorkPlace as part of the UPA project for I-35W. The intent of this project is to reduce peak-period travel demand in the corridor as well as throughout the region. The successful aspects of this project should be expanded region wide to other applicable corridors. These strategies should incorporate ways to use new technologies and innovation to improve communications with users to proactively manage weather-related events, expand user access to real-time traffic information, and improve trip planning through web technologies.

### **6C. Strategic Capacity Improvements**

*Mn/DOT will work with the Metropolitan Council and other partners to identify strategic highway capacity and access improvements that will support the economy and planned growth of the region.*

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*With the need to accommodate nearly one million more people in the region by 2030, more traditional capacity expansions will be needed at strategic locations.*

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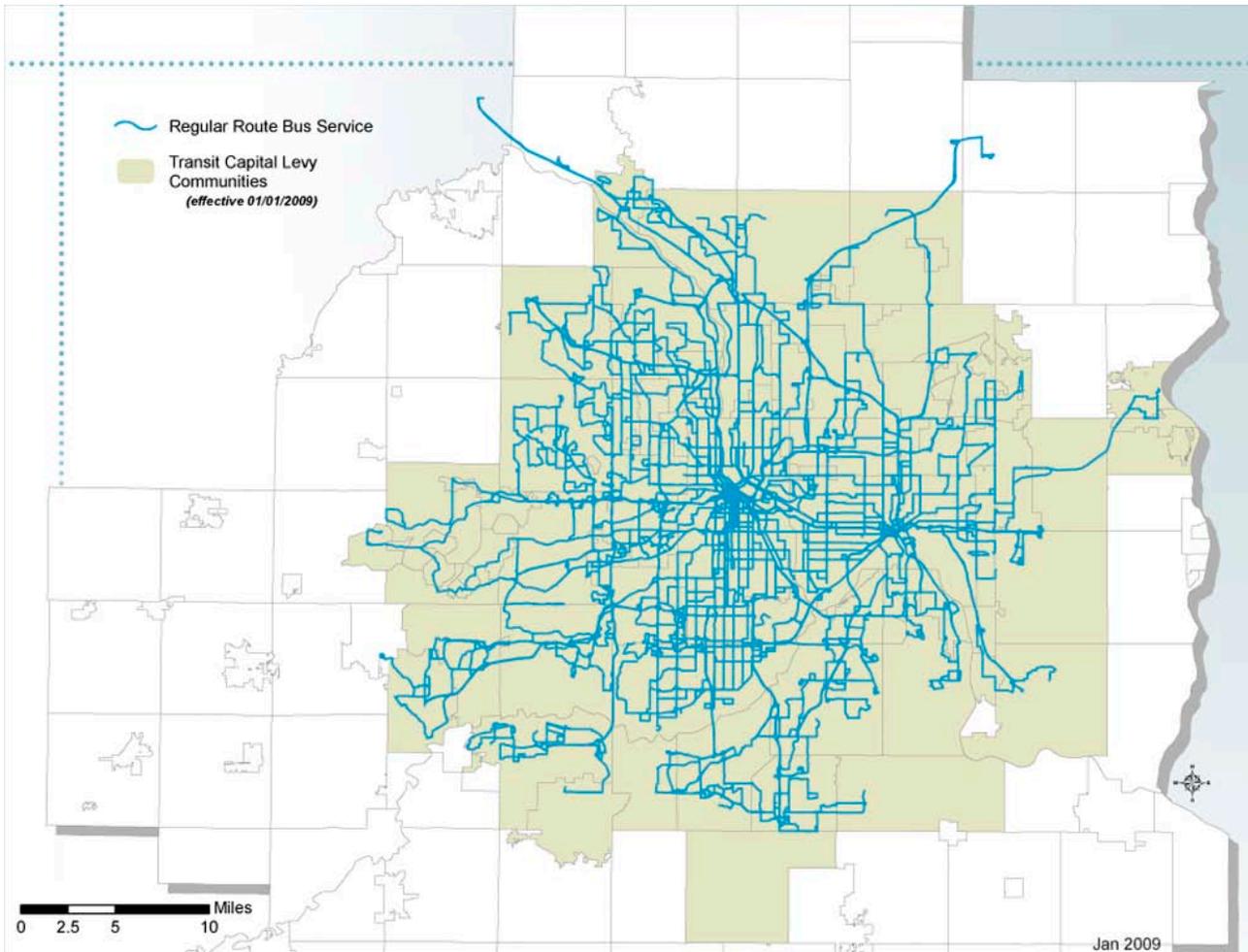
With the need to accommodate nearly one million more people in the region by 2030, more traditional capacity expansions will be needed at strategic locations. These strategic investments will focus on filling gaps in the system, providing full-scale expansion where more innovative methods may not be feasible and/or providing access improvements to support planned growth. These investments should be located and designed so that they do not simply move congestion to other points on the system. They should also be designed to provide appropriate transit advantages as well as travel demand management elements to maintain person throughput and manage overall traffic flow. The strategic investments should be coordinated with other system-wide investments to ensure consistency and optimization across modes.

### **6D. Metro Transit Plan**

*The Metropolitan Council with support from regional partners will implement the Metropolitan Council's 2030 Transit Master Study. Mn/DOT will support these efforts where appropriate.*

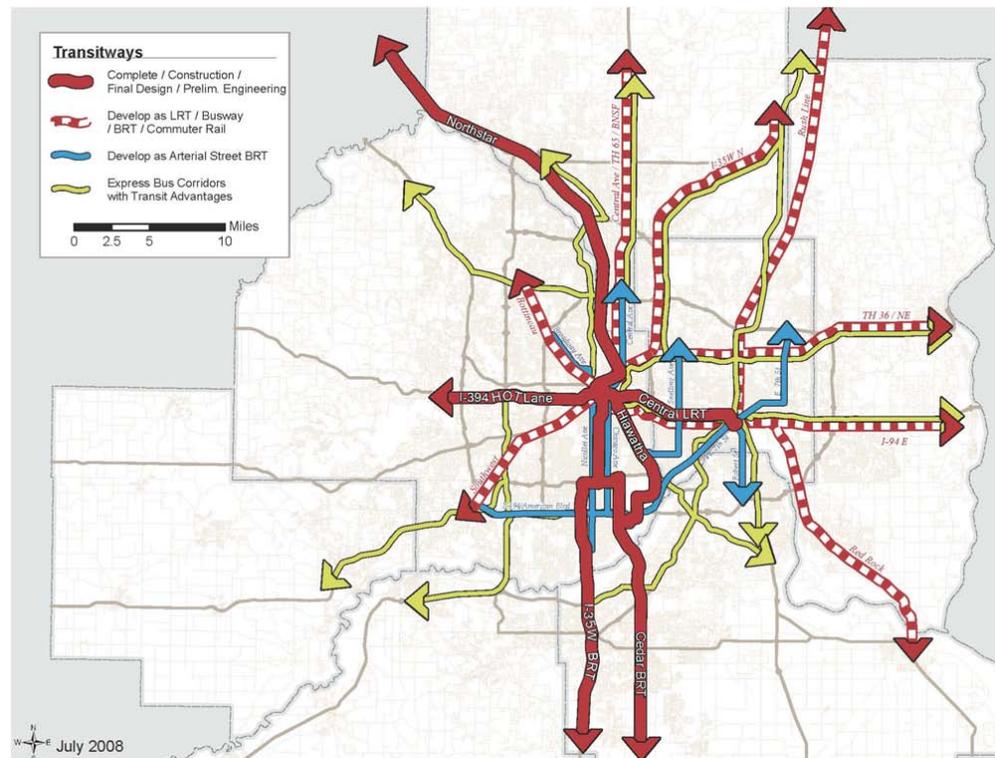
Transit is a major contributor to mobility within the region with an extensive system of regular route bus service presently in place as shown in Figure 7.6.4. Transit ridership has grown from 2003 to 2007. This recent surge in ridership can be attributed to several factors including the opening of the Hiawatha light rail transit (LRT) line, expansion of park and ride services, and rising parking and fuel costs. Other new transit services set to begin operations include the Northstar Commuter Rail Line (2009), and the Bus Rapid Transit (BRT) lines on Cedar Avenue and the I-35W corridor as part of the UPA project. The Metropolitan Council has developed a 2030 Transit Master Study that provides a long-range transit vision for the region. This vision includes:

- The major transitways illustrated in Figure 7.6.5, such as the Hiawatha LRT line, Northstar Commuter Rail Line, and I-35W BRT. In addition, other major expansions to the transit system are being planned and/or studied including the Central Corridor, Southwest Corridor and Bottineau Boulevard.
- Expanded bus service.
- Dial-a-ride services that are on-demand transit services provided by Metro Mobility as well as a number of other transit providers throughout the region.



**Figure 7.6.4 Regular Route Bus Service in the Twin Cities**

Source: Metropolitan Council



**Figure 7.6.5 Twin Cities Transitways to be Developed by 2030**

Source: Metropolitan Council

The 2030 Transit Master Study provides more options for mobility and complements the highway system which is expected to be congested. All transportation partners in the region including Mn/DOT and the Metropolitan Council will need to work together to implement this vision. This will include additional studies, design and construction.

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*Mn/DOT will continue to work with its partners to enhance transit advantages.*

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Mn/DOT will also continue to work with the Metropolitan Council and other transit providers to enhance transit advantages where feasible and to seek cooperative funding to enhance arterial corridors when upgrades are being planned. This will include continued development of park-and-ride, and/or park and pool lots in combination with bus only shoulders and other transit advantages such as signal timing, queue-jumping, ramp-meter by-passes, direct ramp access to parking facilities, and pullouts to accommodate bus stops on the mainline.

## 6E. Freight Movements

*Mn/DOT will work with its transportation partners to investigate barriers to freight movements and their potential solutions.*

Significant volumes of freight move to and through the TCMA each year. These movements supply residents with goods, provide businesses with supplies and raw materials, and help move finished goods or products to markets or distribution facilities. As the metropolitan area grows, the movement of goods will also increase. Most of these freight movements are made by trucks on the regional highway system.

Freight movements are a direct reflection of price and service needs and they can change mode and/or destination based on market demands. Mn/DOT supports a competitive, multimodal approach to freight movements that includes truck, rail, water, and air. In addition, Mn/DOT will work to manage the current highway system to improve travel-time reliability through a combination of strategic investments, transportation demand management, and operational controls that seek to smooth flows and improve throughput.

Mn/DOT will work jointly with the Metropolitan Council, local units of government and private sector transportation partners to conduct a Metro Freight Study that investigates freight flows, options for improving connections to intermodal terminals, and options for truck staging on the periphery of the metropolitan area which have potential to improve efficiency of overall highway operations during the peak travel periods. Mn/DOT will also work with these groups to support the investigation of other modes that could demonstrate reduced truck usage on the state highway system.

## **6F. Bicycle and Pedestrian Systems**

*Mn/DOT, the Metropolitan Council, and local units of government will support efforts to increase the share of trips made by bicycling and walking in the Twin Cities and develop and maintain efficient, safe and appealing pedestrian and bicycle transportation systems.*

Bicycling and walking in the Twin Cities are gaining popularity as means of daily transportation. As stated in the Metropolitan Council 2030 Transportation Policy Plan,

“The region is already known nationwide for its bicycle facilities and high levels of bicycling. The City of Minneapolis ranked second in the nation for bicycle commuting with 3.8 percent of all commute trips made via bicycle in 2007. The City of Minneapolis conducted counts in 2007 in and around downtown Minneapolis and found that bicycling had almost doubled since the last time counts were taken in 2003. In addition, daily traffic on the newly completed Minneapolis portion of the Midtown Greenway has reached levels over 5,000 on busy days. The increasing use of bicycle facilities demonstrates that people are looking for travel alternatives to the automobile for many of their trips.

The potential for bicycle transportation in metropolitan areas is great. According to U.S. Census Longitudinal Employer Household Dynamics data, approximately 20 percent of all employees who work in one of the major employment clusters in the Twin Cities live less than three miles from their workplace. Nearly 14 percent of all trips in the region are less than one mile long and close to 40 percent are less than three miles, according to the Council’s 2000 Travel Behavior Inventory. It’s possible that removing these travel barriers could result in a significantly higher proportion of trips made via walking or bicycling. Bicycles and pedestrians can be a significant element of the transportation

solution within and near congested activity centers because they accommodate this short-distance travel and require less space and infrastructure than automobiles.”

To bring this potential into reality, the Metropolitan Council, Mn/DOT, other state, and local units of government will continue to work together to fund, plan, and build a system of interconnected bicycle and pedestrian facilities. These include on- and off-road bicycle facilities as well as off-road pedestrian facilities with special emphasis placed on travel barrier removal and safety for bicyclists and pedestrians. The partners will continue working toward connecting these facilities to transit and making them accessible to people of all physical abilities.

## **Performance Measures and Indicators**

Performance measures and/or indicators provide quantitative information to managers and/or decision makers. This information is tracked over time to monitor performance and investment levels as well as the changes in performance given changes in levels of investment. Numerous performance measures and indicators have been either developed or identified for this policy area. A number of these measures and/or indicators are selected for representation and discussion within this policy and are **bolded** below. A full description of all performance measures and indicators associated with this plan is provided in Appendix D.

- **Travel Time Index (TTI) and National Ranking**
- **Duration and Extent of Congestion on Freeways**
- **Transit Ridership**
- Bus-Only Shoulders
- Incident Clearance
- Metro Signal Retiming on Arterial Routes
- FIRST Route Coverage
- Instrumented Principal Arterial Routes
- Regional Park-and-Ride Spaces

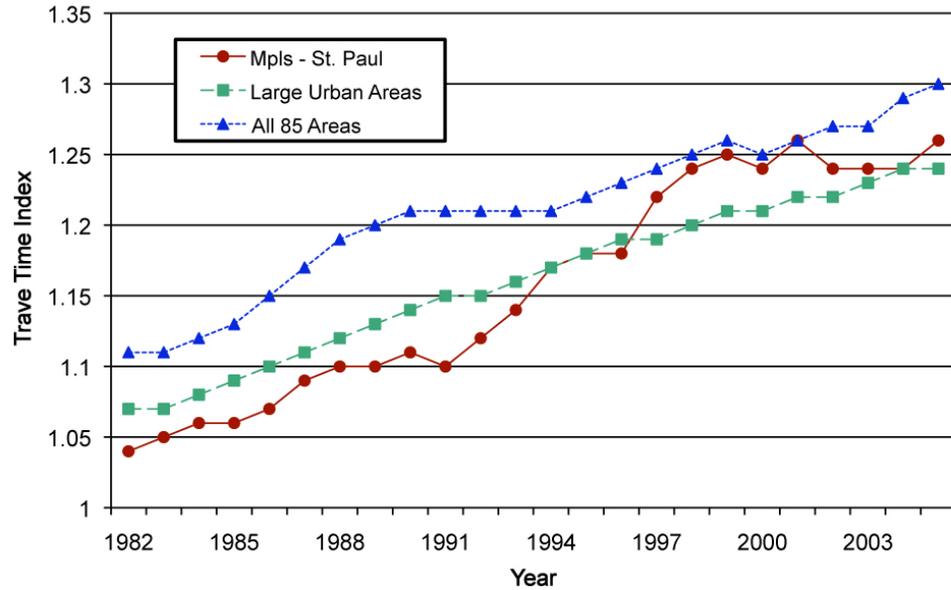
### *Developmental Measures*

- **Person Throughput**
- Duration and Extent of Congestion on Arterials
- Arterial and Freeway Travel Time Reliability
- Vehicle Throughput
- Metro Area Delay Estimates for Freight

## **Travel Time Index and National Ranking**

The Travel Time Index and corresponding national ranking are performance indicators developed by the Texas Transportation Institute at Texas A&M University. Data is available for the indicator beginning with 1982. The Travel Time

Index is, “the ratio of the travel time during the peak period to the time required to make the same trip at free-flow speeds. A value of 1.3, for example, indicates a 20-minute free-flow trip requires 26 minutes during the peak period.” Figure 7.6.6 illustrates the travel time index for the TCMA. From 1982 through 2005 the index increased from 1.04 to 1.26. The national ranking for the TCMA changed from 51st out of 85 cities in 1983 to 26th in 2005.



**Figure 7.6.6 TCMA Travel Time Index from 1982 to 2005**

Source: Mn/DOT Metro District

### Duration and Extent of Congestion on Freeways

This performance measure identifies the location and the duration of congestion on the Metropolitan Freeway System in half-mile increments.<sup>4</sup> Freeway congestion is defined as operating speeds below 45 miles per hour for one hour or more during peak periods. Operating the system at or above 45 mph will provide the maximum vehicle throughput. Therefore, allowing links on the system to degrade below 45 mph will reduce its overall carrying capacity and the system will be less efficient (carry fewer vehicles per hour).

According to the Metropolitan Freeway System 2007 Congestion Report (March 2008), a general upward trend has been observed since 1993. But notably, from 2004 through 2006, the Twin Cities Metropolitan Area experienced a decrease in miles of congested freeway. When adding 2007 data, the upward trend returns with the total number of congested miles increasing from 267 in 2006, to 305 in 2007. Figures 7.6.7 and 7.6.8 show the duration and extent of congestion in 2007.<sup>5</sup>

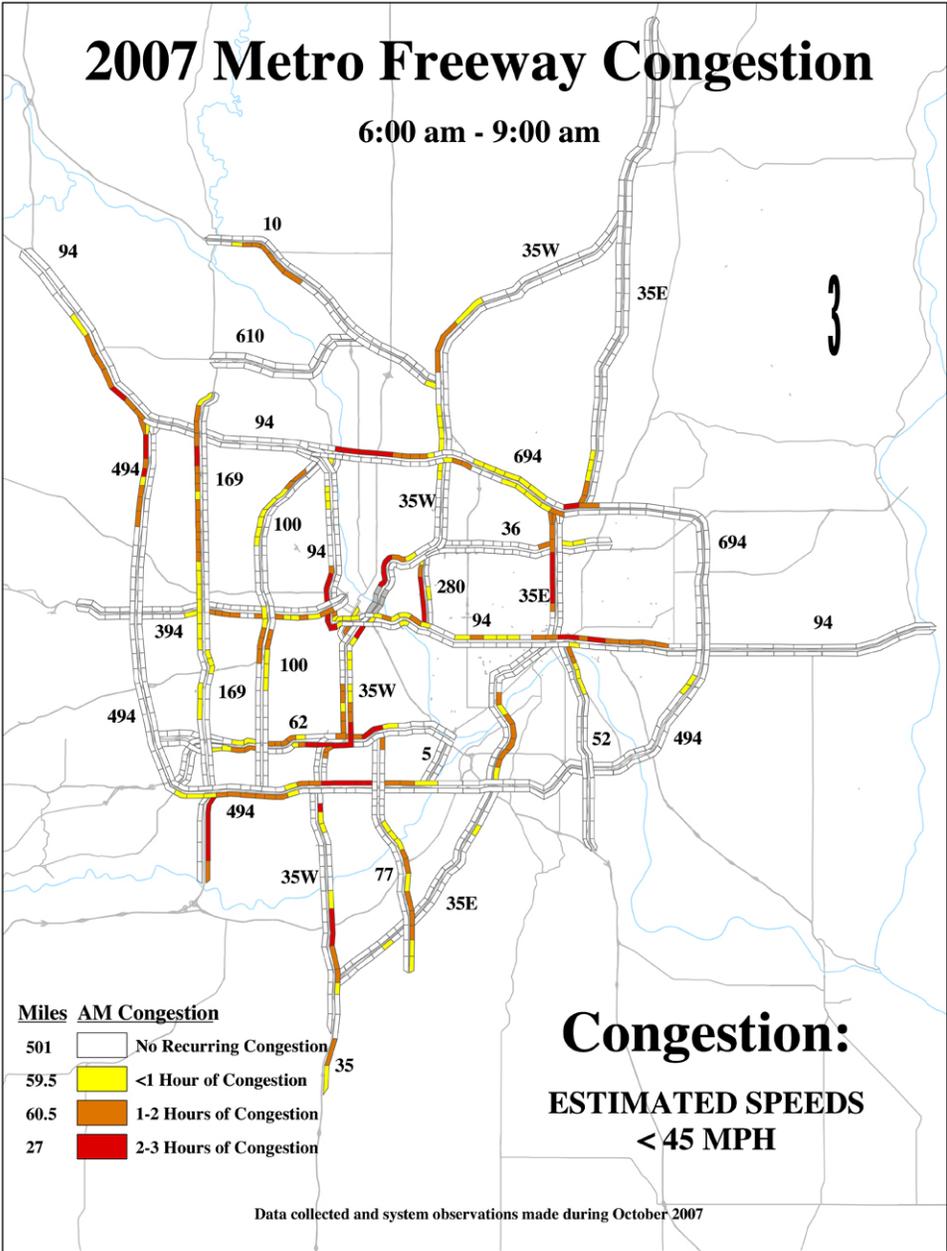
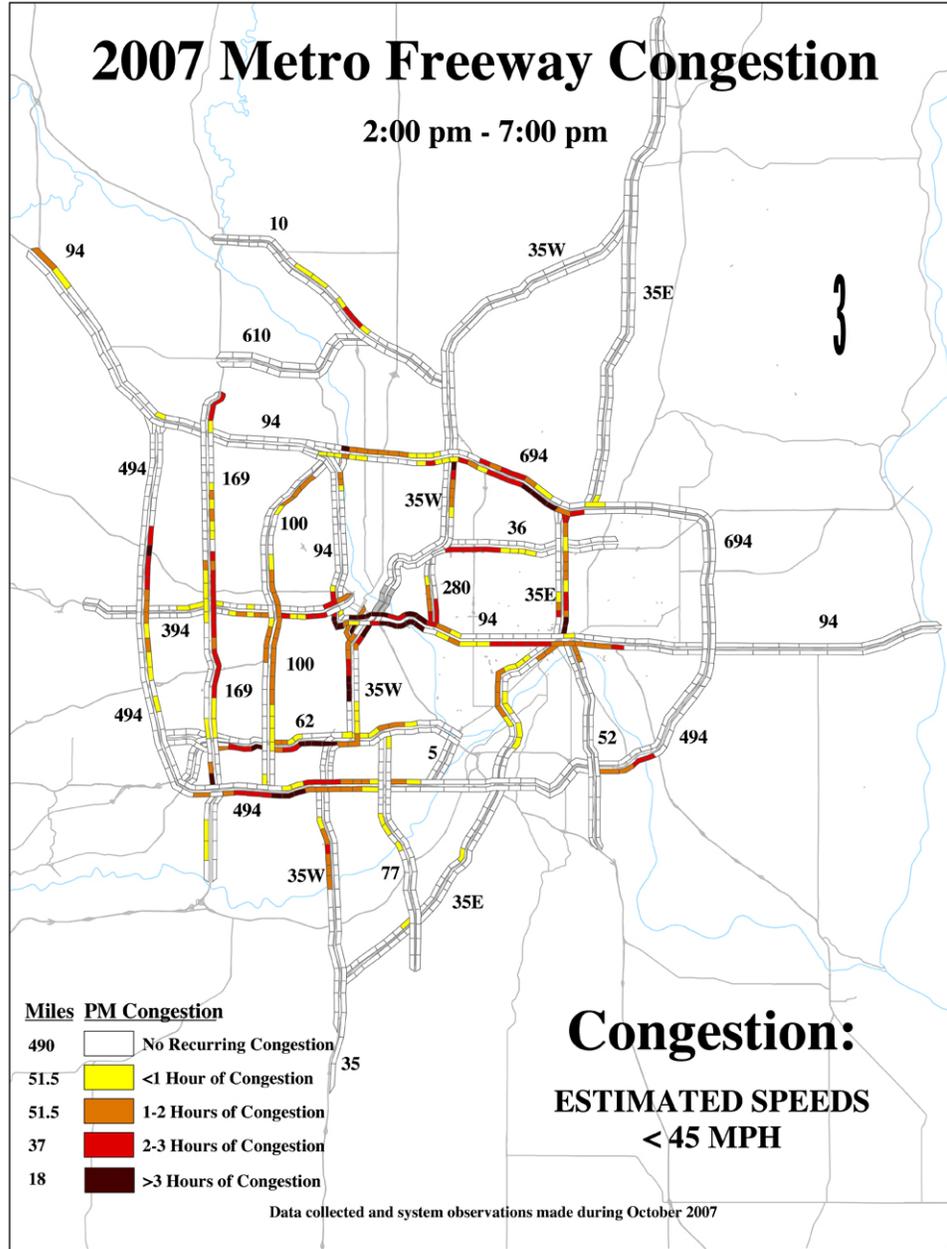


Figure 7.6.7 TCMA Duration and Extent of Congestion, AM Peak Period  
Source: Mn/DOT Regional Traffic Management Center



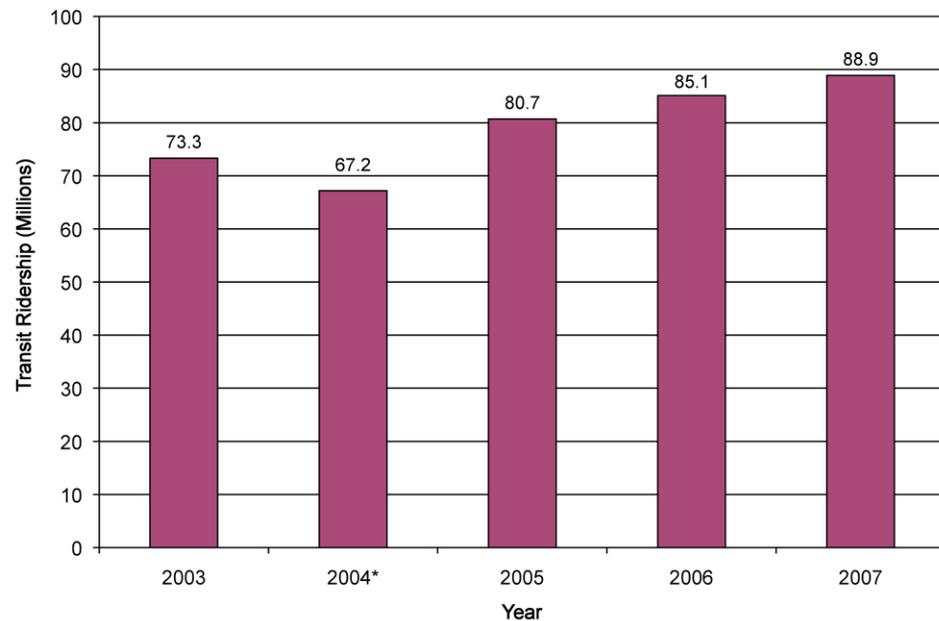
**Figure 7.6.8 TCMA Duration and Extent of Congestion, PM Peak Period**

Source: Mn/DOT Regional Traffic Management Center

### Transit Ridership

This performance measure tracks the number of people carried annually on transit throughout the TCMA. The measure aggregates ridership for all transit systems operating within the region, including Metro Transit bus and rail, Metro Mobility, contracted regular route service, suburban transit providers, vanpools, dial-a-ride, Northstar commuter service, and the University of Minnesota. Figure 7.6.9 illustrates ridership has increased by over 20 percent since 2003. Ridership in 2004 was down due to a 44 day transit strike. According to the Metropolitan Council 2030

Transportation Policy Plan, the target for the measure is to double 2003 transit ridership to 150 million rides by the year 2030.

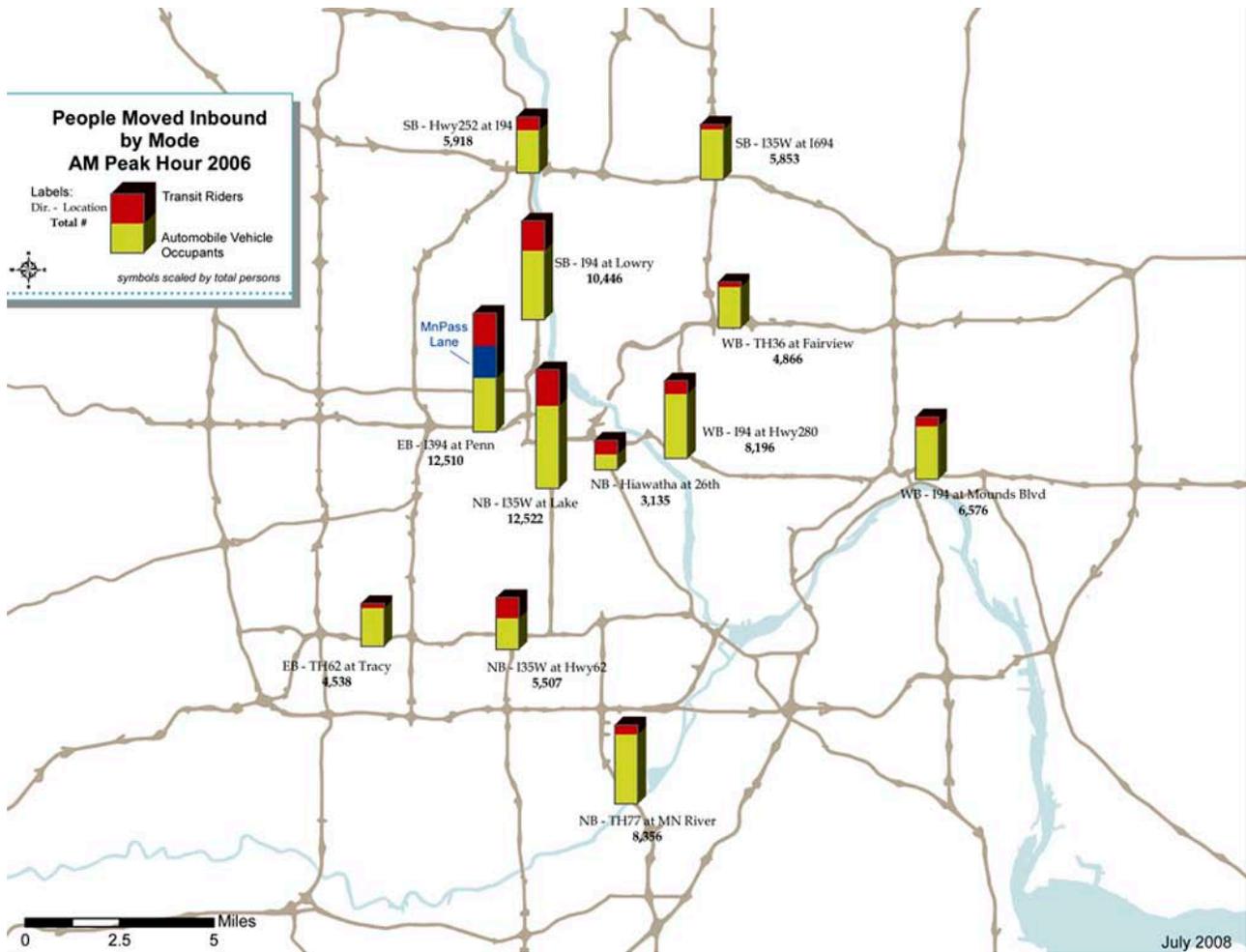


**Figure 7.6.9 Twin Cities Regional Transit Ridership from 2003 to 2007**

Source: Metropolitan Council

### Person Throughput

This indicator is in its initial stages of development with Figure 7.6.10 showing the result of initial steps toward measuring and reporting throughput on the freeway system. Mn/DOT will work with the Metropolitan Council and other transportation agencies and expects to develop this measure by the end of 2010. The measure is intended to provide a historical context for the number of people that transportation corridors serve/move as measured at key points throughout the TCMA. Information will be aggregated to show how person throughput changes over time. In addition, one of the strengths of this measure is that it can be used to compare modal alternatives.



**Figure 7.6.10 Freeway Transit Passengers and Highway Throughput**

Source: Metropolitan Council

<sup>1</sup> 2007 Urban Mobility Report, Texas Transportation Institute.

<sup>2</sup> Principal Arterial Study for the Twin Cities Metropolitan Area, Metropolitan Council and Mn/DOT, 2008.

<sup>3</sup> The UPA stands for Urban Partnership Agreement; Minnesota submitted a proposal and was awarded \$136 million in federal funds for innovative approaches to addressing congestion in the I-35W corridor.

<sup>4</sup> Congestion is measured on every Tuesday, Wednesday, and Thursday in October each year, typically a 12-day period.

<sup>5</sup> Data for duration and extent of congestion reflects travel conditions with the I-35W bridge and the I-35W/Highway 62 Crosstown Commons under construction, among other projects. It should be noted that congestion data is not normalized annually to account for ongoing construction.

## Policy 7: Greater Minnesota Metropolitan and Regional Mobility




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*A growing and aging population combined with shifts in the economy will put new demands on the transportation system in Greater Minnesota.*

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### Summary

**Provide for the changing transportation needs of people and freight traveling within Greater Minnesota regions and metropolitan areas by planning regionally for critical investments and improving coordination across modes and jurisdictions.** A growing and aging population combined with shifts in the economy will put new demands on the transportation system in Greater Minnesota. To address these changes, Mn/DOT will continue to work with the Metropolitan Planning Organizations (MPO), Regional Development Commissions (RDC) and other partners at the local and regional level to identify issues and opportunities for coordinated roadway, transit, bicycle-pedestrian, and freight system improvements. These improvements should focus on moving people and freight within Greater Minnesota regions and metropolitan areas and providing efficient connections to the larger statewide, national, and global transportation systems. Of particular importance will be the joint efforts to examine the changing needs for both transit and freight.

- 7A. Regional Planning:** Public and private entities, including tribal and local governments, MPOs, RDCs, transit providers, and Mn/DOT should collaboratively develop and advance regional approaches to multimodal transportation planning for Greater Minnesota.
- 7B. Planning the Roadway System:** Mn/DOT, MPOs, tribal and local governments will work together to plan for and maintain an interconnected network of roadways to serve mobility and access needs within each region.
- 7C. Planning the Transit System:** Mn/DOT, MPOs, RDCs, tribal and local governments, regional rail authorities and transit providers will work together to plan for and provide a coordinated transit system.
- 7D. Bicycle and Pedestrian Systems:** MPOs, RDCs, Mn/DOT, and tribal and local governments should continue working to provide appropriate regional bicycle and pedestrian systems in Greater Minnesota.
- 7E. Freight Systems:** MPOs, RDCs, tribal and local governments, regional rail authorities, port authorities, and Mn/DOT will work with state agencies, freight generators, shippers, and carriers to coordinate efforts to improve regional freight transportation in Greater Minnesota.

## Background and Context

Transportation needs of Greater Minnesota regions and metropolitan areas will be affected by many of the same overall demographic and economic changes Minnesota faces, including meeting the mobility needs of an aging population and providing for changes in freight types and movements. However, shifts in population and regional economics will not occur uniformly, requiring the use of varied strategies that ensure the mobility and access needs for travel within growing metropolitan and micropolitan areas will be met in the future. These strategies should also work toward providing efficient connections to the larger statewide, national, and global transportation systems. Multimodal transportation planning at the regional level requires the cooperation and coordination of regional development organizations such as the MPOs, RDCs, as well as tribal and local governments, regional rail authorities, transit providers, and Mn/DOT.

## Strategies

Planning, operating, and managing multimodal transportation systems at the metropolitan and regional level require significant coordination and cooperation between multiple public entities and private providers. This section presents strategies that Greater Minnesota transportation planning authorities and providers should use to develop coordinated and interconnected metropolitan and regional transportation systems. These systems should provide an appropriate level of access and mobility for all travelers and all types of freight. The specific mix of strategies employed will differ based on the demographic and economic shifts within each region or metropolitan area.

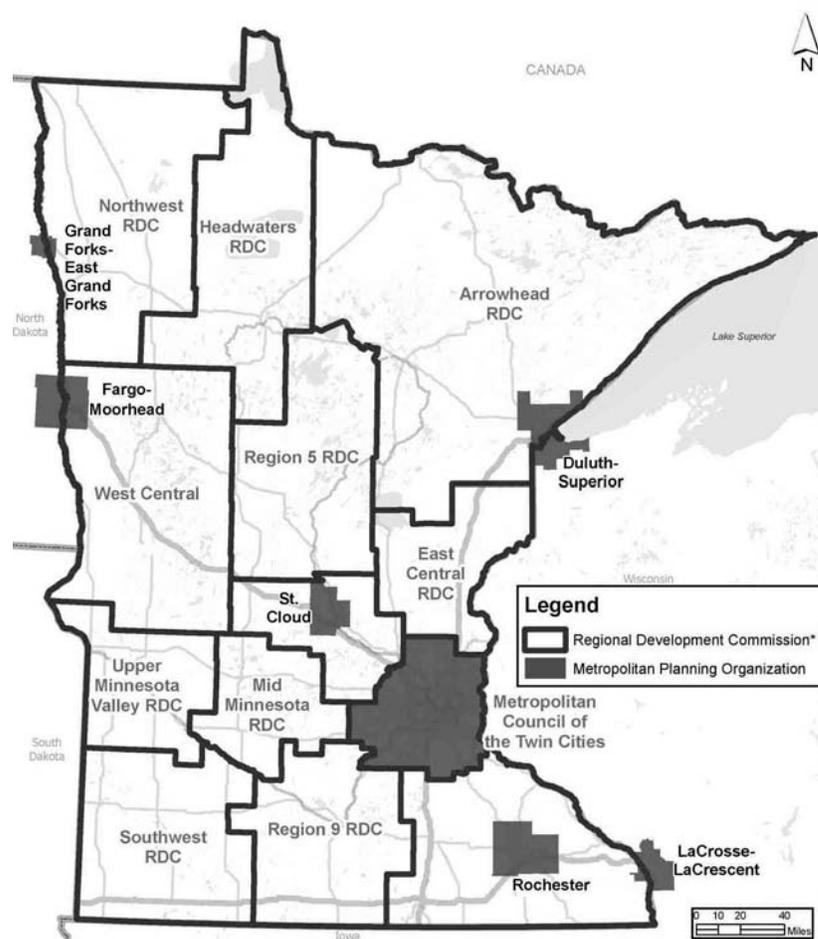
### 7A. Regional Planning

*Public and private entities, including tribal and local governments, MPOs, RDCs, transit providers, and Mn/DOT should collaboratively develop and advance regional approaches to multimodal transportation planning for Greater Minnesota.*

Much of the travel within regions and metropolitan areas involves facilities or services provided by multiple jurisdictions, including tribal governments, states, counties, cities, and townships. For example, Figure 7.7.1 shows four Greater Minnesota metropolitan areas (i.e., Duluth-Superior, Fargo-Moorhead, Grand Forks-East Grand Forks, and La Crosse-La Crescent) that straddle state, county, and municipal boundaries. Multiple jurisdictions increase the complexity of transportation system planning and operations at the regional or metropolitan level. Coordination among these jurisdictions, however, is necessary to ensure the development of a fully interconnected, multimodal transportation system.

*In metropolitan areas, the MPO has primary responsibility for multimodal transportation planning.*

Leadership in transportation planning comes from a variety of sources in Greater Minnesota. In metropolitan areas, the MPO has primary responsibility for multimodal transportation planning. Under federal law, MPOs are required to coordinate with affected jurisdictions to develop a multimodal transportation plan. This planning helps to ensure an integrated multimodal transportation system is developed within the metropolitan area and that federal, state, regional, and local resources are used effectively. Beyond the boundaries of the MPOs, Mn/DOT, RDCs, tribal governments, and local jurisdictions work together on the development of transportation plans. These planning efforts should work to reach beyond jurisdictional boundaries to be regional in nature and ensure coordination with and participation from all affected jurisdictions. Where needed, Mn/DOT will provide technical expertise to regions and metropolitan areas in support of their planning efforts.



\*Note: in RDC areas without a label, no RDC exists and Mn/DOT fills the role for transportation planning.

**Figure 7.7.1 Minnesota Transportation Planning Areas**

Source: Mn/DOT Office of Investment Management

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*In growth areas, transportation agencies should cooperatively plan to expand roadway systems to meet growth and economic needs.*

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## **7B. Planning the Roadway System**

*Mn/DOT, MPOs, tribal and local governments will work together to plan for and maintain an interconnected network of roadways to serve mobility and access needs within each region.*

Since the system of major highways serving Greater Minnesota is largely complete, Mn/DOT and local transportation authorities should focus primarily on maintenance and safety on the existing system and options for managing performance, with expansion planned only in growing areas where management alone cannot address transportation needs. These objectives can be accomplished through the following:

- a. All jurisdictions should focus significant emphasis on transportation investments toward safety and maintenance.
- b. All jurisdictions should continue to coordinate improvements within the context of adopted policy and long-range investment plans, including efforts to advance Mn/DOT district long-range highway investment plans.
- c. All jurisdictions should apply management strategies to preserve mobility on critical arterials within Level 1, 2, and 3 trade centers. Such strategies include signal retiming, intersection modifications, lane extensions, and access management techniques.
- d. Within metropolitan areas, the MPO should work with Mn/DOT and local jurisdictions to identify both appropriate corridor and system-wide strategies to improve roadway performance. Corridor strategies may include use of intelligent transportation systems, ramp meters, and transit prioritization. System wide strategies may include provisions for real-time traveler information, encouraging ride sharing through employer incentives, and construction of park-and-pool lots.

## **7C. Planning the Transit System**

*Mn/DOT, MPOs, RDCs, tribal and local governments, regional rail authorities, and transit providers will work together to plan for and provide a coordinated transit system.*

Consistent with direction being developed for the Greater Minnesota Transit Plan, the first priority for transit in Greater Minnesota will continue to be meeting the needs of the elderly, disabled, and low-income populations by coordinating services with other agencies as much as possible. However, there is a growing role for transit in addressing the needs of commuters through support for rideshare programs, establishing new services, and providing for park-and-pool and/or park-and-ride lots. Greater Minnesota transit systems can be enhanced in the following ways:

- a. In metropolitan areas, MPOs, transit agencies, and human service agencies should work together to evaluate transit needs and develop strategies to increase transit service and options. Beyond the core transit services, these organizations should consider the needs of emerging markets, such as commuters, and identify reasonable service, program, and facility options. Options could include new routes, expanded carpool and vanpool assistance, and park-and-pool and park-and-ride lots.

- b. Across Greater Minnesota, RDCs and planning commissions, tribal governments, rural transit providers, human service agencies, and local jurisdictions should continue to work toward strengthening and expanding core transit services. Improvements should focus on increasing service frequency and area of coverage, connecting to nearby services to facilitate longer distance travel, and establishing rideshare programs to address emerging commuter needs.

## 7D. Bicycle and Pedestrian Systems

*MPOs, RDCs, tribal and local governments, and Mn/DOT should continue working to provide appropriate regional bicycle and pedestrian systems in Greater Minnesota.*

While bicycle and pedestrian travel is generally local in nature, there is growing interest in linking systems together to allow uninterrupted travel across a region or metropolitan area. Coordination at the regional level is necessary to successfully develop these systems. For example, the system of scenic bikeways supports non-motorized travel in Greater Minnesota through a combination of low-volume highways and paved trails. This type of system makes efficient use of existing infrastructure and, with strategic additions, can meet the growing demand for safe, interconnected bicycle-pedestrian systems and serve as a model for development and implementation of regional systems throughout Greater Minnesota. To enhance regional bicycle and pedestrian systems the following strategies should be pursued:

- a. RDCs, tribal governments, local jurisdictions, Mn/DOT, and other agencies should coordinate their own efforts and work with advocacy and recreation groups to increase coordination between all partners.
- b. In metropolitan areas, MPOs and local jurisdictions should continue working to provide a system of interconnected bicycle and pedestrian facilities that support commuter and recreational travel.



*There is a growing interest in linking bicycle and pedestrian systems to support uninterrupted travel through larger areas.*

## 7E. Freight Systems

*MPOs, RDCs, tribal and local governments, regional rail authorities, port authorities, and Mn/DOT will work with state agencies, freight generators, shippers, and carriers to coordinate efforts to improve regional freight transportation in Greater Minnesota.*

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*Freight patterns have changed in Greater Minnesota and will continue to change in the future.*

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Freight patterns have changed in Greater Minnesota and will continue to change in the future. A shift toward larger grain elevators and to value-added processing facilities, such as ethanol plants in southwest Minnesota or new steel plants on the Iron Range, has brought about changes in vehicle weight and size, as well as routing. Large terminals and processing plants affect traffic patterns related to both delivery of raw materials and shipping of finished products or by-products. To ensure that freight continues to move smoothly within Greater Minnesota regions and metropolitan areas, several efforts will be undertaken, including:

- a. Consistent with Policy 5: Statewide Connections, Mn/DOT will work with its transportation partners to identify candidate highways for truck routes that supplement the IRC system.
- b. Mn/DOT will work to better understand regional freight issues, movements, and trends through the completion and periodic update of regional freight studies. These studies will be multimodal, identify freight issues in each region and in metropolitan areas, and also identify appropriate, cost effective solutions.
- c. Mn/DOT will work with its transportation partners to improve the level of freight information available to managers, decision-makers, and the public, including improving truck volume data and classification information on roadways.
- d. Conclusions and recommendations from regional freight studies should be considered in updates to local, regional, and statewide plans and they should be incorporated into future investment plans.

## **Performance Measures and Indicators**

Performance measures and/or indicators provide quantitative information to managers and decision-makers. This information is tracked over time to monitor performance and investment levels as well as the changes in performance given changes in levels of investment. Numerous performance measures and indicators have been either developed or identified for this policy area. One of these measures and/or indicators has been selected for representation and discussion within this policy and is **bolded** below. A full description of all performance measures and indicators associated with this plan is provided in Appendix D.

- **Congestion in Regional Trade Centers**
- Greater Minnesota Public Transit Bus Service Hours
- Greater Minnesota Transit Coverage
- Non-Auto Commuter Trips

### **Congestion in Regional Trade Centers**

This policy establishes a performance indicator for mobility based on the concept of Level of Service (LOS) as defined in the Transportation Research Board's Highway Capacity Manual. The performance indicator identifies a roadway corridor as warranting consideration for improvements when the forecasted average annual daily traffic (AADT) no longer provides satisfactory mobility (Level of Service falls below D). The AADT thresholds presented in Table 7.7.1 have been established to indicate when an urban corridor warrants further analysis and when drivers are likely to experience LOS F.

**Table 7.7.1 Regional Trade Center Urban Roadway Mobility Volume Threshold**

<b>Roadway Type</b>	<b>AADT Congestion Threshold (vehicles per day)</b>
2-lane Arterial	15,000
4-lane Arterial/Expressway	30,000
4-lane Freeway	75,000
6-lane Freeway	115,000
8-lane Freeway	155,000

*Source: Mn/DOT Office of Investment Management*



## Policy 8: Community Development and Transportation



### Summary

**Support local efforts to increase jobs, expand housing, and improve community livability through more coordinated planning, complementary design, and timely communication among land use and transportation authorities.** Transportation is a key ingredient to community livability and local economic development. Local governments must carefully consider and address the transportation needs and implications of their land use and community development decisions. Mn/DOT will work with regional and local partners as well as state agencies to promote the planning and development of local transportation systems that are sensitive to the community context, support local development goals, and conform to regional system plans.

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*Transportation is a key ingredient to community livability and local economic development.*

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- 8A. Metropolitan, Regional, or Corridor Planning for Transportation:** Tribes and local governments should participate in the transportation planning for their metropolitan area or region.
- 8B. The Land Use – Transportation Connection:** State and local authorities should consider the connection between land use and transportation in zoning, land use, and economic development decisions.
- 8C. Street and Development Design:** State and local government should seek to enhance quality of life in communities by coordinating the design of streets and developments.
- 8D. Compliance with Americans with Disabilities Act (ADA):** State and local governments should work to make their transportation systems ADA compliant.
- 8E. Networks for Timely Communication:** Mn/DOT and Metropolitan Planning Organizations (MPO) will take a stronger leadership role in establishing and maintaining an institutional framework for communication and sharing of land use and transportation plans and technical knowledge.

### Background and Context

The quality of life in every Minnesota community depends on many factors: the ability of residents to earn a living; the opportunity to live in a safe neighborhood; the availability of education, health services, shopping, and recreation; clean air and water; and the ability to travel safely and conveniently. Safe, convenient, and timely travel options are expected by residents and businesses throughout Minnesota.

Meeting these expectations will be challenging given the socio-economic trends in Minnesota and the revenue outlook for state and local transportation investments over the next decade. The competition for transportation funding is high due to the numerous needs of an aging infrastructure and the competition among local governments for access and capacity improvements. These transportation improvements support local economic growth and development.

A community's long-term development prospects can be hampered by inadequate transportation connections to the surrounding region and state. Community viability can also be hindered by poorly integrated street designs. At the same time, inadequate community planning and insensitive site development can severely reduce the effectiveness of the state and regional transportation systems.

Where interregional corridor planning is addressed in Policy 5 and the need for a metropolitan or regional approach toward transportation is addressed in Policies 6 and 7, Policy 8 focuses on the important planning and community development concepts and techniques that local governments should consider to promote more effective linkages between land use and transportation. It also identifies strategies to improve coordination among the many governmental jurisdictions, public agencies, and business associations engaged in the complex process of developing communities.

## Strategies

This section presents strategies that transportation and land use authorities can use to achieve Policy 8 objectives. Based on specific conditions and circumstances, the specific mix of strategies employed may be different from community to community.

### 8A. Metropolitan, Regional, or Corridor Planning for Transportation

*Tribes and local governments should participate in the transportation planning for their metropolitan area or region.*

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*Transportation investments provide access to land, enabling its development.*

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Land use and transportation are inextricably linked. Transportation investments provide access to land, enabling its development or redevelopment. Land development generates travel demand on the transportation system in the form of auto, truck, transit, bicycle, and pedestrian trips.

Because local planning and development decisions must be consistent with regional transportation plans, local governments should participate in the regional planning efforts. Tribes and local governments should develop and share land use plans with their regional partners and modify or adjust the plans so that a consistent vision for the transportation system is shared throughout the entire region. These plans should be multimodal, consist of roads that accommodate people and freight, and define major access points as well as transit and bicycle-pedestrian facilities.

### 8B. The Land Use-Transportation Connection

*State and local authorities should consider the connection between land use and transportation in zoning, land use, and economic development decisions.*

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*Greater coordination and long-term planning is needed to ensure land uses and transportation systems are in balance.*

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When planning local development and redevelopment projects, consideration should be given to the transportation improvements needed to support the proposed land uses. Transportation infrastructure changes typically require substantial lead times as well as significant investment of public funds. Public dollars and projects are often planned and programmed many years into the future, thus providing little opportunity to fund new projects unless others are deferred or additional funds are provided. Proposed land uses, on the other hand, are relatively flexible and can be tailored to fit an area or site. This suggests that greater

coordination and long-term planning is needed to ensure land uses and transportation systems are in balance.

Local and state government can do a number of things that ensure the transportation system successfully supports community development and redevelopment over the long-term, including:

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*Clustering development and locating freight generators on major highways, rail lines, or ports reduce the amount of infrastructure required.*

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- a. Local governments should develop comprehensive transportation plans that address all needs and are consistent with other state and regional transportation plans. These plans should provide a framework for guiding local transportation and land use decisions, and should include, at a minimum, a future functional classification system, number of travel lanes to accommodate future growth, identification of key access points, and locations of existing and future multimodal connections or facilities.
- b. Local governments can use their planning and zoning powers to guide land uses that make efficient use of the transportation system. Examples include clustering activity centers, organizing development into a mix of compatible land uses, and locating major freight generators adjacent to major transportation facilities. Clustering development and locating freight generators on major highways, rail lines, or ports reduce the amount of infrastructure required. At the same time, clustering development and creating a mix of compatible land uses, especially in metropolitan areas, creates opportunities for short trips, which could be made by transit, bicycling, or walking. Supporting land use density either from households/dwellings or employment is a significant factor in providing viable transit service and bicycle-pedestrian systems as well.

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*Local government can use its zoning powers to guide land uses that are compatible with major existing and planned transportation facilities*

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- c. Local governments can use their zoning powers to guide development consistent with metropolitan and regional plans for major access to the highway system. As discussed in Policy 7, the development and implementation of a regional plan for access to the highway system is a complex process that requires substantial investment. Local governments should carefully consider the location of major highway access points in land use decisions.
- d. Local governments can use their zoning powers to guide land uses that are compatible with major existing and planned transportation facilities such as major highways, ports, intermodal terminals, and airports. For example, safe zoning areas can be established around airports to increase safety during take offs and landings, and buffers or transitions areas can be developed around industrial land uses such as intermodal terminals to minimize potential impacts. Similarly, land uses serving people with special needs, such as schools serving children, can be sited sensitive to busy streets or intersections in ways that promote safe bicycle and pedestrian travel.
- e. State and local government can work to improve coordination between their transportation and economic development agencies. For example, local governments can consider the implementation of development review committees that make use of expertise from multiple agencies and/or departments, and provide a well-rounded review of projects in terms of land use and transportation. State government can also consider the implementation

of an economic development review committee consisting of economic development and transportation experts.

### **8C. Street and Development Design**

*State and local government should seek to enhance quality of life in communities by coordinating the design of streets and developments.*

Infrastructure improvements affect quality of life in communities both during and after construction. Mn/DOT and local governments can minimize negative effects using good project development and construction planning. These efforts will strive to reduce the overall footprint of the design on the community as well as minimize delays and detours during street construction, which may affect local businesses. Local government can do several things to ensure the coordination of street and development design, including:

- a. Local governments should require the completion of traffic impact studies for larger developments. When traffic studies are performed, all stakeholders better understand the transportation investments needed to support the development in the context of the overall transportation system. Guidance on traffic studies is available from Mn/DOT.
- b. Local governments should require that subdivision, other development, and redevelopment designs provide appropriate connections between neighborhood and regional road networks. This coordination ensures the transportation system will provide a good balance between mobility and access. Guidance on appropriate connections is available from Mn/DOT through its Access Management Guidelines.
- c. Local governments should require that subdivision, other development, and redevelopment designs support a system of interconnected streets, trails, and sidewalks that supplement the area's major highways and roads. These designs should support travel by multiple modes including transit, bicycles, pedestrians, emergency vehicles, vehicles servicing utilities, and commercial vehicle configurations, where appropriate. These designs better support cost-effective transit, bicycle and pedestrian travel, and the concept of Complete Streets.
- d. Local governments, within growing communities, should preserve right-of-way for expansion of major highways and arterials consistent with state, regional, and local plans.
- e. All transportation authorities should consider all modes and the appropriateness of Complete Streets as they develop and plan their transportation system. Mn/DOT is currently working with local governments to evaluate the feasibility and process needed to develop a Complete Streets policy.

Concurrently, Mn/DOT and local governments should work together in a number of ways to coordinate transportation and development design. Together, Mn/DOT and local authorities should use the Context Sensitive Solutions approach for the development and scoping of transportation projects within all neighborhoods and communities. This will help ensure the roadway development process and resulting projects reflect community values, setting, and character.

#### **8D. Compliance with Americans with Disabilities Act (ADA)**

*State and local governments will work to make their transportation systems ADA compliant.*

All transportation authorities will work to make transportation facilities compliant with the Americans with Disabilities Act (ADA). Currently, Mn/DOT's highway project development process provides accessibility by requiring new facilities and/or modifications of existing facilities to meet accessible design standards (e.g., ADA Accessibility Guidelines, Uniform Federal Accessibility Standards, Minnesota State Building Code). Furthermore, as discussed in Chapter 8, Mn/DOT is completing an ADA transition plan to identify existing physical obstacles in Mn/DOT facilities and to describe the methods that will be used to make the facilities accessible.

#### **8E. Networks for Timely Communication**

*Mn/DOT and MPOs will take a stronger leadership role in establishing and maintaining an institutional framework for communication and sharing of land use and transportation plans and technical knowledge.*

Timely communication among all transportation and land use authorities is essential to coordinate work as well as to provide a common understanding of both community development and transportation needs. This communication and understanding should occur at and between the local and state level, and should be promoted with all entities involved in land use, economic development and public works. Although communication and coordination efforts are required by environmental impact statement (EIS), environmental assessment (EA/EAW), and alternative urban areawide review (AUAR) processes, partners often find it to be too little, too late. Stronger coordination across jurisdictions and functional responsibilities is needed.

Building on the success of the Toward Zero Deaths (TZD) initiative (see Policy 1) and Area Transportation Partnerships (ATP), Mn/DOT Districts will work to develop new networking frameworks that facilitate timely and regular communication among all stakeholders regarding land use, transportation and infrastructure issues. Examples of issues include coordinating the replacement of local underground utilities during the reconstruction of a roadway and the location of new schools or major employment centers.

The frameworks will vary depending on the needs of the area and agencies or jurisdictions involved. Some areas have an institutional framework in place provided by the MPO or regional development commission (RDC). Mn/DOT will offer technical and organizational support in these areas. In other areas of Minnesota that do not have a framework in place, Mn/DOT will work with its local partners to develop a strong network. In either instance, Mn/DOT will work to involve not only

transportation and local public works and land use authorities, but also key state agencies involved in community development such as the Department of Employment and Economic Development, the Department of Agriculture, and the Department of Commerce.

### **Performance Measures and Indicators**

Performance measures and indicators provide quantitative information to managers, decision-makers, and the public. This information is tracked over time to monitor performance and investment levels as well as the changes in performance given changes in levels of investment. One performance measure has been identified for this policy area and is listed below. This measure is described in greater detail in Appendix D.

- Airport Airspace and Land that is Protected

## Policy 9: Energy and the Environment



### Summary

**Improve the energy efficiency and environmental sustainability of Minnesota's transportation system.** Mn/DOT and other transportation agencies will continue to protect and enhance the environment by integrating environmental stewardship in the planning, development, and construction phases of transportation projects as well as in system operations. Working in close coordination with other transportation system providers, Mn/DOT will also strive to reduce emissions and improve energy efficiency through the promotion of travel modes with high occupancy and/or low emission vehicles, increased use of alternative fuels, and adoption of property and right-of-way management practices more capable of offsetting greenhouse gas (GHG) emissions.

**9A. Environmental Stewardship in Project Development:** Mn/DOT and local transportation authorities will continue to integrate environmental stewardship throughout the transportation project development and system operations processes.

**9B. Emissions and Energy Consumption:** Mn/DOT will advance the emissions reduction objectives put forward by the Next Generation Act and increase the use of alternative fuels.

### Background and Context

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*Minnesota has a long-held public sector commitment and track record of environmental protection.*

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Since the late 1960s and early 1970s, when state and federal environmental protection regulations were first enacted, continual progress has been made in reducing environmental impacts related to transportation. Today, and into the future, there remains an expectation that transportation agencies act as responsible stewards of the environment and minimize the social, economic, and environmental impacts of transportation system development and operations (e.g., impacts on air, water, wildlife habitat and cultural resources). In Minnesota, this expectation is reinforced by a long held public sector commitment and track record of environmental protection. Mn/DOT and Minnesota's local transportation authorities strive to protect and enhance the environment by integrating environmental stewardship throughout the planning, development, and construction phases of projects as well as system operations. Mn/DOT will continue to work closely and communicate regularly with local, state, tribal and federal resource management agencies and the United States Department of Transportation (USDOT) toward this objective.

Climate change has emerged as an international concern, and efforts to curb greenhouse gas emissions have become an important public policy objective at the local, state, and federal levels of government. In Minnesota, the transportation sector is the source of an estimated 24 percent of greenhouse gases and, therefore, any comprehensive efforts to curb GHG emissions will likely involve transportation policy and practices. Opportunities for reducing GHG emissions from transportation include: increased use of alternatives fuels, use of vehicles with greater energy efficiency, and reducing the total number of vehicle miles driven, through the

provision of alternative modes (see policies 4 through 8). Each of these opportunities requires a combination of public and private sector involvement for implementation. Over the 20-year planning horizon of this plan, it is anticipated that efforts to increase energy efficiency and curb greenhouse gas emissions will only increase as important public policy concerns.

## Strategies

### 9A. Environmental Stewardship in Project Development

*Mn/DOT and local transportation authorities will continue to integrate environmental stewardship throughout the transportation project development and system operations processes.*

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*Over the next 20-year planning horizon, an effort to increase energy efficiency and curb greenhouse gas emissions will be a priority.*

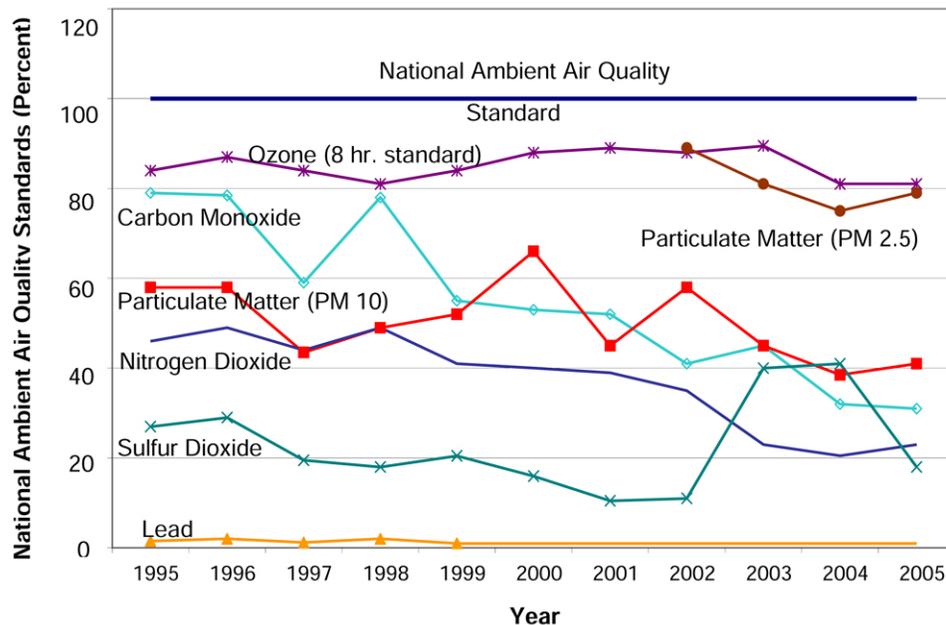
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Over the last 40 years, Minnesota transportation authorities have done their part to advance environmental stewardship by instituting guidance with proven results. Minnesota has instituted the guidance set forth in the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU) of 2005 for greater public and agency involvement and consultation in project planning and environmental review in an effort to better inform the transportation project planning process and develop mitigation strategies. Minnesota has instituted the guidance set forth by the Environmental Protection Agency (EPA) and Federal Highway Administration (FHWA) regarding which, when, and how mobile source air toxics are to be analyzed in the National Environmental Policy Act (NEPA) process.



*Energy cost fluctuations and more fuel efficient vehicles have affected travel behavior.*

Efforts such as these have led to proven results. For example, as shown in Figure 7.9.1, the Twin Cities Metropolitan Area has consistently met the National Ambient Air Quality Standards (NAAQS) for the six “Criteria” pollutants set by the National Office of Air Quality Planning and Standards even as vehicle miles traveled has grown significantly. This trend for pollutants, at least those attributable to the transportation sector, is expected to continue to decline and forecast to remain in compliance with the standards even though they were modified in May 2008 to make standards for ozone and particulate matter more restrictive.



**Figure 7.9.1: Trends in Criteria Air Pollutants in the TCMA from 1995 to 2005**

Source: Minnesota Pollution Control Agency, 2007 Report to the Legislature

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*Support and implement system level solutions rather than addressing mitigation only at the individual project level.*

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While some more traditional concerns regarding environmental stewardship have begun to dissipate, others remain. Water quality continues to be regulated by strict federal, state and local regulations. Regulations relevant to transportation facilities primarily include erosion control during construction and the detention/treatment of storm water runoff. Groundwater protection can also be a factor for projects in wellhead protection areas. Wetland impacts from transportation projects continue to be subject to federal and state wetland regulations requiring avoidance, minimization and mitigation of impacts.<sup>1</sup>

Mn/DOT and local transportation authorities will continue to integrate environmental stewardship beginning with long-range planning and continuing through project development and system operations by doing the following:

- a. Maintain and enhance regular communication and collaboration with resource management agencies. Identify additional opportunities to develop formalized programmatic agreements or memorandums of understanding. A collaborative approach to planning and project development stages will allow transportation agencies to effectively avoid or minimize environmental impacts.
- b. Continue to support and implement system level solutions to mitigation requirements as well as at the individual project level. Mn/DOT has been using programmatic approaches to mitigation long before suggested in SAFETEA-LU. Wetland banking and cultural resource investigation/mitigation are systems level approaches to project mitigation. Mn/DOT has developed a longstanding wetland banking system in cooperation with federal and state wetland resource and regulatory agencies. This interagency team has evolved this system so that it is compatible with state and federal regulatory requirements. Mn/DOT has an agreement with the Minnesota Board of Water and Soil Resources to operate this system and develop wetland sites so that acceptable wetland mitigation credits are available for projects as needed. Programmatic approaches are also

used in the cultural resource area. Programmatic statewide cultural resource investigation have been developed for archeological sites (MnModel), historic bridges, railroads and farmsteads. A programmatic agreement on pre-1955 historic bridges has resulted in the preservation and ongoing maintenance of 24 representative historic bridges as mitigation for unavoidable project impacts to other potentially historic bridges. Additional areas for programmatic investigation and mitigation to promote project streamlining will continue to be developed.

- c. Strive to improve compliance with environmental regulations in all aspects of operations. Mn/DOT will continually measure its regulatory compliance rates and modify practices accordingly. Mn/DOT will work with resource agencies to establish agreed upon best practices. For example, as the mobile source air toxics science progresses and FHWA updates its guidance, Minnesota will respond to the guidance set forth by EPA and FHWA.
- d. Mn/DOT will provide technical assistance and communicate best practices and solutions, including water quality management best practices, with both internal and external customers.

## 9B. Emissions and Energy Consumption

*Mn/DOT will advance the emissions reduction objectives put forward by the Next Generation Act and increase the use of alternative fuels.*

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*Minnesota has become a national leader in adopting renewable fuel and fuel efficiency practices.*

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In 2007, the Minnesota Legislature passed the Next Generation Act that calls for a carbon dioxide emission reduction of 15 percent by 2015, 30 percent by 2025, and 80 percent by 2050 (base year was 2005). National, regional and state studies and commissions have generated multiple strategy recommendations for meeting these goals. Specific strategies for curbing greenhouse gas emissions from the transportation sector have focused largely on reducing the number of vehicle miles traveled, reducing the amount of carbon per unit of fuel (expanded use of alternative fuels), and improving vehicle miles per gallon. Although at the writing of this plan, none of the strategies or proposed policies has been formally adopted, it is expected that the objectives put forth will have an impact on transportation policy and system operations in the future.

The State of Minnesota and particularly state government has become a national leader in adopting renewable fuel and fuel efficiency practices. Citing long-term energy security, and environmental and economic goals, Governor's Executive Order 06-03 calls upon all state agencies and state employees to strengthen the infrastructure to increase the availability and use of alternative fuels and to use alternative fuels in state vehicles whenever practical. In addition to making the transition to E-85 for its light-duty vehicles, Mn/DOT is experimenting with the use of B20, a higher blend of bio-diesel, in its heavy-duty fleet. Furthermore, Governor's Executive Order 04-10 calls for increased fuel efficiency of vehicles, including and not limited to use of hybrid electric cars and hydrogen powered vehicles.

Mn/DOT will advance the emissions reduction objectives put forward by the Next Generation Act and increase the use of alternative fuels by doing the following:<sup>2</sup>

- a. Promote the use of transportation modes with high occupancy and/or low pollutant emissions to help reduce energy demands and the emission of

greenhouse gases and other pollutants. As discussed in Policies 4, 5, 6, 7, and 8, examples of these transportation modes include rail and waterway for freight along with intercity bus, intercity passenger rail, transit, ridesharing through carpools or vanpools, biking, and walking for people.

- b. Increase energy conservation practices and the use of renewable supplies in the management of facilities and fleets.
- c. Explore methods for managing Mn/DOT right-of-way and properties in ways that more effectively offset greenhouse gas emissions.

## Performance Measures and Indicators

Performance measures, indicators, and targets provide quantitative information to managers and/or decision makers. This information is tracked over time to monitor performance and investment levels as well as the changes in performance given changes in levels of investment. Several performance measures and indicators have been either developed or identified for this policy area. A number of these measures and/or indicators are selected for representation and discussion within this policy and are **bolded** below. A full description of all performance measures and indicators associated with this plan is provided in Appendix D.

- **Compliance with Criteria Air Pollutant Standards**
- **Mn/DOT use of Cleaner Fuels**
- National Pollution Discharge Elimination System Compliance – Erosion Control
- Wetlands Affected and Replaced

### *Developmental Measures*

- Carbon Dioxide Emissions from the Transportation Sector

## Compliance with Criteria Air Pollutant Standards

Mn/DOT will continue to monitor and report on this measure. It tracks the Twin Cities Metropolitan Area's (TCMA) compliance with federal standards for outdoor levels of ozone, nitrogen dioxide, carbon monoxide, and particulate matter. Data for outdoor levels of ozone, nitrogen dioxide, carbon monoxide, and particulate matter will be collected by the Minnesota Pollution Control Agency. Performance will be measured as a percent of the NAAQS. TCMA air quality presently meets federal standards. The expectation is that TCMA air quality will continue to be at or better than the federal standards. Performance for this measure is illustrated in Figure 7.9.1.

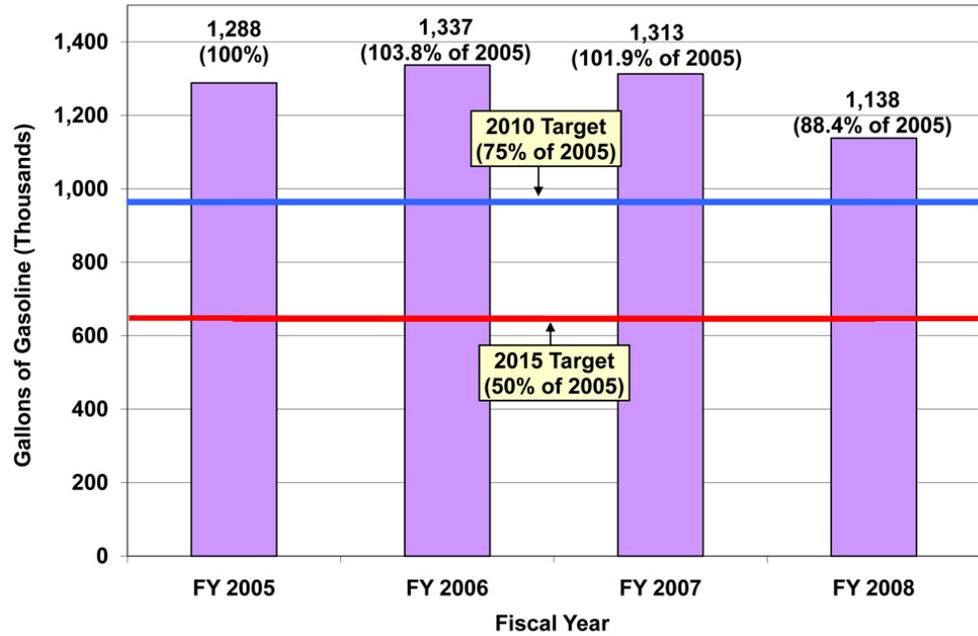
## Mn/DOT Use of Cleaner Fuels

Mn/DOT will continue to monitor the use of cleaner fuels by State of Minnesota vehicles. This measure tracks the gallons of gasoline purchased for use in Mn/DOT on-road vehicles. Based on targets established by Executive Order 04-10, issued in September 27, 2004, and using 2005 as a baseline, the state shall do the following:

- Reduce the use of gasoline by on-road vehicles owned by state departments by 25 percent by 2010 and by 50 percent by 2015.

- Reduce the use of petroleum-based diesel fuel used by state departments by 10 percent by 2010 and by 25 percent by 2015.

Figure 7.9.2 shows that Mn/DOT has not yet met the 2010 gasoline consumption target for its on-road vehicles.



**Figure 7.9.2 Mn/DOT Fleet Gasoline Consumption by Year**

Source: Mn/DOT Fleet Management

<sup>1</sup> Also known as sequencing.

<sup>2</sup> These strategies are consistent with the guidance for improved streamlining and greater collaboration/public involvement set forth in SAFETEA-LU, as well as state and federal policy trends favoring increased energy efficiency, use of alternative fuels and reduction in GHG emissions.

## Policy 10: Accountability and Transparency



### Summary

**Strengthen accountability and transparency in the delivery of Minnesota's transportation system.** To strengthen accountability and transparency in its decision-making, Mn/DOT will set clear and measurable objectives, track progress toward meeting objectives, and report results on a regular, ongoing basis to policymakers and the traveling public. Mn/DOT will develop new approaches and venues to proactively and regularly engage partners and stakeholders in the decision making process at both the project and broader system levels. A new project scoping, cost estimating, and cost management process will improve Mn/DOT's ability to deliver projects on time and within budget.

- 10A. Strengthen Performance Tracking and Reporting:** Mn/DOT will promote accountability by setting clear and measurable objectives, tracking progress, and regularly reporting results.
- 10B. Implement New Project Scope, Cost, and Schedule Controls:** Mn/DOT will implement new project scoping, cost estimating, and cost management processes to improve Mn/DOT's ability to deliver projects within the schedule and budget promised to the public, contractors, and affected communities.
- 10C. Strengthen Stakeholder Involvement:** Mn/DOT will increase stakeholder involvement and encourage input in its transportation planning and decision making through organizational enhancements and process improvements.
- 10D. Communicate Needs and Proposed Approach:** Mn/DOT will strive to improve stakeholders' understanding of how Mn/DOT identifies and addresses needs in the planning and management of the state transportation system through expanded dialog and enhanced reporting.

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*Accountability and transparency requires clearly stated and measurable objectives and regular progress reports.*

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### Background and Context

To operate effectively and to meet the policy objectives set forth in this plan, it is essential that transportation agencies establish and continually cultivate the public's trust and confidence. Transportation agencies must proactively seek public input and continue to encourage the public's involvement in developing transportation plans and guiding investment decisions. Agencies must also ensure that decisions clearly support policy objectives. Accountability and transparency requires clearly stated and measurable objectives and regular progress reports. In the context of this plan, accountability and transparency are defined as follows.

### Accountability

Collectively, transportation agency accountability can be measured by the degree to which the agency is able to deliver planned projects and by how consistent investment and operational decisions are with established priorities.

## Transparency

Transparency means achieving accountability for public expenditures by proactively and regularly involving stakeholders. Transparency is achieved when an agency's planning process, investment decision making criteria, program status, and performance results are accessible and understandable to the Legislature, transportation stakeholders, and the general public.

Transparency at Mn/DOT includes providing stakeholders with information, engaging them in the decision making process, and working collaboratively with them to identify and refine the objectives of the agency and to develop strategies to meet these objectives.

## Strategies

### 10A. Strengthen Performance Tracking and Reporting

*Mn/DOT will promote accountability by setting clear and measurable objectives, tracking progress and regularly reporting results.*

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*Mn/DOT will set performance objectives that align with stated policy priorities.*

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Mn/DOT will set performance objectives that align with stated policy priorities in the areas of safety, mobility, community and economic development, and system preservation; invest to meet those objectives; measure progress; and innovate and adjust to stay on course.

Mn/DOT currently uses performance criteria to guide capital investments and annual operational budgets. System and agency performance results are regularly reviewed at all levels of Mn/DOT management. The ongoing measurement and review process assists Mn/DOT in evaluating the efficiency of service delivery and assessing the effectiveness of program activities. This objective based approach enhances accountability and prompts innovation by keeping the focus on the outcome.

### 10B. Implement New Project Scope, Cost, and Schedule Controls

*Mn/DOT will implement new project scoping, cost estimating, and cost management processes to improve Mn/DOT's ability to deliver projects within the schedule and budget promised to the public, contractors, and affected communities.*

It is Mn/DOT's objective that the sum of project costs included in the four-year Statewide Transportation Improvement Program (STIP) will not exceed reasonable revenue forecasts, resulting in a program that reflects only those projects that can be realistically delivered. Meeting this objective will require greater certainty in project scope and cost estimates.

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*Changes to project scope and underestimation of project costs are two of the primary causes of cost overruns, and subsequently, delays in program delivery.*

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Changes to project scope and underestimation of project costs are two of the primary causes of cost overruns, and subsequently, delays in program delivery. Mn/DOT will address this through two initiatives: 1) establishment of a uniform and comprehensive project scoping process and 2) development and implementation of consistent project cost estimating and cost management (CE/CM) procedures and supporting policies.

When poorly scoped projects are included in the four-year STIP significant modifications are often required prior to the project being let for construction. If the scope of a project increases, the change can have a ripple effect throughout the entire four-year construction program. To address these issues, Mn/DOT adopted new policies in 2007 requiring a comprehensive and rigorous scoping process to be completed and documented before a project can be entered into the STIP.

Escalation of project costs at any stage of project development can have a negative impact on the entire STIP. The objective of the CE/CM initiative is to adopt formal processes and tools for project cost estimating, cost estimate management, and cost control that can be uniformly applied statewide. Mn/DOT is committed to making the organizational changes and dedicating the resources necessary to apply the tools and processes developed during this effort. Beginning in 2009, Mn/DOT will adopt and phase in the needed organizational changes and the use of formal processes, protocols, and communications related to program cost management and control, including:

- Define requirements for projects to enter the four-year STIP, which will include scoping report and baseline cost estimate and identify a project contingency (in year-of-construction dollars).
- Establish formal review of project cost variation, including documentation, timing and accountability.
- Establish an authorization process and chain of responsibility for the approval of cost variations.
- Uniformly apply tools to address risk in the estimation process.

The impact of these new policies will be reflected in annual program delivery performance.

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*Mn/DOT will introduce a series of Commissioner Forums to engage state and national leaders.*

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### **10C. Strengthen Stakeholder Involvement**

*Mn/DOT will increase stakeholder involvement and encourage input in its transportation planning and decision making through organizational enhancements and process improvements.*

Mn/DOT is committed to engaging stakeholders in the establishment of objectives and the selection of strategies to meet these objectives. Mn/DOT will employ the following methods to ensure meaningful input from the stakeholders.

- a. Mn/DOT will continue to improve organization and approach to foster greater stakeholder access and involvement in decision making. To accomplish this objective, several changes have been made, including:
  - Adding a Transportation Ombudsman who will be responsible for independently investigating complaints from the public and determining

whether the department's decision making may have been unreasonable, unfair, arbitrary, or improper.

- Establishing an Office of External Partnering to actively seek input from the department's partners.
  - Expanding the role of market research as a function within the organization. Market research is a customer based technique used to inform planning and operational decisions. It is a tool for developing a greater understanding of Minnesota citizen's priorities and level of satisfaction with transportation investment decisions and services.
  - Introducing a series of Commissioner Forums to engage state and national leaders in discussions of the emerging transportation issues. Additionally, the Legislature has established a Transportation Strategic Management and Operations Advisory Task Force to recommend areas for organization and operational improvements.
- b. Mn/DOT supports Context Sensitive Solutions (CSS) as a policy and approach to project selection and design. The Federal Highway Administration defines CSS as "a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total context within which a transportation improvement project will exist." Furthermore, CSS principles require early, continuous and meaningful involvement of stakeholders and the public throughout the project development process. Engagement is a critical component to successful use of CSS principles.
- c. Mn/DOT will support the development of public involvement skills for its agency and its partners by providing "Hear Every Voice" training and guidance statewide. Mn/DOT's Hear Every Voice initiative seeks to support employee learning and implementation of effective public participation. It is based on the principle that engaging the public is not an option but an essential requirement. The initiative acknowledges that public input is critical in every aspect of Mn/DOT's day-to-day business, including funding decisions, programming, planning, community and partner relations, and statutory and political requirements.

#### **10D. Communicate Needs and Proposed Approach**

*Mn/DOT will strive to improve stakeholders' understanding of how Mn/DOT identifies and addresses needs in the planning and management of the state transportation system through expanded dialog and enhanced reporting.*

As part of the outreach effort for this statewide plan update, regional and local transportation stakeholders were given the opportunity to identify and discuss transportation issues. A recurring theme was the need for Mn/DOT to do a better job of "telling the story" (that is, describing the transportation needs and revenue forecasts to both elected officials and the general public). Stakeholders also expressed a need for better understanding of funding sources and how projects are selected.

This desire for transparency extends to the Legislature. The 2008 Minnesota Legislature (Laws of Minnesota 2008, Chapters 152, 287, 350) mandated 28 transportation related reports or studies for which Mn/DOT is either directly responsible or plays a significant supporting role. Although the reports and studies identified in the legislation cover a wide range of subjects, many are requests for detailed and comprehensive reports on current agency practices, programs and projects.

- a. Mn/DOT will expand its dialog with Area Transportation Partners (ATP) to include a broader discussion of revenue projections, system performance trends, project status, and program decision making processes and criteria.
- b. Mn/DOT's investment process uses eight regional partnerships called Area Transportation Partnerships. ATPs include representatives from metropolitan planning organizations, regional development commissions, cities, counties, townships, transit providers, tribal governments, other interested parties, and Mn/DOT. ATPs are responsible for recommending a four-year program for federally funded projects. Mn/DOT will conduct regular interactive meetings with these local partners at least annually to foster a greater shared understanding of issues and procedures.
- c. Mn/DOT will expand and standardize reporting to the Legislature and the public. Mn/DOT will present regular reports to the Legislature on the internal performance management practices and reports developed over the last 15 years. Reports will provide status on the condition and performance of the transportation system, fiscal needs, and key issues and the progress on key initiatives (e.g., bonding projects, legislatively mandated projects and programs). Mn/DOT will present to the Legislature at least annually and to legislative staff biannually or quarterly.

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*Mn/DOT will also expand the use of its website to increase the availability and accessibility of information.*

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Mn/DOT will also expand the use of its website to increase the availability and accessibility of information on transportation system performance, project status, and program decision-making processes and criteria. Currently, Mn/DOT publishes an annual Department Results Scorecard that shows the degree to which Mn/DOT is meeting its 13 top department performance measures. Mn/DOT will reshape, update, and expand the scorecard to better reflect new priorities and allow for increased public understanding of Mn/DOT's objectives and status in meeting those objectives.

## **Performance Measures and Indicators**

Performance measures, indicators, and targets provide quantitative information to transportation authorities and decision makers. This information is tracked over time to monitor progress. Several performance measures and indicators have been either developed or identified for this policy area. A number of these measures and/or indicators are selected for representation and discussion within this policy and are **bolded** below. A full description of all performance measures and indicators associated with this plan is provided in Appendix D.

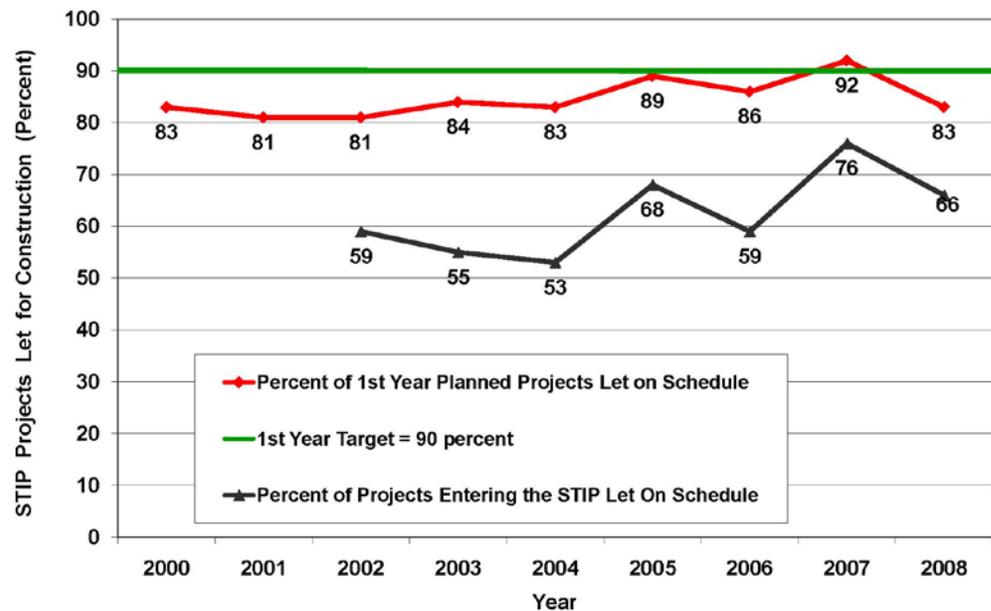
- **Projects Let on Schedule, STIP Projects, Current Year**
- **Projects Let on Schedule, STIP Projects, Fourth Year**
- Construction Cost Overruns
- **Customer Satisfaction with Reliability of Mn/DOT Communications**

### *Developmental Measures*

- Variation in Total Project Cost
- Number and Value of Contract Amendments (Supplemental Agreements) During Construction

### Projects Let on Schedule (Current and Fourth Year)

Every year, Mn/DOT commits to a four-year published program of transportation projects, the Statewide Transportation Improvement Program (STIP). This program includes projects of all sizes and types throughout the state. To enhance accountability for delivering projects on schedule, Figure 7.10.1 shows Mn/DOT has established two measures to track the letting of projects listed in the STIP. The first measure focuses on projects in the first year of the STIP and tracks the percent that are let for construction in that year; the target for this measure is 90 percent. The second measure focuses on projects entering the STIP and tracks the percent that are let for construction in the planned year or earlier; the target for this measure is 60 percent.



**Figure 7.10.1 Mn/DOT Project Letting Timelines 2000 through 2008**

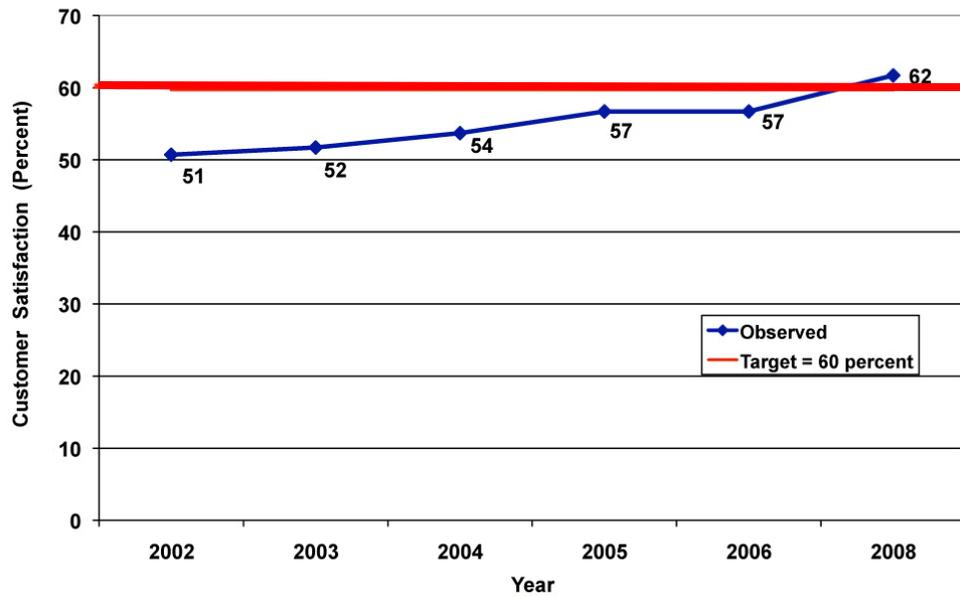
Source: Mn/DOT Office of Project Scope and Cost Management

Projects enter the STIP four years in advance of their scheduled letting date. The performance target is to have 60 percent of these projects let by the end of that fourth year as scheduled. For projects that are scheduled to be let in the next year (first year planned projects), much greater certainty of schedule is expected and, therefore, the target is higher, 90 percent.

Improvements to Mn/DOT's cost estimating, cost management, and scoping processes are expected to improve project timeliness and program certainty in the coming years.

### Customer Satisfaction with Reliability of Mn/DOT Communications

Customer perceptions are measured annually through the Omnibus survey. The Omnibus is a telephone survey of a representative statewide sample of 800 citizens. Each year customers are asked the question; “Thinking about all the different communications provided by the Department of Transportation, how reliable are these communications in your opinion?” Respondents use a 1-10 scale to rate the reliability of Mn/DOT communications, 1 being low and 10 being high. This is a measure of the percent of respondents to the survey that rate reliability at 7 or higher. The target for this measure is 60 percent. Results for 2002 through 2008 are shown in Figure 7.10.2.



**Figure 7.10.2 Percent of Customers Satisfied with the Reliability of Mn/DOT Information**

Source: Mn/DOT Office of Policy Analysis, Research, and Innovation

Additional transparency performance measures are being developed to assess the agency’s effectiveness in establishing and maintaining public trust.

## Chapter 8: Future Plans and Studies

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Many issues and proposed strategies identified in this plan will require further in-depth analysis and consultation among partners, stakeholders, and policymakers. Several key studies and investment plans are currently underway or will be initiated soon to study and expand upon the policies and strategies of this plan. These studies are summarized below.

### **Greater Minnesota Transit Plan**

The update of the 2001 Greater Minnesota Transit Plan is scheduled for completion in 2009. The plan will define the future vision for public transportation across Greater Minnesota and focus on the needs of four target market groups: the elderly, low income, disabled, and commuters. It will identify strategies to guide investments to both maintain and expand current transit services across the state.

### **Greater Minnesota Transit Implementation/Investment Plan**

In 2008, the Minnesota Legislature directed Mn/DOT to develop a transit implementation plan that includes an analysis of ridership and transit service needs throughout greater Minnesota; a calculation of unmet needs; an assessment of the level and type of service required to meet unmet needs; an analysis of costs and revenue options; and a plan to reduce unmet transit service needs. The plan is to specifically address special transportation service, ridership, and needs. The objective of the plan is determine the level of funding that will be required to meet at least 80 percent of unmet transit service needs in greater Minnesota by July 1, 2015 and at least 90 percent of unmet transit service needs in greater Minnesota by July 1, 2025. This plan will be completed in 2009.

### **Intercity Bus Study**

In 2009, Mn/DOT will update its Intercity Bus Study, which was last updated in 1997. Intercity bus service in Minnesota is defined as “regularly scheduled bus service for the general public, which operates with limited stops over fixed routes connecting two or more urban areas not in close proximity, which has the capacity for transporting baggage carried by passengers, and which makes meaningful connections with scheduled intercity bus service to more distant points.” The primary objectives of the study include enhanced coordination and connectivity between public and private sector services, the identification of service gaps, strategies to meet service needs, and improved interface between transportation modes. The results of this study, scheduled for completion in mid-2009, will be incorporated in the Statewide Transportation Policy Plan through an amendment likely in 2010.

## **Statewide Freight and Passenger Rail Plan**

The Minnesota Statewide Comprehensive Freight and Passenger Rail Plan, mandated by the 2008 Minnesota Legislature, is scheduled for completion in late 2009. The plan will create a vision for both passenger and freight rail services in Minnesota, establish investment needs, identify a potential passenger system network, determine the role of private and public sector entities, set parameters for corridor priorities, and identify potential funding sources. The plan will comply with expected federal state rail plan guidelines and requirements in order to expedite development and funding for proposed and future projects.

While the passenger rail component of the plan will establish criteria to prioritize potential passenger rail corridors, the freight component of the plan will look at cost, access, and capacity issues that offer opportunities to improve Minnesota's competitiveness and market presence both locally and around the world. A key component of the study will be to integrate the private rail network into the state transportation system, and to effectively complement truck, water, and air freight modes. This plan should allow for short-line railroad vitality, and account for increasing demands on main line capacity by growing "overhead" or long-haul freight rail traffic and new passenger rail development. The results of this plan will be incorporated as a future amendment to this Statewide Transportation Policy Plan.

## **Metro Highway System Investment Study**

Over the next 12 months, Mn/DOT and the Metropolitan Council will work with other transportation partners to evaluate the metropolitan highway system. The study's goal is to define the long-term (40-50 year) vision for the metropolitan area's transportation system. The Metro Highway System Investment Study (MHSIS) will guide overall mobility decisions by giving direction to fully utilize all highway and modal investments in a coordinated manner. The strategies will not be fiscally constrained but the total cost will be considered in "right-sizing" the future transportation system.

This study will address how and where to optimize the use of the system taking into consideration current space and right-of-way constraints. The study will also consider innovative strategies such as dynamic shoulders, managed lanes, and greater integration of transit advantages to improve person throughput on key corridors. This may include the re-examination of previously planned projects as potential areas for strategic capacity investment.

## **Regional Freight Studies**

The Northern Minnesota\Northwest Wisconsin Freight Study and the Western Minnesota Freight Study will be multimodal including highway (commercial vehicle operations), rail, waterway, air cargo, and intermodal transportation. Building on prior planning activities conducted by area partners, the studies will provide a better understanding of the demands freight places on regional transportation infrastructure. Both studies will examine regional and local issues not captured in previous freight transportation studies and plans, document the existing freight transportation systems, identify industry and region-specific issues and trends as

they relate to freight transportation, and plan for improvements for freight movement specific to the regions.

## Long-Range Transportation Funding Options

The 2008 Minnesota Legislature directed that Mn/DOT, in consultation with other state agencies and key stakeholders, evaluate and study:

- (1) How current and long-range needs for preservation and improvement of the state's highways, bridges and transit might be affected by changes in travel behavior and revenue generation due to improved vehicular fuel economy, increased availability of non-driving travel alternatives, and/or sharply increased fuel prices.
- (2) Whether road-use pricing and other alternative transportation system funding mechanisms used in other states and countries show promise for use in Minnesota and for public acceptance and alleviation of congestion; with consideration given also to the effects of such options for air and water quality, reduction of greenhouse gas emissions, and costs of implementation and potential for revenue generation.

Mn/DOT also sponsored a symposium in June of 2009 to address these questions. This symposium was designed to:

- Bring together potential stakeholders.
- Inform stakeholders of current state transportation system performance needs and revenue implications.
- Educate participants about, and build awareness of, various transportation funding options.
- Explore and discuss the potential direct and indirect effects new funding choices could have on Minnesota's environment and the condition of its transportation system.

The study, due in November 2009, will also look into the potential of road pricing and other alternative funding mechanisms with particular consideration of their environmental impacts and implementation feasibility.

## Innovative Finance Initiative

Mn/DOT is working with its transportation partners and stakeholders to explore new innovative finance concepts and options for maximizing limited transportation dollars, better aligning user benefits with costs, and delivering more transportation projects sooner.

Mn/DOT is currently developing goals and a plan for this new innovative finance initiative. The plan will guide the department's exploration and assessment of innovative finance options and best practices, as well as its collaboration and outreach in this area. The plan will also guide the implementation and evaluation of

innovative finance solutions and the integration of successful innovative approaches into the department's planning and project development processes.

## **Americans with Disabilities Act (ADA) Transition Plan**

The Americans with Disabilities Act (ADA) transition plan will identify physical obstacles in Mn/DOT facilities, describe the methods that will be used to make the facilities accessible, specify the schedule for the taking action, and identify the responsible official. This transition plan will also identify a procedure to address complaints/grievances. Ultimately, the ADA transition plan is intended to identify system needs to be addressed through the transportation planning and programming process. Upon completion, the plan will assist Mn/DOT in meeting ADA requirements.

## **Complete Streets Feasibility Study**

Complete Streets are defined as roadways designed and operated to enable safe, attractive, and comfortable access and travel for all users; pedestrians, bicyclists, motorists and public transport users of all ages and abilities. Mn/DOT and its partners are assessing the benefits, costs, and feasibility of establishing a Complete Streets policy in Minnesota. Mn/DOT is hiring a consultant to gather information and feedback about what a Complete Streets policy would mean for Minnesota. The consultant will also research Complete Streets initiatives nationwide. A Complete Streets Study Committee and Technical Advisory Panel have been assembled. The Commissioner will present the final report to the Legislature in December of 2009.

# Appendix A - Plan Acronyms and Definitions

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## Acronyms

AASHTO:	American Association of State Highway and Transportation Officials
ABS:	Anti-Lock Brake System
ADA:	Americans with Disabilities Act
ADT:	Average Daily Traffic
AIP:	Area Improvement Program
APO:	Area Planning Organization
ASC:	Automated Stability Control
ATIP:	Area Transportation Improvement Program
ATP:	Area Transportation Partnership
AUAR:	Alternative Urban Areawide Review
AVL:	Automatic Vehicle Location
AWOS:	Automated Weather Station Systems
BAP:	Bond Accelerated Program
BNSF:	Burlington Northern Santa Fe Railway
BRT:	Bus Rapid Transit
CE/CM:	Cost Estimating/Cost Management
CSS:	Context Sensitive Solutions
CURA:	Center for Urban and Regional Affairs (University of Minnesota)
DEED:	Department of Employment and Economic Development
DEIS:	Draft Environmental Impact Statement
DNR:	Department of Natural Resources
EA:	Environmental Assessment
EAW:	Environmental Assessment Worksheet
EIS:	Environmental Impact Statement
EPA:	Environmental Protection Agency
FAA:	Federal Aviation Administration
FCI:	Facilities Condition Index
FHWA:	Federal Highway Administration
FIRST:	Freeway Incident Response Safety Teams
FMCOG:	Fargo-Moorhead Metropolitan Council of Governments

FRA:	Federal Railroad Administration
GDP:	Gross Domestic Product
GF/EGF MPO:	Grand Forks/East Grand Forks Metropolitan Planning Organization
GHG:	Greenhouse Gas
GPS:	Global Positioning System
HEAT:	Highway Enforcement of Aggressive Traffic
HIP:	Highway Improvement Plan
HOT:	High Occupancy Toll
HOV:	High Occupancy Vehicle
HSIP:	Highway Safety Improvement Program
HSOP:	Highway Systems Operation Plan
HUTD:	Highway User Tax Distribution Fund
ICE:	Intersection Control Evaluation
IRC:	Interregional Corridor
ITS:	Intelligent Transportation System
LAPC:	LaCrosse Area Planning Committee
LCV:	Long Combination Vehicle
LPR:	Legal Permanent Resident
LRP:	Long-Range Plan
LRT:	Light Rail Transit
LRTP:	Long-Range Transportation Plan
MAC:	Metropolitan Airports Commission
MC:	Metropolitan Council
MDSS:	Maintenance Decision Support Systems
MIC:	Metropolitan Interstate Council
Mn/DOT:	Minnesota Department of Transportation
MnWAS:	Minnesota Access System
MPO:	Metropolitan Planning Organization
MRSI:	Minnesota Rail Service Improvement Program
MSP:	Minneapolis-St. Paul International Airport
MVST:	Motor Vehicle Sales Tax
MWRRI:	Midwest Regional Rail Initiative
NAAQS:	National Ambient Air Quality Standard
NBI:	National Bridge Inventory
NEPA:	National Environmental Policy Act

NHS:	National Highway System
NTN:	National Truck Network
NTSB:	National Transportation Safety Board
OFCVO:	Office of Freight and Commercial Vehicle Operations
OIM:	Office of Investment Management
OTST:	Office of Traffic, Safety and Technology
PDSL:	Priced Dynamic Shoulder Lane
PFC:	Passenger Facility Charge
PPP:	Public-Private Partnership
RCIP:	Regional and Community Improvement Priorities
RDC:	Regional Development Commission
ROCOG:	Rochester-Olmstead Council of Governments
RQI:	Ride Quality Index
RSL:	Remaining Service Life
RTAP:	Rural Transit Assistance Program
RTC:	Regional Trade Center
RTMC:	Regional Transportation Management Center
SAFETEA-LU:	Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users
SFY:	State Fiscal Year
SHSP:	Strategic Highway Safety Plan
STIP:	State Transportation Improvement Program
STRAHNET:	Strategic Highway Network
TCMA:	Twin Cities Metropolitan Area
TDM:	Transportation Demand Management
TH:	Trunk Highway
TIP:	Transportation Improvement Program
TMO:	Transportation Management Organization
TOCC:	Transportation Operation and Communication Center
TPIC:	Transportation Program Investment Committee
TTI:	Travel Time Index
TZD:	Toward Zero Deaths
UPA:	Urban Partnership Agreement
USDOT:	United States Department of Transportation
VMT:	Vehicle Miles of Travel
WMS:	Work Management System

## Definitions

**Access Management** – The planning, design, and implementation of land use and transportation strategies in an effort to maintain a safe flow of traffic while accommodating the access needs to adjacent development.

**Area Transportation Partnership** – A committee of elected officials, engineers, planners, and other agency representatives from multiple counties. ATP's were established in Minnesota as a result of the 1991 federal Intermodal Surface Transportation Efficiency Act (ISTEA). The role of the ATP is to prioritize the spending of available federal dollars by developing the Area Transportation Improvement Program (ATIP), which is a four-year list of prioritized projects.

**Arterial** – Roadway functional classification that is given to a facility that primarily focuses on mobility rather than access.

**Automatic Vehicle Location** – Technology that tracks the position of vehicles and relate their location to other physical elements (i.e., map).

**Bare Lane** – When the “tire track” portion of the driving lane is clear of snow and ice.

**Beltway** – High level roadway facility that skirts or circles a regions central city. For the Twin Cities Metropolitan Area, I- 494 and I-694 form the regions beltway.

**Bridge Deck Area** – Surface area of a bridge on which vehicles drive (i.e., travel lanes and shoulders) and/or pedestrians can walk.

**Bulk Commodities** – High volume, low value unprocessed agricultural goods, which are treated as though they are homogeneous (fungible) in nature prior to processing. Grains, oilseeds, and cotton are considered bulk commodities.

**Bus Rapid Transit (BRT)** – BRT usually refers to a high-frequency, high amenity transit service that is operated with buses rather than with light rail vehicles. Typically, BRT buses operate on highways that are designed to give them a time advantage over cars traveling along the same route. This may be accomplished by operating in exclusive lanes or with signal preemption with a limited number of stops.

**Bus-Only Shoulder** – Refers to highway shoulder areas that are reserved for use by buses during peak travel periods. Buses are allowed to use the shoulders when travel speeds are reduced. Maximum speed differential between buses and normal traffic is 15 mph.

**Central Business District** – Refers to a downtown area that is comprised by standard block lengths usually in the range of 300 to 500 feet between public street intersections.

**Central Corridor** – The name given to the future light rail transit (LRT) line that travels between downtown Minneapolis and downtown St. Paul.

**Class I Railroad** – Rail classification given to the largest rail companies that serve national markets (e.g., BNSF, Canadian Pacific, and Union Pacific).

**Class III Short-line Railroad** – Rail classification given to the smaller regional rail companies that serve regional markets.

**Commuter Coach Service** – Express transit service that uses higher amenity buses “coaches.”

**Commuter Rail** – Commuter rail refers to passenger trains that operate on mainline railroad track and carry riders to and from work in city centers.

**Complete Streets** – Complete Streets is a concept or philosophy that promotes greater balance in terms of right-of-way allocated between road users including motorists, commercial vehicles, transit users, bicyclists, and pedestrians.

**Context Sensitive Solutions** – A collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total context within which a transportation improvement project will exist.

**Cost Estimating/Cost Management (CE/CM)** – Mn/DOT initiative that improves Mn/DOT's ability to estimate and manage project costs.

**Crack Sealing** – Maintenance process that fills cracks in the highway pavement surface to prevent infiltration of water.

**Crash Rate** – Statistic that is used to compare highway segments with different volumes. Crashes are normalized to account for different volumes and segment lengths so that comparisons can be made. Typically, rates are shown in crashes per million vehicle miles or crashes per 100 million vehicle miles.

**Deck Flushing** – A preventive maintenance technique to remove chemicals and material build-up through a rapid flow of water.

**Demand-Responsive Service** – A paratransit service in which the passenger either phones or hails the vehicle and shares the vehicle with other passengers (for example, taxi, jitney, or dial-a-ride).

**Design Life** – Length of time over which an infrastructure element is viable before it requires replacement.

**Dial-A-Ride Service** – On-demand transit service.

**Dynamic Shoulder** – A term used for highway shoulders where the shoulders can be dynamically changed from use for emergency stopping to use as a travel lane; this is done to increase capacity of the roadway system as well as reduce congestion-related crashes during peak travel times.

**EA/EAW** – Environmental process which combines both the federal and state environmental process into a single environmental document.

**Edge Line** – Pavement marking that defines the boundary between the edge of the driving lane and roadway shoulder area.

**Edge Treatment** – An improvement applied to the edge of highway pavement at or near its transition to a concrete, bituminous, or gravel shoulder. An example includes edge line rumble strips.

**Enplanements** – Number of passengers originating and connecting at an airport.

**Exclusive Busways** – Roadway facility that is limited for buses only.

**Expressway** – Four lane divided highway facility which typically has higher speeds and traffic volumes, but continues to have at-grade intersections and driveways. Examples of this are State Highway 10 between St. Cloud and Little Falls and TH 169 between Jordan and Mankato.

**Facilities Condition Index (FCI)** – Performance measure used for evaluating the condition of safety highway rest areas.

**Fatality** – A fatality is defined as a death that occurs within 31 days of a crash.

**FIRST Route Coverage** – Highways that are assigned to a particular FIRST unit.

**Fracture Critical** - The term fracture critical indicates that if one main component of a bridge of the fracture critical design were to fail, the entire structure could fail. Fracture critical bridges are not necessarily structurally deficient and the designation of fracture critical does not mean the bridges are inherently unsafe.

**Freeway** – Highway facility that is completely access controlled; access points are provided through controlled access interchanges. Examples of this are I-94 between the Twin Cities and Fargo-Moorhead.

**Freeway Incident Response Safety Teams (FIRST units)** – Roving units that are equipped to assist stranded motorists and/or assist emergency responders with clearing incidents. These units operate on the instrumented portion of the Twin Cities Freeway system.

**Freight Generating Facility** – A facility that generates a significant amount of truck, rail, and/or barge traffic.

**Fuel Purchase Hedging** – Process in which agencies may advance purchase or guarantee the future price of fuel in order to reduce the effect of market volatility.

**Functional Class** – Classification of roadways according to their primary function — these classifications range from principal arterials (greatest mobility) to local streets which provide greatest amounts of access.

**Hardened Shoulders** – Highway shoulders that are strengthened (e.g., pavement is thicker) so that they can accommodate buses and/or traffic.

**Hear Every Voice** – Mn/DOT’s public involvement participation process guidelines, which outline policies, rules, tools, and training resources.

**High-Occupancy Toll (HOT) lanes** – Combines HOV and pricing strategies by allowing single occupancy vehicles to gain access to HOV lanes by paying a toll.

**High-Occupancy Vehicle (HOV) lanes** – Highway lanes reserved for vehicles carrying more than one person. (The specific number of people in the vehicle or class of vehicles who can use this facility is established locally.) These lanes are officially denoted with a diamond marking and are sometimes called “diamond lanes.”

**HSOP** – Refers to the Highway Systems Operations Plan. This plan was developed to baseline operations and maintenance costs for key maintenance areas.

**Hydinfra** – Electronic database inventory of drainage structure information for spans less than 10 feet.

**Incident** – Includes all crashes, rollovers, spinouts and stalled vehicles blocking traffic.

**Incident Clearance Time** – The amount of time between incident detection and total clearance of the incident.

**Indicator** – A set of consistent trend data reported over time that provides information on a changing condition of strategic importance.

**Intelligent Transportation System (ITS)** – The development or application of technology (electronics, communications, or information processing) to improve the efficiency and safety of surface transportation systems.

**Intercity Passenger Rail** – Passenger rail service that connects regional trade centers (e.g., Duluth and Twin Cities).

**Intercity Passenger Service** – Bus and/or rail transportation, operating with limited stops over fixed routes, connecting two or more Regional Trade Centers (levels 1–3). This service has the capacity for transporting passengers and their baggage and making connections with other scheduled, intercity service to points within or outside Minnesota.

**Intermediate Airports** – Airports with paved and lighted primary runways that are less than 5,000 feet long. They can accommodate all single engine aircraft, some multi-engine aircraft and some corporate jets.

**Intermodal** – A concept generally defined as a “seamless” movement of either freight and/or people by more than one mode from point of origin to point of destination.

**Intermodal Freight Transfer Terminal** – A point at which freight is shifted from one mode to another (e.g., rail to truck).

**Interregional Corridor (IRC)** – A system of highways designated by Mn/DOT that connect key regional trade centers throughout the state. This system is comprised of approximately 2,920 miles, two percent of all roadway miles, but accounts for 27 percent of all miles traveled.

**Intersection Control Evaluation (ICE)** – Process in which a range of intersection controls are evaluated and a preferred intersection control is recommended; this process considers among other things operations, safety, and site impacts and costs.

**Key Airport** – Airports with paved and lighted runways 5,000 feet or greater in length. They are able to accommodate single engine and multi-engine aircraft.

**Landing Strip** – Includes turf runways and can accommodate most single engine aircraft and some twin engine aircraft.

**Life-Cycle Costs** – The amortized annual cost of a product or service, including costs associated with capital, installation, operations, maintenance, and disposal, discounted over the lifetime of the product.

**Light Rail Transit (LRT)** – Transit service that runs on a fixed guideway using trains on predominantly reserved, but not necessarily grade-separated, rights-of-way; the service has more stops than commuter rail service.

**Local Road Authorities** – Highway agencies and/or jurisdictions at the county, city and/or township level that administer and maintain roadway facilities within their respective jurisdictions.

**Local Systems Bridges** – Bridges that are maintained by county, cities and/or township jurisdictions.

**Long Combination Vehicle (LCV)** – Vehicles longer than the standard double (tractor plus two 28 foot trailers).

**Maintenance Decision Support Systems (MDSS)** – Interactive system that assists maintenance supervisors with best management practices or techniques given predicted weather forecasts (e.g., timing of event, wind, temperatures, water content, etc).

**Major Collector** – Functional classification given to primarily rural roadways that evenly balance mobility and access functions.

**Managed Corridor** – A managed corridor contains elements of each of three major travel management categories - Transit Advantages, Intelligent Transportation Systems, and Other Management Strategies. The more high-level management elements the corridor contains, the higher managed it is.

**Measure** – A series of numeric values that regularly tracks or predicts progress toward an outcome or objective. An example would be the interregional corridor average travel speed. Mn/DOT will actively manage to achieve targets for measures, unless deemed to be a low priority under budget constraints. Most measures will have a target once adequate baseline data is compiled.

**Mega Bus** – Intercity bus service that travels between major centers with limited stops.

**Metropolitan Highway System** – The system of intended to serve the Twin Cities Metropolitan Region. Only principal arterials, which include interstate freeways, are on the metropolitan highway system. In some places, the plan identifies the metropolitan highway system as the interstate freeways and other principal arterials.

**Metropolitan Planning Organizations (MPO)** – governmental organizations that are required to oversee transportation planning for an urbanized area.

**Metropolitan Urban Freeway System** – System of key freeways in the Twin Cities Metropolitan Area that are instrumented with loop detectors and cameras; this system is more highly managed for incidents and traffic conditions.

**Minimum Speed Targets** – Minimum speeds as established by the Interregional Corridor Study and adopted as part of the Statewide Transportation Plan (Moving Minnesota 2000). Minimum speed targets are 60 mph for High–Priority IRCs and 55 mph for Medium–Priority IRCs.

**Minnesota Rail Service Improvement program (MRSI)** – State program that provides for low or no interest loans for investments to improve or preserve short line and regional rail service, to rehabilitate rail lines, and to provide rail shipper facilities.

**Minor Arterial** – Important highways that provide more mobility than access; they connect major traffic generators or business concentrations within metropolitan areas

and/or provide connections between rural centers and population concentrations in rural areas.

**Mobility** – The ability of a person or people to travel from one place to another.

**Modes** – Different forms of transportation options for moving people (highways, transit, passenger rail, air and bicycles) and freight (highways, rail, air and waterways).

**Multimodal** – Different forms of transportation options for moving people (highways, transit, passenger rail, air and bicycles) and freight (highways, rail, air and waterways).

**Multimodal link** – The connection between two points that can be travel using more than one mode; For example, bicycle and auto, bus and auto, rail and auto.

**National Highway System (NHS)** – is a national designation of approximately 155,000 miles of highway. This network is intended to provide an interconnected system of principal arterial routes serving major population centers, major transportation facilities, major travel destinations, interstate and interregional travel and meeting national defense requirements.

**NHS Intermodal Connector** – Public roads leading to major intermodal terminals such as the Minneapolis-St. Paul International Airport.

**Non-Principal Arterial** – All other highways that are not a principal arterial; these include minor arterials, collector, and local routes.

**Office of Investment Management (OIM)** – Mn/DOT Office that is responsible for statewide transportation planning and investments.

**Operation Lifesaver** – National program to reduce rail grade crossing crashes.

**Opt-Out System** – Six Twin City transit systems that provide service to suburban residents in parts of the Metropolitan Transit Service Area.

**Outcome** – Desired end result for customers or the transportation system.

**Outcome Measures** – Measures of end result for customers, the transportation system, or processes. Examples include bridge structural condition, the number of fatalities, or average travel speed on IRCs.

**Output Measures** – Direct measure of Mn/DOT production activities. Examples include the number of signs replaced annually, the number of high-crash-cost locations improved annually or the number of permits processed. Output measures typically contribute to higher level outcomes.

**Overlay** – Construction method in which a new layer of pavement is placed on top of the current pavement surface.

**Park and Pool** – An arrangement whereby people can drive an automobile to a transit center, transfer station or terminal, park in the designated lot or ramp, and then carpool with another person to a final destination.

**Park and Ride** – An arrangement whereby people can drive an automobile to a transit center, transfer station or terminal, park in the designated lot or ramp, and use a transit vehicle for their ultimate destinations.

**Pavement Condition Index** – A measure used by Mn/DOT to evaluate runway pavement condition. The pavement condition rating is based on the Pavement Condition Index, which is a numerical indicator based on a scale of 0 to 100.

**Pavement Reclamation** – Construction method in which a portion of the existing pavement and/or road surface is milled or ground off and a new wearing surface installed.

**Pavement Reconstruction** – A more extensive construction method in which the current pavement surface is entirely removed and replaced; this is often done with some repair and/or replacement of drainage structures and other roadway infrastructure.

**Pavement Remaining Service Life** – The number of years until a highway pavement reaches a ride rating of 2.0; at this rating the pavement no longer serves a useful life and should be reconstructed.

**Peak-Period Travel Demand** – Volume of traffic that occurs during a three-hour period; one hour on each side of the peak hour.

**Performance-Based Planning** – A planning philosophy or approach whereby investment decisions are guided by performance measures and targets.

**PONTIS** – A federal bridge inventory/inspection program that tracks the conditions of individual bridge elements. It is also used to report the overall condition of bridges.

**Preemption Control** – The interruption of a normal traffic signal cycle to give priority to a particular vehicle movement. Emergency vehicles can preempt or cause signals to change to provide better response times. Transit vehicles can also use preemption to improve transit times. Preemption is also occurs at rail grade crossings to clear the track crossing prior to an approaching train.

**Priced Dynamic Shoulder Lane (PDSL)** – Highway shoulders that can be converted to traffic lanes during peak travel times. In this case, the use of these lanes is priced or tolled depending on vehicle type.

**Primary Collector Route** – A roadway classification that is used by Mn/DOT maintenance to help define its approach for snow and ice removal. These routes carry between 800 and 2000 trips a day.

**Principal Arterial** – A roadway functional classification given to a facility that provides the highest level of mobility. These routes typically connect major population centers and have limited access.

**Queue-Jumping** – Signal priority strategy given to transit to minimize transit delay at an intersection; this strategy by-passes existing traffic or provides a head start for the bus to get in front of other vehicles that are stacked up at an intersection.

**Quiet Zones** – Designation that provides for elimination of train horns; this designation usually requires safety upgrades to current at-grade rail crossings.

**Rail Grade Crossing** – Intersection of a railroad and highway.

**Ramp Meters** – Signals on freeway entrance ramps that regulate and smooth the flow of traffic merging onto the main roadway. Ramp meters improve safety and traffic flow and provide a way to manage bottlenecks or incidents on the main roadway. Many metered ramps have bypasses for buses and carpools.

**Ramp-Meter By-Pass** – Separate lane that allows buses and high-occupancy vehicles to move pass queues at the ramp meters; this is considered a transit advantage.

**Real-Time Traveler Information** – Current travel information that is conveyed directly to motorists that are in transit; this information is most often communicated through dynamic message signs.

**Reasonable Travel Time** – Expected travel time plus acceptable additional travel time. Information on expected travel time and acceptable additional travel time should be obtained from customers and from travel time runs that identify a median travel time.

**Red Rock Corridor** – Future commuter rail corridor that connects Saint Paul with Hastings, Minnesota.

**Regain Time** – Snow and ice performance measurement which measures the time from the end of the storm event till bare pavement is reached.

**Regional and Community Improvement Priorities (RCIP)** – Projects identified by Mn/DOT District transportation partners as priorities not otherwise identified by a performance measures.

**Regional Corridors** – State highways that provide important transportation connections between secondary centers.

**Regional Development Commission (RDC)** – Regional development commissions are multi-county planning and development districts that encourage cooperation between citizens, local government officials, and the private sector. They are often catalysts for strategic planning in rural communities. They help identify local needs and priorities. In addition to planning, regions sponsor many programs, including services for the poor and elderly, job training, small business finance, and minority enterprise programs.

**Regional Fixed-Route Bus Services** – Refers to bus transit services that operate along specific routes with identified bus stops; these routes have a published schedule.

**Regional Trade Center (RTC)** – Economic centers of activity defined as Type 0-3 in the Center for Urban and Regional Affairs' (CURA) report entitled, "Trade Centers of the Upper Midwest, 1999 Update." Major Regional Trade Centers are defined as the Twin Cities Metropolitan Area and the level 1 RTCs. The level 1 RTCs include Duluth-Superior, Fargo-Moorhead, St. Cloud, Rochester and La Crosse-La Crescent.

**Regional Transportation Management Center (RTMC)** – Traffic operations and communications center that monitors key roadways in the Twin Cities Metropolitan Area. This center works in concert with the State Patrol and other emergency services. It also has ability to control ramp meters and dynamic message signs.

**Reliever Airport** – Term given to the six airports operated by the Metropolitan Airports Commission in the Twin Cities that provide relief to MSP (Flying Cloud, Crystal, St. Paul, Anoka County, Lake Elmo, AirLake).

**Remaining Service Life (RSL)** – Each physical roadway asset has a normal expected life span (duration in which it will function). The remaining service life is a measure of time that a particular physical roadway element will continue to fully function.

**Ride Quality Index (RQI)** – Highway pavement ride quality as measured in inches of roughness. The ride measure is based on scale of 0 to 5 with 5 being a brand new pavement. A ride measure of two or less is a pavement that is considered “poor” and is in need of major repairs.

**Ridesharing** – A paratransit service with two or more persons in the vehicle consisting usually a prearranged car pool, van pool or subscription bus.

**Right-of-Way** – A strip of land acquired by purchase, reservation, dedication, prescription or condemnation and intended to be occupied by a roadway, trail, water line, sanitary sewer, and/or other public utilities or facilities.

**Rural Commuter Route** – A roadway classification that is used by Mn/DOT maintenance to help define its approach for snow and ice removal. These routes carry between 10,000 and 30,000 trips a day.

**Secondary Collector Route** – A roadway classification that is used by Mn/DOT maintenance to help define its approach for snow and ice removal. These routes carry fewer than 800 trips a day.

**Secondary Crashes** – Additional crashes that may occur as a result of shockwaves or other traffic maneuvers to avoid initial incident.

**Seven County Metropolitan Area** – The counties of Hennepin, Anoka, Ramsey, Washington, Dakota, Scott and Carver counties comprise the seven-county metropolitan area.

**Short-Line Railroad** – Railroads that serve regional market areas and provide access to the national rail system (e.g. Twin Cities and Western Railroad).

**Strategic Highway Network (STRAHNET)** – Highways that have been designated as part of the national defense highway system.

**Structurally Deficient** – Refers to bridges that have a structural condition rating of 4 or less (deemed to be in poor condition). Structurally deficient means that elements of the bridge need to be more carefully monitored or repaired. The fact that a bridge is deficient, however, does not imply that it is likely to collapse or is unsafe.

**Super Commuter Route** – A roadway classification that is used by Mn/DOT maintenance to help define its approach for snow and ice removal. These routes carry over 30,000 trips a day.

**Target** – A numeric goal for a measure. The level of service (quantity, quality, condition, timeliness, or cost) that Mn/DOT aims to achieve, typically for a specific date or period. For example, 90 percent of IRC miles will achieve target speeds (55 or 60 mph) by 2023.

**Telework** – The elimination or reduction in commuter trips by routinely working part or full-time at home or at a satellite work station closer to home.

**Three-Year Moving Average** – Three-year moving average is defined as the sum of the most recent three years of crash data divided by three. The average is computed each year with the newest year added to the computation and the last year (4th year) dropping out of the computation. Data is assembled annually.

**Throughput** – A performance measure that tracks the number of vehicles or people that can pass a point on a roadway or pass through a point over a specified period of time. Person throughput includes passengers of vehicles while vehicle throughput only includes vehicles.

**Tier 1 Bridge** – Any bridge that has average daily traffic volume (ADT) greater than 1,000 and has a sufficiency rating at or below 50, or is identified by the commissioner as a priority bridge.

**Tier 2 Bridge** – Any bridge that is not a Tier 1 bridge and is classified as fracture critical, or has a sufficiency rating of 80 or below.

**Transit** – Schedule and demand responsive regular and express bus services; intercity bus service, light rail transit, commuter rail and Amtrak passenger services.

**Transit Advantages** – Facility improvements that offer travel-time benefits and connections to multi-occupant vehicle services such as bus lanes, ramp meter bypasses, HOV lanes, transit stations and major park-and-ride lots.

**Transit Centers** – Locations where timed-transfer connections between transit vehicles is facilitated. Transit centers are usually at shopping centers or other high-pedestrian locations.

**Transit Choice Users** – Users of the transit system that are not dependent upon the system for their basic transportation needs; they choose to use the system.

**Transit Dependent Population** – The transit dependent population includes youth, elderly, low income, zero-car households, and persons with mobility limitation. Youth includes 18 years of age and under; elderly consists of individuals 55 years and older; and low income comprises individuals with income up to 200 percent of the poverty level.

**Transitways** – Travel corridors dedicated exclusively to bus-only shoulders, high-occupancy vehicle (HOV) lanes, busways, LRT or commuter rail.

**Transportation Demand Management (TDM)** – Programs and methods to reduce effective demand. In the broadest sense, any activity or facility that reduces vehicle trips would fall within this classification. The highest priority in the region is given to reducing single-occupant vehicle trips in the peak periods. Techniques that might be utilized are car pooling, van pooling, transit, alternative work hours, transportation management associations, and land development or ordinances that discourage vehicle trips and encourage walking, bicycling, ridesharing and transit trips.

**Transportation Improvement Program (TIP)** – A four-year multimodal program of highway, transit, bicycling, walking and transportation enhancement projects and programs proposed for federal funding.

**Transportation Infrastructure** – The guideways and/or associated terminals used for moving people and freight for all modes. Guideways include – highways (Interstates, US Highways, Trunk Highways and other roadways); rail lines; and waterways (rivers, lakes and associated water bodies). Terminals include: park-and-ride facilities; transit station/hubs; intermodal facilities; airports; and river terminals, lake ports and seaports. The transportation infrastructure provides the essential links to economic activity.

**Transportation Management Organization (TMO) or Association (TMA)** – Nonprofit employer associations, sometimes involving public entities, usually formed in highly congested areas to deal with common transportation concerns, particularly alleviating congestion.

**Transportation Program Investment Committee (TPIC)** – The TPIC is a standing committee whose membership consists of senior Mn/DOT management. The committee's function is to guide overall transportation decision making for Mn/DOT.

**Transportation Services** – Customer-oriented element of transportation modes (e.g., vehicle, passenger and freight-carrying capacity, frequency of service, traveler information, etc.).

**Travel-Demand Management** – Strategies to manage demand on roadways designed to redirect trips to higher-occupancy modes or away from peak-traffic periods so that the total number of vehicles trips are reduced. Can include both capital and service improvements to highways and transit, and may involve community action.

**Travel Time Index** – A ratio of travel time in the peak period to travel time during periods where there is free flow.

**Travel Time Reliability** – Measurement of the predictability or variability of travel times.

**Truck Priority** – Signal operations strategy to reduce the number of stops for trucks at rural high-speed signalized intersections. This strategy improves both operational efficiency and intersection safety for all vehicles.

**Truck Staging** – Temporary parking of trucks on edge of Twin Cities Metropolitan Area as a way to reduce flow of trucks during peak travel periods.

**Unit Train Terminal** – Grain terminals that can accommodate a full train at a single time (minimum of 100 cars). These terminals also usually have quick loading facilities to meet requirements for train turnaround times.

**Urban Commuter Route** – A roadway classification that is used by Mn/DOT maintenance to help define its approach for snow and ice removal. These routes carry between 2,000 and 10,000 trips a day.

**Urban Fringe** – Term used to describe the edge of developing area.

**Urban Partnership Agreement (UPA)** – a competitive program sponsored by the USDOT that is focused on new innovative ways to reduce congestion in large metropolitan areas. Solutions must include tolling, transit, technology and telecommuting. Mn/DOT, in partnership with numerous other agencies, submitted a successful proposal for significant improvements to I-35W and Cedar Avenue corridors for significant transit improvements.

**Urbanizing Area** – An area that is developing to an urban density on urban services.

**Weather Event** – Time from the beginning of snowfall until three hours after snowfall has ended.

**Yellow Tags** – Process in which Mn/DOT attempts to recover financial costs of an incident that damages public property. For example, if a vehicle loses control and knocks down a light pole, the replacement cost of the pole can be recovered from the driver or his insurance company.

# Appendix B - Acknowledgements

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## Steering Committee Participants

The Statewide Plan Steering Committee played a central role in the development of the Statewide Transportation Policy Plan. The Steering Committee included Mn/DOT's central and district leadership, directors of Mn/DOT specialty offices and representatives of key external stakeholders, including state and federal agencies, Metropolitan Planning Organizations, cities, and counties. The Steering Committee met regularly throughout the plan development process to review progress, consider the broader vision, and advise on general policy direction. Members of the Steering Committee are listed below.

### *Mn/DOT Division Directors*

Tim Henkel, Modal Planning and Program Management Division (Chair)

Bob Winter, Operations Division (Vice-Chair)

Bernie Arseneau, Policy, Safety and Strategic Initiatives

Pam Tschida, Employee and Corporate Services

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### *Other Mn/DOT Participants*

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Keith Shannon, Materials

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Jim Japs, Department of Natural Resources  
Todd Biewen, Pollution Control Agency  
Joe Martin, Department of Agriculture  
Terry Kuhlman, Department of Employment and Economic Development  
Suzie Palmer, Department of Public Safety  
Arlene McCarthy, Metropolitan Council  
Amy Vennewitz, Metropolitan Council  
Ron Chicka, Greater Minnesota Metropolitan Planning Organization Representative  
Anne Finn, League of MN Cities  
Jim Mulder, Association of Minnesota Counties

**Mn/DOT Contributors**

Several Mn/DOT employees and management groups contributed to the overall planning process and assisted in guiding the work of the Steering Committee. Mn/DOT planning staff provided day-to-day oversight and guidance of the plan's development. Additional Mn/DOT staff and management groups helped define and develop the plan's ten policy areas by examining trend data and developing proposed policy directions, performance measures, and strategies. These contributors are listed below.

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Paul Czech, Metro District

*Additional Mn/DOT Staff*

Numerous Mn/DOT employees made invaluable contributions to the plan by serving as experts to their respective modal and functional areas.

**Greater Minnesota MPO Directors**

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Earl Haugen, Grand Forks-East grand Forks Metropolitan Planning Organization  
Phil Wheeler, Rochester-Olmstead Council of Governments  
Ron Chicka, Duluth Superior Metropolitan Interstate Council  
Scott Mareck, St. Cloud Area Planning Organization  
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# Appendix C - Stakeholder Consultation, the Public Involvement Process Framework, and Environmental Justice

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The development process for the Minnesota Statewide Transportation Policy Plan 2009-2028 was guided by state and federal regulations and statutes addressing various requirements for public and stakeholder involvement. For example, current federal surface transportation authorization legislation identifies stakeholder groups that must have the opportunity to participate in the planning process. The purpose of this appendix is to highlight the state and federal requirements relevant to this planning process, describe how stakeholders and general public alike were informed and consulted, and the methods by which input was gathered from them. Additionally, Environmental Justice (EJ) is presented in the context of Mn/DOT's public involvement practices.

## Meeting State and Federal Requirements

Federal regulations direct Mn/DOT to develop a multimodal statewide transportation plan that identifies transportation system goals, needs, and priorities over a 20-year period. Minnesota Statute requires that the plan be updated every six years.

Any statewide transportation plan must comply with legislation establishing the federal transportation program currently known as the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The plan must be developed consistent with content and process provisions outlined in that legislation. An example of one such provision is that statewide transportation plans be developed in consultation with Tribal Governments. Furthermore, the planning process must consider statewide trade and economic development planning activities as well as any relevant multi-state planning efforts. The plan must also be coordinated with metropolitan area long-range transportation plans.

In updating the Minnesota's statewide transportation plan, Mn/DOT's specific public involvement approach has adhered to the following federal requirements (23 CFR 450.210):

- Establish early and continuous public involvement opportunities that provide timely information about transportation issues and decision making processes to citizens, affected public agencies, representatives of public transportation employees, freight shippers, private providers of transportation, representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, providers of freight transportation services, and other interested parties;
- Provide reasonable public access to technical and policy information used in the development of the long-range statewide transportation plan and the State Transportation Improvement Program (STIP);

- Provide adequate public notice of public involvement activities and time for public review and comment at key decision points, including but not limited to a reasonable opportunity to comment on the proposed long-range statewide transportation plan and STIP;
- To the maximum extent practicable, ensure that public meetings are held at convenient and accessible locations and times;
- To the maximum extent practicable, use visualization techniques to describe the proposed long-range statewide transportation plan and supporting studies;
- To the maximum extent practicable, make public information available in electronically accessible format and means, such as the World Wide Web, as appropriate to afford reasonable opportunity for consideration of public information;
- Demonstrate explicit consideration and response to public input during the development of the long-range statewide transportation plan and STIP;
- Include a process for seeking out and considering the needs of those traditionally underserved by existing transportation systems, such as low-income and minority households, who may face challenges accessing employment and other services; and
- Provide for the periodic review of the effectiveness of the public involvement process to ensure that the process provides full and open access to all interested parties and revise the process, as appropriate.
- In addition to federally required public involvement practices, Chapter 174 of Minnesota Statute requires that a public hearing be held to solicit and receive public comment on a draft of the Statewide Transportation Policy Plan.

## Public Involvement Process Framework

The public involvement component of the update of the Minnesota Statewide Transportation Policy Plan followed guidance provided through *Hear Every Voice* – Mn/DOT’s published public and stakeholder participation policy. *Hear Every Voice* establishes a framework for effective stakeholder consultation and public involvement processes for project and plan development. *Hear Every Voice* also provides guidance on stakeholder identification, level of consultation and involvement, tribal consultation and offers techniques for public participation. This guide was updated in 2007 to incorporate the previously listed public involvement requirements from SAFETEA-LU.

At the beginning of the planning process, the planning team established the following public involvement goals:

- Create opportunities for public involvement, focusing on specific stakeholder groups including citizens, affected public agencies, non-metropolitan local officials, tribal agencies, and those traditionally underserved by existing transportation systems.
- Use the public involvement strategies outlined in *Hear Every Voice* to identify opportunities within the state and to guide the development of Mn/DOT’s vision for the statewide transportation system.
- Integrate and coordinate public involvement with technical tasks and timelines.
- Ensure compliance with federal public involvement requirements.

## Internal and External Outreach

The public involvement process for this plan utilized outreach efforts that were both internal to Mn/DOT's organizational structure as well as external. In many instances, the components of internal outreach efforts were also components of external efforts.

For example, the Steering Committee is considered both internal and external outreach because its membership consisted of both Mn/DOT and non-Mn/DOT representatives. The framework was adjusted as necessary to accommodate schedule and/or other unforeseen disruptions.

Initial outreach process planning allowed for formation and/or utilization of several internal and external "groups" all of which played a critical role in the planning process. These entities are briefly described below.

### Transportation Program Investment Committee (TPIC)

The TPIC is a standing committee whose membership consists of senior Mn/DOT management. The committee's function is to guide overall transportation decision making for Mn/DOT. It is a standing committee and had final approval of the project management team and the decision making structure for the Statewide Transportation Policy Plan. The TPIC was updated on the Statewide Transportation Policy Plan and the Statewide Highway Investment Plan at critical points in the planning process. In June of 2009, the TPIC recommended that the plan be approved by the Transportation Commissioner.

### Steering Committee

The development of the Statewide Transportation Policy Plan was led by a Statewide Plan Steering Committee with primary support provided by Mn/DOT's Office of Investment Management (OIM) and technical support provided by subject specific technical working groups. The Steering Committee included Mn/DOT's central office and district leadership, directors of Mn/DOT specialty offices and representatives of key external stakeholders, including state and federal agencies, Metropolitan Planning Organizations, cities, and counties. The steering committee's membership consisted of representatives from:

Mn/DOT Division Directors	Federal Highway Administration
Mn/DOT District Engineers	MN Dept. of Commerce
Mn/DOT Office of Investment Management	MN Dept. of Natural Resources
Mn/DOT Office of Aeronautics	MN Pollution Control Agency
Mn/DOT Office of Transit	MN Dept. of Agriculture
Mn/DOT Office of Freight & Vehicle Operations	MN Dept. of Employment and Economic Development
Mn/DOT Tribal Liaison	MN Dept. of Public Safety
League of Minnesota Cities	Metropolitan Council
Association of Minnesota Counties	Greater Minnesota Planning Organizations

The Steering Committee met ten times throughout the plan development process to develop a broader vision, establish policy direction, and review progress. Committee members examined trends and issues, reviewed technical workgroup recommendations, and considered stakeholder feedback.

### **Project Management Team**

The project management team provided the overall management of the planning process and guided the work of the steering committee. The project management team was made up of Mn/DOT planning staff and provided day-to-day oversight and guidance of the plan's development.

### **Technical Work Groups**

Technical work groups defined and developed the ten policy areas which combine to form plan's policy framework. To do so, they examined trend data and developed proposed policy directions, performance measures, and strategies. These work groups were guided by the steering committee and the project management team. They were comprised of both Mn/DOT technical staff and external partners such as the Federal Highway Administration and the Metropolitan Planning Organization (MPO) Executive Directors from throughout the state.

Stakeholder outreach (Figure C.1) was conducted in three rounds. The characteristics of these three rounds are described below.



### Round One of Outreach (Spring 2007)

Minnesota Statewide Transportation Policy Plan outreach efforts commenced in the spring of 2007. During this time-frame, technical work groups were formed, district and stakeholder outreach meetings were conducted, a project website was created, and a steering committee was assembled and convened for the first time.

### District/Area Transportation Partnership Outreach

The initial round of outreach meetings was held in each of the eight Mn/DOT Districts during March and April of 2007. This was the first of three rounds. During these meetings, regional and local transportation stakeholders were given the opportunity to identify and discuss the transportation issues they felt were important to their region and the state. Their input aided in the construction of the policy structure of the plan.

Though the meetings were open to the public, the target audience was members of each district's Area Transportation Partnership (ATP). An ATP is a committee of elected officials, engineers, planners, tribal government representatives and other agency representatives from multiple counties. The primary role of the ATP is to prioritize the spending of available federal dollars by developing the Area Transportation Improvement Program (ATIP), which is a four-year list of prioritized projects. As representatives of local interests in transportation programming process, the ATP members provide expertise in local transportation needs and emerging issues. In addition to the ATP members, Mn/DOT Districts invited other transportation stakeholders from throughout their regions.

### Steering Committee Meetings

The Steering Committee met for the first time on June 20, 2007. At this meeting, members reviewed the input received during the first round of outreach meetings, discussed the plan approach, themes and policy framework, and reviewed the committee's purpose and charge.

### Statewide Transportation Plan Website

A website dedicated to the statewide transportation plan was created and maintained throughout the planning process. The website made available the work of the Statewide Transportation Plan Steering Committee including meeting agendas, presentations, and committee meeting minutes/summary. Additionally, all information presented at outreach meetings along with summaries of feedback received was posted on line for broader review and comment. Visitors of the site were encouraged to provide input on Minnesota's transportation issues.

Figure C.1 Stakeholder Outreach Policy Plan: 2009-2028

Source: Mn/DOT Office of Investment Management

### **Targeted Outreach to Transportation Stakeholders**

In addition to the District/ATP outreach meetings around the state, targeted meetings were held with several transportation stakeholder groups in a concerted effort to hear from a wide range of viewpoints. The planning team presented information and gathered input from the following groups during the first round of outreach included:

- Minnesota Freight Advisory Committee
- Minnesota Township Association
- Advisory Committee for Tribal Transportation
- MPO Directors
- Transit stakeholders
- State Bicycle and Pedestrian Advisory Committee
- Minnesota Chapter of the American Planning Association
- Minnesota Joint City/County Engineers Executive Committee
- Legislative Staff
- Duluth-Superior Metropolitan Interstate Council
- Sugar Beet Industry-Transportation Executive Committee

### **Round Two Outreach (Summer/Winter 2008)**

Round two outreach spanned from the summer 2008 to early 2009. During this timeframe a second series of District/ATP outreach meetings were held and a draft of the plan was prepared. This phase of the public involvement process gave additional opportunities for two-way dialogue between Mn/DOT and stakeholders.

### **District/Area Transportation Partnership Outreach**

A second series of District/ATP outreach meetings were held in the summer of 2008. The general make-up and procedure of the meetings was similar to the first in that each district/ATP hosted one meeting and ATP members were targeted for participation. The meetings were also open to the public.

The purpose of the meeting was to brief transportation stakeholders on the status of plan's update and seek additional feedback on the proposed direction of the plan. Many significant events had affected perspectives on transportation needs and priorities in Minnesota since initial outreach meetings in 2007. These events included the tragic collapse of the I-35W Bridge, the findings and recommendations of the Legislative Auditor and the new funding and investment direction set forth by the legislature in HF2800.

Mn/DOT staff provided an overview of the key policy areas, strategies and investment priorities under consideration given the state's socio-economic trends, transportation system conditions, and revenue and cost projections. Statewide and district level information was presented.

### **Steering Committee Meetings**

The steering committee met eight times in 2008. The purpose of the first six meetings was to consider the policy areas identified by the technical working groups. One or more of the 10 policy areas became the focus of each meeting. In July, following the second round of outreach meetings, the committee convened to, among other tasks, review the comments and themes from those meetings. The eighth and final steering committee meeting of 2008 took place in November. At this meeting committee members were asked to review a draft of the plan's executive summary and the policy chapter.

### **Targeted Outreach to Transportation Stakeholders**

In addition to the District/ATP outreach meetings around the state, targeted meetings were held with several transportation stakeholder groups in a concerted effort to hear from a wide range of viewpoints.

Organizations targeted during the second round of outreach included:

- Minnesota Township Association
- Advisory Committee for Tribal Transportation
- Minnesota Freight Advisory Committee
- MPO Directors
- Minnesota Transportation Alliance

### **Statewide Transportation Plan Website**

The plan website was continuously updated with progress of the Statewide Transportation Policy Plan Steering Committee including agendas, presentations, and summaries. Additionally, the schedule of the second round of District/ATP outreach meetings was posted on the site.

As the second round of outreach transitioned into the third and final round, a draft of the plan was posted to the website. The website was the primary avenue to submit comments during the formal public comment period. The formal public comment period is discussed in greater detail in the Round Three Outreach section of this appendix.

### **Media Relations**

Mn/DOT's Office of Communications prepared and distributed press releases for all outreach meetings. Mn/DOT District Planning Directors worked with their Public Affairs Coordinators to ensure press releases were available to local media outlets.

### **Round Three Outreach (Winter/Spring 2009)**

Round three outreach took place during the winter and spring of 2009. During this round a third series of outreach meetings were held, two public hearings were conducted, and the formal public comment period took place. This round officially began in January following publication and posting to the website the Draft Statewide Transportation Policy Plan. This round of outreach was critical in soliciting public comment on the plan.

### **District/ATP/Public Outreach**

In February and March of 2009 final outreach meetings were held in the form of open houses, one in each of the eight Mn/DOT Districts. The purpose of the meetings was to present the Draft Minnesota Statewide Transportation Policy Plan 2009-2028 to the public and to solicit comments. For this series of meetings the targeted participant list was expanded considerably in an effort to solicit comment or feedback. The groups and populations specifically targeted are discussed in greater detail in the Media Relations section below.

During these open house meetings a brief presentation was made by senior Mn/DOT staff, followed by an opportunity to ask questions and submit comments verbally or on comment cards. Twenty five poster boards summarizing the draft plan were on display at the meetings. These poster boards included summary information on system condition and trends, both statewide and at the district level, and each of the ten draft policies and proposed investments, again both statewide and at the district level. District management and planners made themselves available to discuss issues and strategies with participants. More than 300 people participated statewide.

### **Targeted Outreach to Transportation Stakeholders**

In addition to the District/ATP/Public outreach meetings around the state, targeted meetings were held with several transportation stakeholder groups in a concerted effort to discuss the content of the draft plan. During the third round, the planning team met with the following groups:

- MPO Staff
- Representatives of public interest groups; Fresh Energy, Transit for Livable Communities, and Growth and Justice

### **Steering Committee Meetings**

The Steering Committee met for the final time on June 4, 2009 to review comments received during the public comment period, proposed responses to comments, and the proposed changes to be made to the draft plan.

### **Statewide Transportation Policy Plan Website**

In January 2009, a draft of the Minnesota Statewide Transportation Policy Plan was posted to the website. This action served as commencement of the formal public comment period which took place between January 20 and March 30, 2009. The documents were posted as PDF documents and word documents to increase accessibility. Additionally, documents were available in alternate formats upon request.

The website served as the primary means by which the public gathered information on how to participate in the formal comment period. Visitors to the site found information on the many avenues through which they could submit comments on the draft plan. Methods included:

- An online comment tool designed specifically for this plan
- A dedicated plan comment telephone line/number
- Email
- US Mail
- Fax

During the public comment period a schedule of the District/ATP/Public outreach meetings and public hearings was posted to the website. This information was regularly updated as scheduling adjustments were made. A link to these schedules was also placed on the Mn/DOT homepage.

### **Media Relations**

The media played a critical role in disseminating information during the final phase of outreach.

On January 16, 2009, Mn/DOT issued a press release informing the public of upcoming public outreach meetings, the scheduled statewide public hearing, and instructions for accessing and commenting on the draft plan. There was a statewide press release issued by Mn/DOT's communications office. Each district also distributed a press release to local media outlets, highlighting the time and location of the open house meeting in their area.

A second press release was issued statewide on March 13, 2009 informing the public of the opportunity to provide official comment on the plan by attending one of the public hearings scheduled in March 2009.

### **Targeted Outreach to the Traditionally Underserved**

Notice of the public outreach meetings was distributed to a comprehensive email list of transportation users ranging from the disabled community to environmental groups. Contacts were culled from a number of sources including, but not limited to, Mn/DOT's Office of Communications, Mn/DOT District Planning Directors and Public Affairs Coordinators, Mn/DOT's Office of Transit, and the Metropolitan Council. Special attention was given to representatives of traditionally underserved communities. Notice of the open house meetings and the public hearing, instructions on how to access and comment on the draft plan along with the draft executive summary for the Statewide Transportation Policy Plan were sent via US Mail to the following organizations and advocacy groups:

- American Association of Retired Persons
- Active Living Ramsey County
- Chicano Latino Affairs Council
- Confederation of Somali Communities in Minnesota
- Council on Asian Pacific Minnesotans
- Hispanic Chamber of Commerce
- Hmong Cultural Center
- Minnesota American Indian Chamber of Commerce
- Minnesota Black Chamber of Commerce
- Minnesota Hmong Chamber of Commerce
- Minnesota Senior Federation
- Minnesota Coalition for the Homeless

The same information was sent to organizations and boards representing Minnesota's disabled community. These included:

- Access Press
- ADA Minnesota Department of Transportation
- ARC Greater Twin Cities
- Met Council Transportation Accessibility Advisory Committee
- Metropolitan Center for Independent Living
- Minnesota Statewide Independent Living Council
- Minnesota Consortium for Citizens with Disabilities
- Minnesota State Services for the Blind
- Minnesota Council on Disability
- National Federation of the Blind of Minnesota

### **Public Hearings**

Two formal public hearings were held in March of 2009 to gather testimony on the draft plan. These hearings were conducted via video conference allowing for receipt of testimony from remote locations throughout the state. Notice of the hearing was initially published in the February 9, 2009 edition of the State Register (Volume 33, Number 32).

Twenty-two individuals, 11 stakeholder groups and 4 government agencies either provided testimony at the public hearings or submitted written comment. The hearings were held from 5:00-6:00 pm on March 25th, and from 9:00-Noon on March 26th, 2009. The evening public hearing was scheduled to encourage participation by those who work a traditional work day or are otherwise unable to attend during standard business hours. Mn/DOT held the public hearing meetings via video conference in an effort to maximize opportunity for public input on the plan and minimize travel time associated with the decision to attend.

The March 25th hearing was linked via videoconference to eight Mn/DOT District and Central Office locations. The March 26th hearing was linked via videoconference to 16 Mn/DOT District and Central Office locations throughout the state. Materials including hard copies of the draft plan were available for the public's use at the hearing locations.

Options for language translation were offered and an American Sign Language (ASL) interpreter was present at both hearings. All comments received during the public hearing became part of the official public hearing record and were considered during final preparation of the plan.

### **Response to Comments Received**

Many groups and individuals submitted comments on the same basic issues or themes. In order to respond to comments and develop recommended revisions to the draft plan, the planning team grouped the comments by theme and then developed a response.

A summary of all comments received during the public comment period and the associated response has been posted to the Statewide Transportation Policy Plan website in conjunction with final approval of the plan. The comments are arranged by topic with responses varying depending on the type of comment.

Some comments were general or simply expressed concurrence support for with some aspect of the plan and required no response. Some comments were recommendations or questions that are already addressed in the plan and the response simply identifies the chapter or policy that addressed the concern.

For those comments recommending additions or revisions to the plan, the proposed response either supports the recommendation and indicates how the plan will be modified, or explains why the recommendation is not supported.

While many of the comments focused on a detailed issue such as a specific performance measure, trend, or desired highway improvement project, there were also comments relating to major policy directions contained in the plan including:

- Support for Multimodal Approach
- Future Plans & Studies
- Highway System Investment Priorities
- Investment Plans for Other Modes
- Investment Plan for Highway Operations

Also in conjunction with final approval, a summary of all major additions, revisions, and clarifications made to the plan was posted to the website. In combination, these two documents highlight the high degree to which the public's comment influenced the final plan.

## **Environmental Justice**

Presidential Executive Order 12898, issued in 1994, directed every federal agency or one using federal funds to make environmental justice part of its mission by identifying and addressing the effects of all programs, policies, and activities on minority populations and low-income populations.

Based on the USDOT Order on Environmental Justice there are three fundamental principles of environmental justice, as cited in *An Overview of Transportation and Environmental Justice*, USDOT:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

Title VI of the Civil Rights Act prohibits discrimination on the basis of color, race or national origin. Environmental Justice Executive Order continues to protect these groups but expands its umbrella to include low-income populations.

In 1998, Mn/DOT's Committee on Environmental Justice developed a draft guidance to implement environmental justice. It provides a summary of the US DOT Order on Environmental Justice, which translates the Environmental Justice Executive Order into key points and guidance for state DOTs. The guidance also highlights Mn/DOT's environmental justice principles and implementation guidelines, with directions for planning and project development. Mn/DOT's Environmental Justice Draft Guidance, has been incorporated into Mn/DOT's public involvement document "Hear Every Voice".

## Minority and Low-Income Populations

To assess the impacts of Mn/DOT policies on the minority and the low-income populations, the existence of a population needs to be identified. The United States Department of Transportation order on Environmental Justice defines a population as:

"... any readily identifiable group of minority persons or low-income persons who live in geographic proximity; or geographically dispersed persons, such as migrant workers or Native Americans who will be similarly affected by a proposed DOT program, policy or activity."

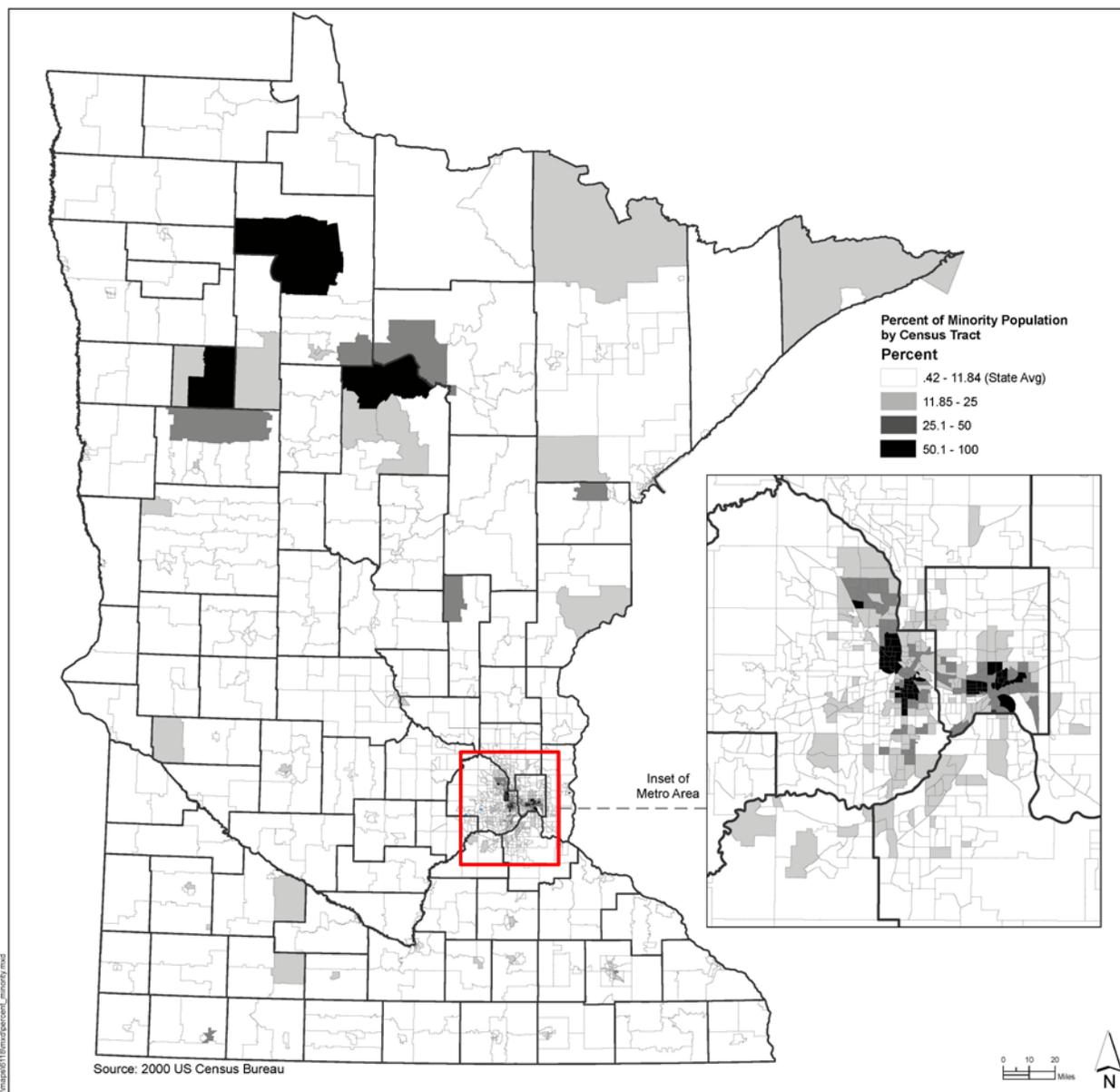
The 2000 Census tract level data, the most recent data available, was used to map the two environmental justice populations. Two methods of mapping were used to understand the location and concentration of the populations: the number of persons per square mile and the percent of the population. Using both maps together gives a better understanding of the concentration and location of the environmental populations in Minnesota. There are many areas in Minnesota that have a high percent of environmental justice populations, but due to the sparse population in the area, do not show up as having high numbers of environmental justice persons per square mile. Similarly, there are areas with large numbers of environmental justice persons, but as a percent of the total population they are a small number due to the high population density in the area. For statewide policy analysis, the percent of environmental justice population is the most appropriate measure to use because it allows us to compare the relative impacts of the policies on the environmental justice population.

Figures C.2 and C.3 show the minority and low-income populations as a percent of the total Minnesota population per tract. The state average is used as the baseline.

## Minority Populations

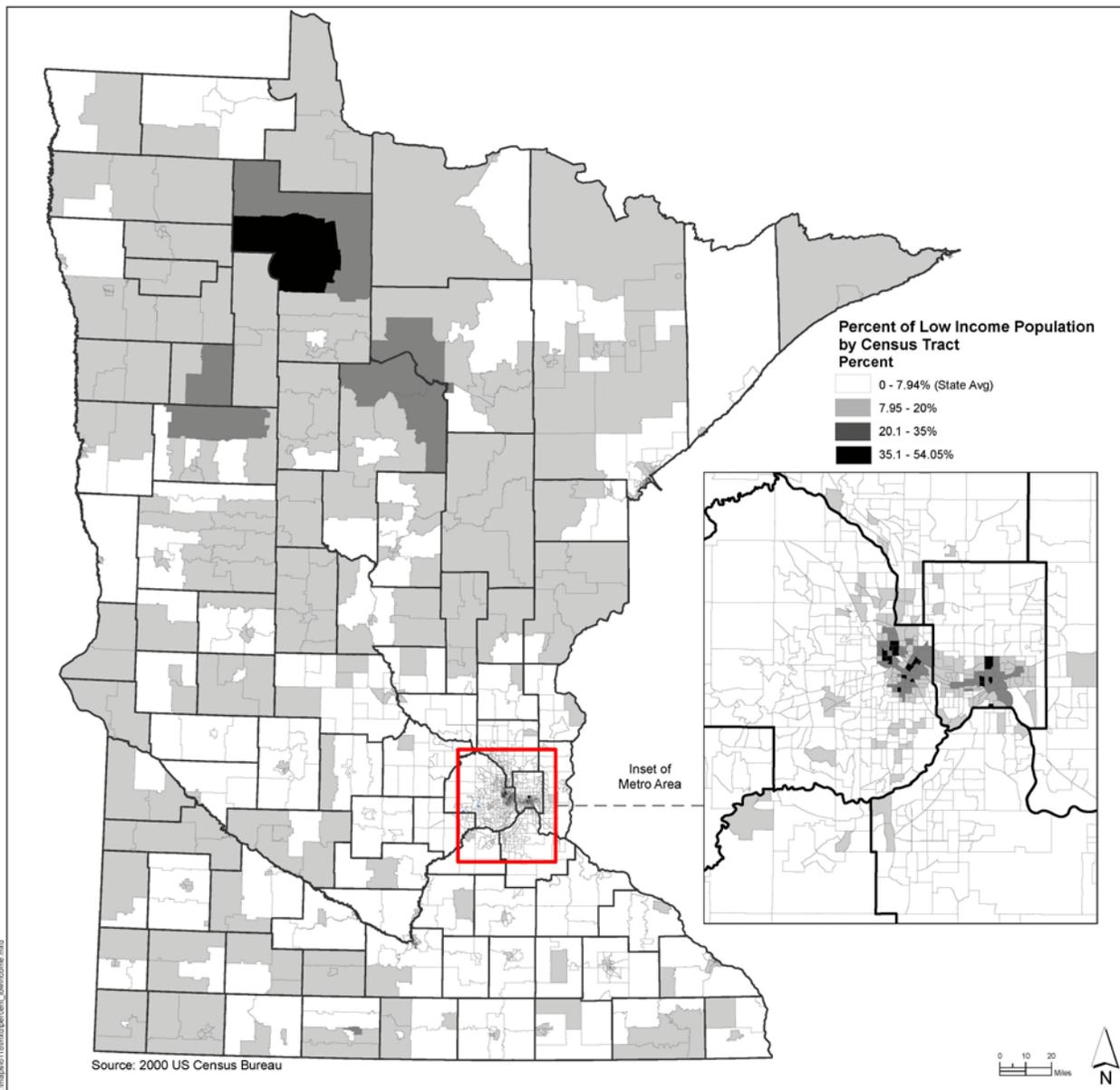
The 2000 census data shows that:

- Minority population was 11.8 percent of the total population in Minnesota;
- In the Twin Cities Metropolitan Area, the percent of minority population was 16.8 percent;
- Out of the total minority population in Minnesota 76.3 percent lived in the Twin Cities Metropolitan Area;
- People of African, Asian and Hispanic descent alone reside mostly in the Twin Cities Metropolitan Area, 90, 84, and 60 percent respectively;
- The majority of the American Indian population (64 percent) lives outside the Twin Cities Metropolitan Area. Many live on reservations and other historically American Indian areas in northern Minnesota (Duluth, Bemidji and Cloquet). In 2000, there were 16,927 American Indians living on the reservations.



**Figure C.2 Minority Populations in Minnesota**

Source: 2000 Census Data



**Figure C.3 Low-Income Populations in Minnesota**

Source: 2000 Census Data

### Low-Income Populations

Using the ‘persons in poverty’ as a measure for low-income populations, the 2000 Census shows that:

- 7.9 percent of the population were low-income in 1999;
- In the Twin Cities Metropolitan Area, the poverty rate was 6.9 percent compared to 9.1 percent for Greater Minnesota;
- More than half the people in poverty live outside the seven county metro area, 53 percent; and

- Minneapolis and Saint Paul have some of the highest rates of poverty in the state, 16.9 percent and 15.6 percent, respectively.

## Public Involvement and Environmental Justice Populations

Mn/DOT is committed to involving members of the public throughout the state in the development and implementation of its plans and programs. According to Mn/DOT's public involvement policy, *Hear Every Voice*, and to productively work with the people of Minnesota, it is essential that Mn/DOT's stakeholder consultation and public involvement processes are:

- Appropriate
- Accessible
- Transparent
- Accountable
- Meaningful
- Inclusive of the state's diverse population

With regard to planning, Mn/DOT's *Hear Every Voice* policy guidance states that public and stakeholder participation, including participation from Minnesota's diverse populations and stakeholders "encourages the development of a joint vision for transportation shared by stakeholders, the public, and Mn/DOT." It also encourages stakeholder understanding of Mn/DOT's planning process and the status of the state's transportation system and resources.

*Hear Every Voice* states that every major planning effort should do the following:

- Establish early and continuous stakeholder consultation and public involvement opportunities,
- Provide timely information about transportation issues and decision-making processes to stakeholders,
- Provide the appropriate level of stakeholder involvement in the planning process.

As noted in *Hear Every Voice*, SAFETEA-LU identifies a Spectrum of Participation Levels for communication and participation, which consists of:

1. Inform – to provide objective, balanced information to assist the public in understanding issues, planning, and program efforts.
2. Consider – to take into account opinions, actions, or information from others.
3. Consult – to confer periodically and consider each other's views prior to acting and report actions afterward.
4. Cooperate – work together to achieve a common goal or purpose.
5. Coordinate – compare plans, programs, and schedules, and adjust them for general consistency.



# Appendix D - Performance Measures and Indicators

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This Statewide Transportation Policy Plan provides Minnesotans with a picture of how well their transportation system is working and the direction in which the system is headed over the plan's 20-year life. Two key elements in developing this picture are performance measures and performance indicators. Both are included in this appendix and an understanding of how the two differ is useful when reviewing this document.

## Performance Measures and Performance Indicators

When tracked over time, both performance measures and performance indicators provide quantitative information to transportation authorities and decision makers.

Performance measures are those that Mn/DOT has significant influence over and which are actively managed to improve results through investment and operational decisions, strategies, innovations, and partnerships. Mn/DOT has established performance targets for many of these measures to drive improvement and to quantify investment needs. An example of a measure over which Mn/DOT has influence and for which a target has been established is the structural condition of state highway bridges.

Performance indicators help describe how well the overall transportation system is functioning without regard to Mn/DOT's role in managing these variables. Examples include carbon dioxide emissions from the transportation sector and the number of destinations served by non-stop flights from the Minnesota.

When viewed collectively, these measures and indicators provide a more comprehensive view of the health of Minnesota's transportation system.

Each of the 10 major policy areas of the plan present a list of measures and indicators associated with that it. Most policy areas also provide trend data for a selected number of those measures and/or indicators to provide context. The purpose of this appendix is to provide a complete description of all measures and indicators associated with this plan.

The measures and indicators are organized in this appendix by policy area. In addition to a brief description of each measure or indicator, information on associated targets, purpose, relevance, data source, office with reporting responsibility, methodology, and trends are outlined.

Some measures and indicators are listed as developmental. Those with this descriptor have been deemed to be important but the data source and/or methodology for data collection have not been fully developed. In developing measures, a general criteria is that it be actively tracked and incorporated into one of any number of periodical reports produced by the department or by one of its partners.

The remainder of this appendix outlines the measures and indicators as described above.

# Policy 1: Traveler Safety

Reduce the number of fatalities and serious injuries for all travel modes

## 1.1 Fatalities on All Roads

**Measure:** Annual vehicle-related fatalities on all state and local roads.

**Target:** Reduce fatalities to fewer than 500 in 2008 and fewer than 400 by 2010.

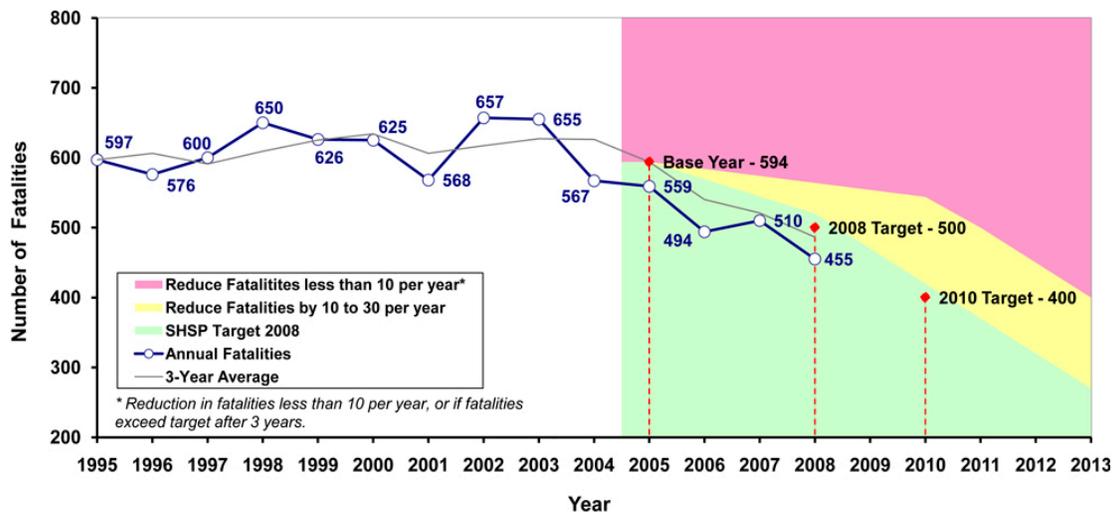
**Relevance/Purpose:** In 2001, Mn/DOT partnered with local road authorities, law enforcement, community leaders, and public health professionals in a shared initiative known as Toward Zero Deaths (TZD). Based on this initiative, Mn/DOT established the number of traffic-related fatalities as the key statewide safety performance measure. The mission of TZD is “To move Minnesota toward zero deaths on our roads, using Education, Enforcement, Engineering, and Emergency Services.”

**Source:** Minnesota Department of Public Safety (DPS)

**Reporting Office:** Mn/DOT Office of Traffic Safety and Technology

**Methodology:** Accident reports are required for all crashes that occur or originate on a public traffic way and that involve injury or total property damage of greater than \$1,000. State and local law enforcement professionals file reports with the Department of Public Safety Office of Driver and Vehicle Services. The Minnesota Department of Public Safety, Office of Traffic Safety, compiles this data and publishes the annual summary report Minnesota Motor Vehicle Crash Facts.

**Trends through 2008:** The annual number of fatalities on Minnesota roadways trended upward between 1995 and 2003. However, since 2003 significant progress has been made in reducing total fatalities from a high of 657, down to 455 in 2008. The following figure shows the fatality trend and target for all state and local roadways in Minnesota.



## 1.2 Severe or Incapacitating Injuries on All Roads

**Measure:** Annual number of severe or incapacitating injuries on all Minnesota roads.

**Target:** While no target is currently in place, one is likely to be established during the life of this 20-year plan.

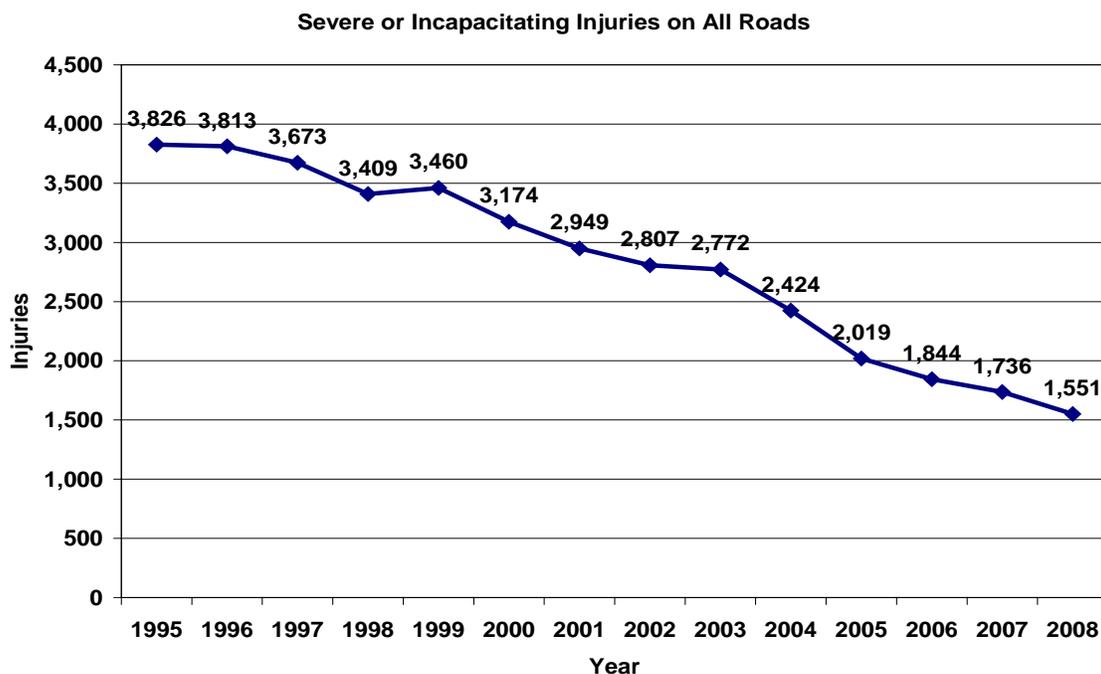
**Relevance/Purpose:** While the primary focus of the Toward Zero Deaths (TZF) initiative is reducing fatalities, severe injury crashes continue to be of great concern. This measure tracks the annual total number of severe or incapacitating injuries on all state and local roads.

**Source:** Minnesota Department of Public Safety (DPS)

**Reporting Office:** Mn/DOT Office of Traffic Safety and Technology

**Methodology:** Data will be drawn from the Department of Public Safety Office of Traffic Safety's crash data. A severe or incapacitating injury, classified as a Type "A" injury in crash reports, is defined as an injury (other than fatal) that prevents the injured person from walking, driving, or normally continuing the activities he or she was capable of performing before the injury occurred. Severe and incapacitating injuries include lacerations, broken or distorted limbs, skull fracture, crushed chest, internal injuries, unconsciousness, etc. Hospitalization is usually required. Mn/DOT and its TZD partners will monitor and report this information annually.

**Trends through 2008:** The annual number of severe or incapacitating injuries on all Minnesota roads has decreased virtually every year for more than a decade.



### 1.3 Share of Fatal and Severe or Incapacitating Injuries on Urban and Rural Roads

**Indicator:** Annual number of fatal and severe or incapacitating injuries on all urban and rural Minnesota roads.

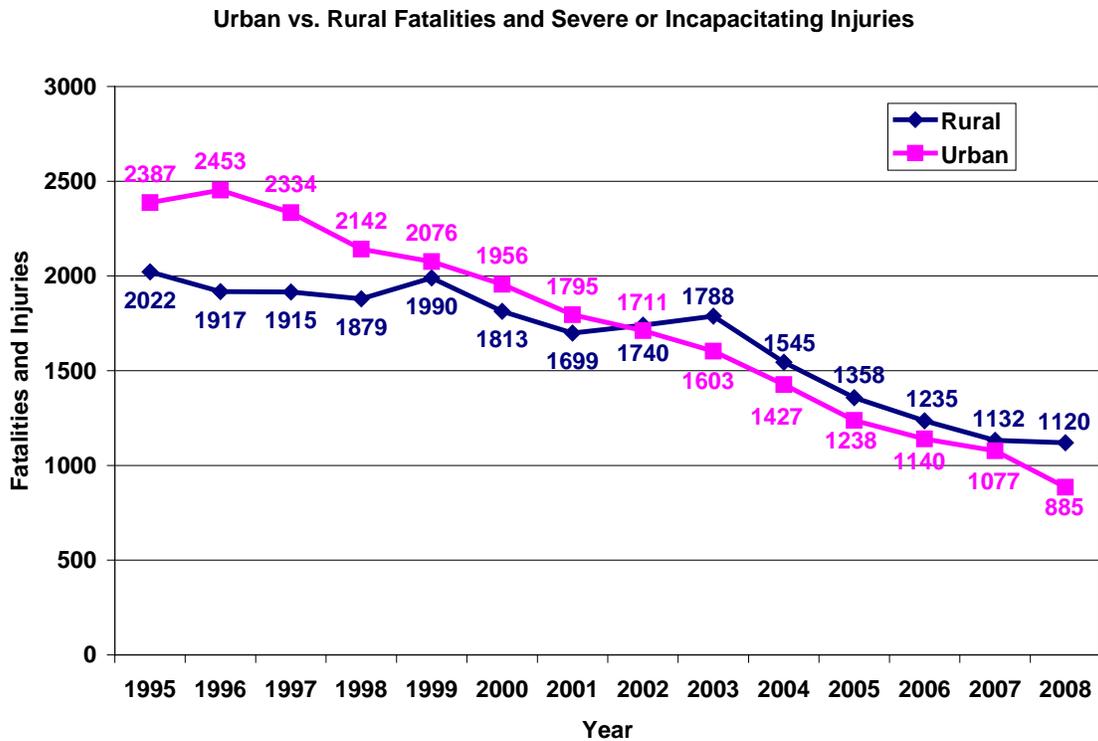
**Relevance/Purpose:** One of the key principles of Mn/DOT’s Strategic Highway Safety Plan (SHSP) is that strategies for improving safety be data driven. A more complete understanding of trends by type of vehicle (motorcycle, heavy commercial, bicycle and pedestrian, rail/car) and by geographic descriptor (urban or rural) will allow agencies to target their efforts and resources more effectively.

**Source:** Minnesota Department of Public Safety

**Reporting Office:** Mn/DOT Office of Traffic Safety and Technology

**Methodology:** Data will be provided by the DPS Office of Traffic Safety. An urban area is defined as any population center with greater than 5,000 residents.

**Trends through 2008:**



## 1.4 Motorcycle-Related Fatalities and Severe or Incapacitating Injuries on all Roads

**Measure:** Annual number of motorcycle-related fatal and severe or incapacitating injuries on all Minnesota roads.

**Target:** There is no target associated with this measure.

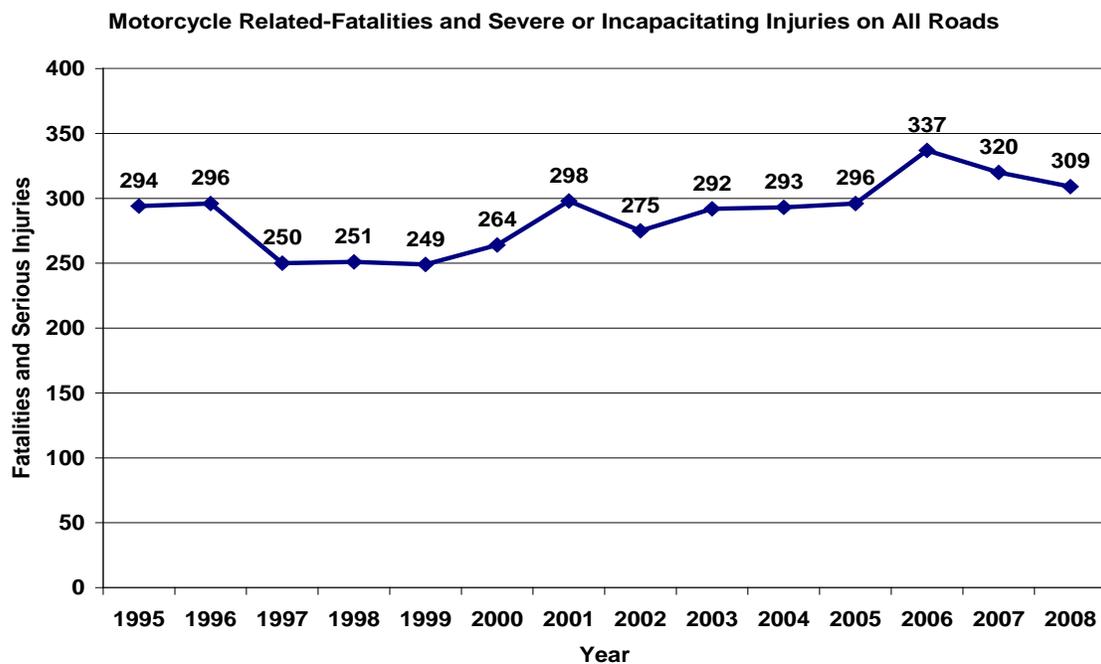
**Relevance/Purpose:** One of the key principles of Mn/DOT's Strategic Highway Safety Plan (SHSP) is that strategies for improving safety be data driven. A more complete understanding of trends by type of vehicle (motorcycle, heavy commercial, bike and pedestrian, rail/car) will allow agencies to target their efforts and resources more effectively.

**Source:** Minnesota Department of Public Safety

**Reporting Office:** Mn/DOT Office of Traffic Safety and Technology

**Methodology:** Data will be provided by the DPS Office of Traffic Safety. The data includes crashes where the injured party was driving or riding on a motorcycle.

### Trends through 2008:



### 1.5 Heavy Commercial Vehicle-Related Fatalities and Severe or Incapacitating Injuries on All Roads

**Indicator:** Annual number of heavy commercial vehicle-related fatal and severe or incapacitating injuries on all Minnesota roads.

**Target:** There is no target associated with this measure.

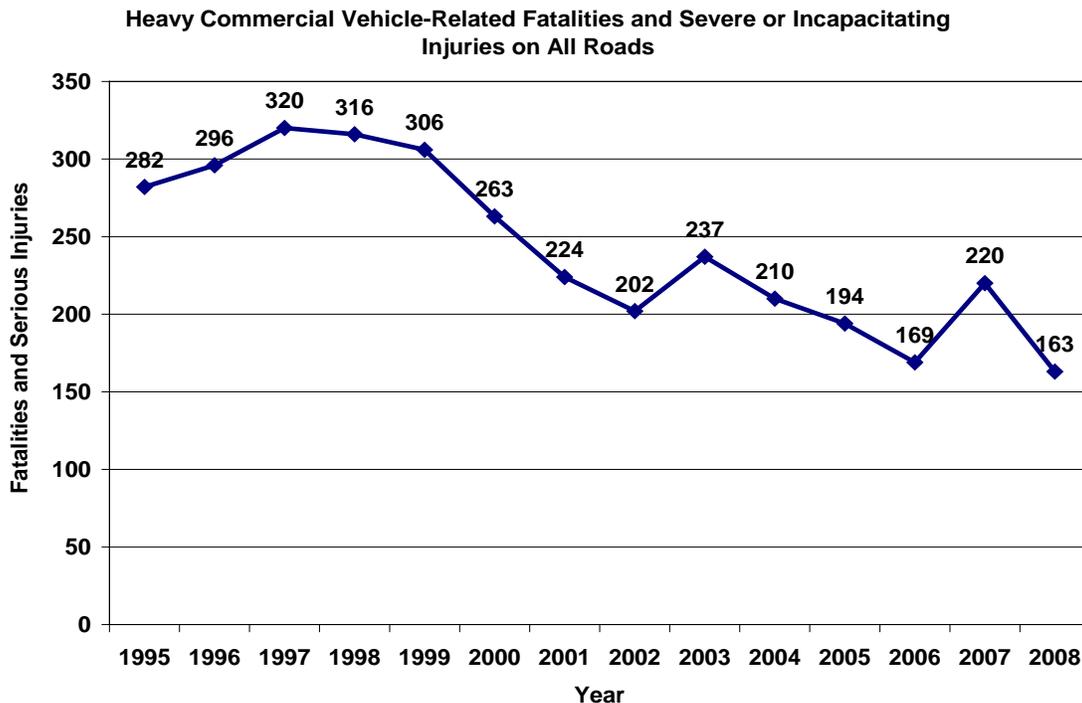
**Relevance/Purpose:** A key principle of Mn/DOT’s Strategic Highway Safety Plan (SHSP) is that strategies for improving safety be data driven. A more complete understanding of trends by type of vehicle (heavy commercial, bike and pedestrian, rail/car) will allow agencies to target their efforts and resources more effectively.

**Source:** Minnesota Department of Public Safety (DPS)/Mn/DOT Office of Traffic Safety and Technology (OTST)

**Reporting Office:** Mn/DOT Office of Freight and Commercial Vehicle Operations

**Methodology:** DPS compiles statewide vehicle fatality, injury and crash data. OTST works with DPS to provide the relevant data subset to the reporting office. The data includes crashes in which at least one of the vehicles involved is a heavy commercial vehicle. A heavy commercial vehicle is defined as a vehicle with six or more tires used for the transportation of goods. Minnesota categorizes vehicles as “heavy” if the Gross Vehicle Weight Rating is 26,000 pounds and higher.

**Trends through 2008:**



## 1.6 Bicycle and Pedestrian-Related Fatalities and Injuries

**Indicator:** Annual bicycle- and pedestrian-related fatalities and injuries.

**Relevance/Purpose:** A key principle of Mn/DOT's Strategic Highway Safety Plan (SHSP) is that strategies for improving safety be data driven. A more complete understanding of trends by type of vehicle (heavy commercial, bike and pedestrian, rail/car) will allow agencies to target their efforts and resources more effectively. These indicators also provide information useful in responding to the goals of Toward Zero Deaths strategy.

**Source:** Minnesota Department of Health (MDH) Minnesota Injury Data Access System (MIDAS) Report

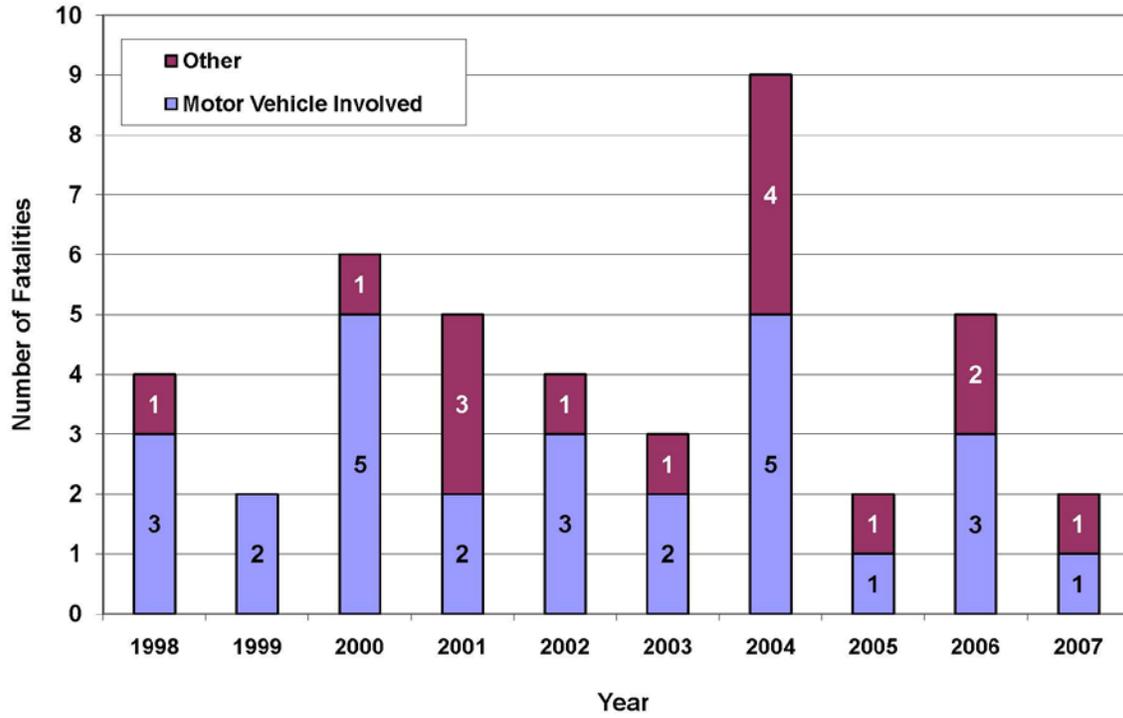
**Reporting Office:** Mn/DOT Office of Transit

**Methodology:** The Minnesota Department of Health receives reports from the Minnesota Hospital Association which use hospital discharge data to identify bicycle and pedestrian injuries that are presented for hospital treatment. MDH data represents approximately 95 percent of all patient discharge data for injuries in Minnesota.

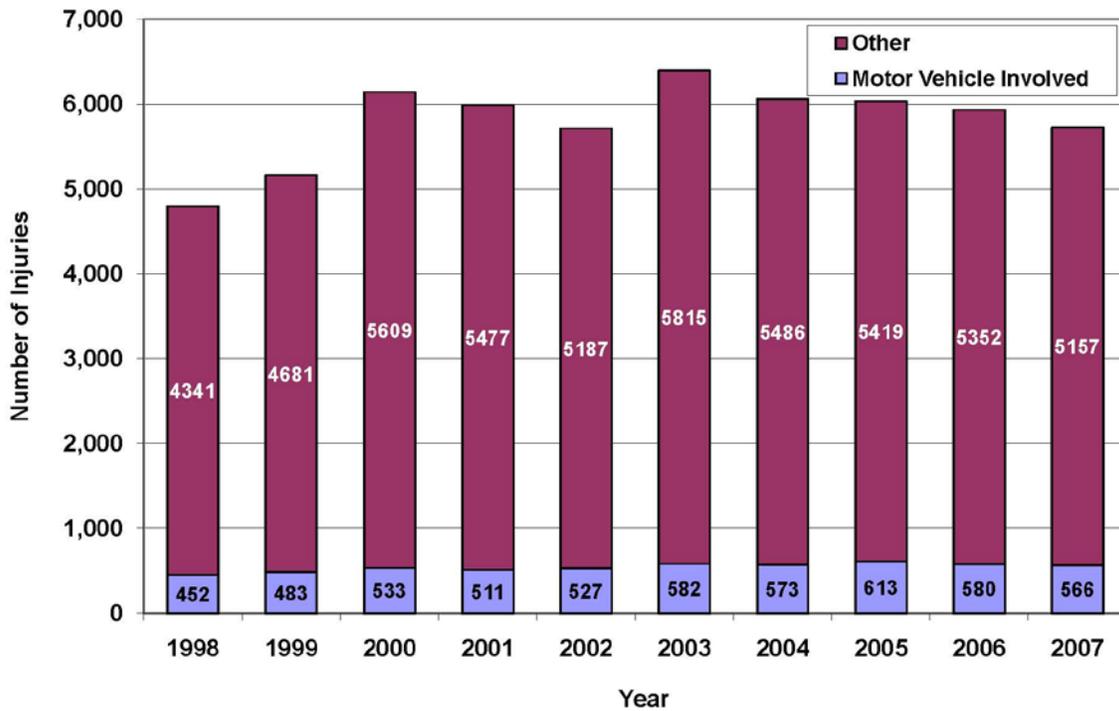
Many of the traffic related measures presented in this plan utilize Minnesota Department of Public Safety (DPS) data. Bicycle and pedestrian crashes that do not involve a motor vehicle, however, are not represented in DPS injury and fatality data. As a result, DPS bicycle and pedestrian data typically do not accurately represent the number and percentage of bicyclists and pedestrians who are injured while biking or walking.

**Trends through 2007:**

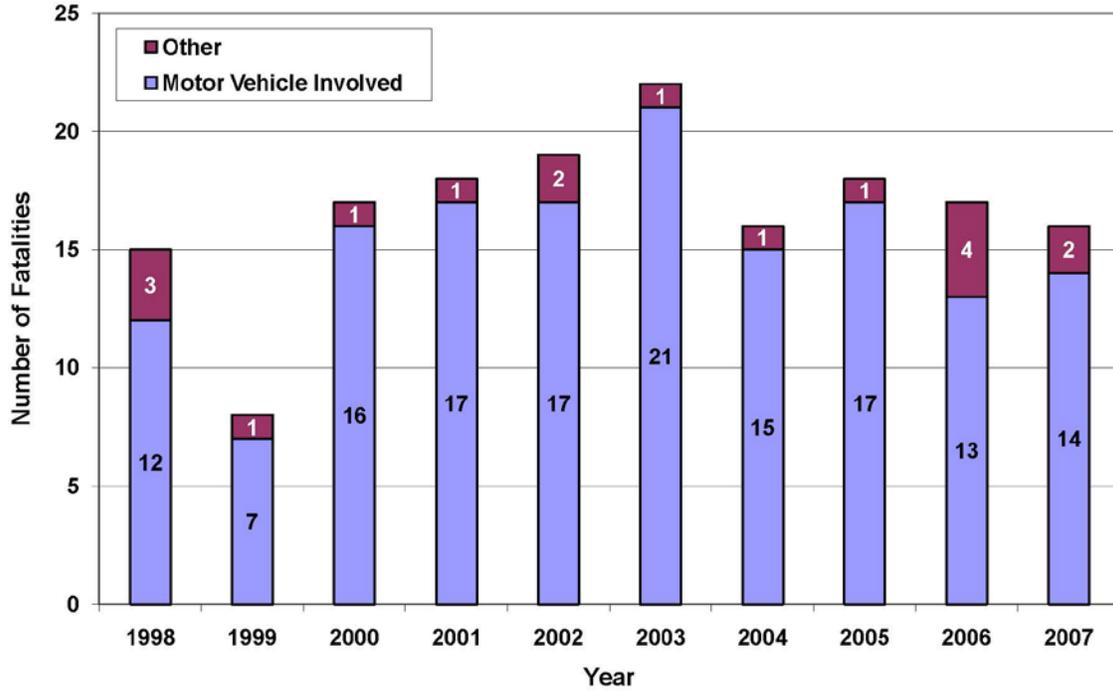
Bicycle-Related Fatalities



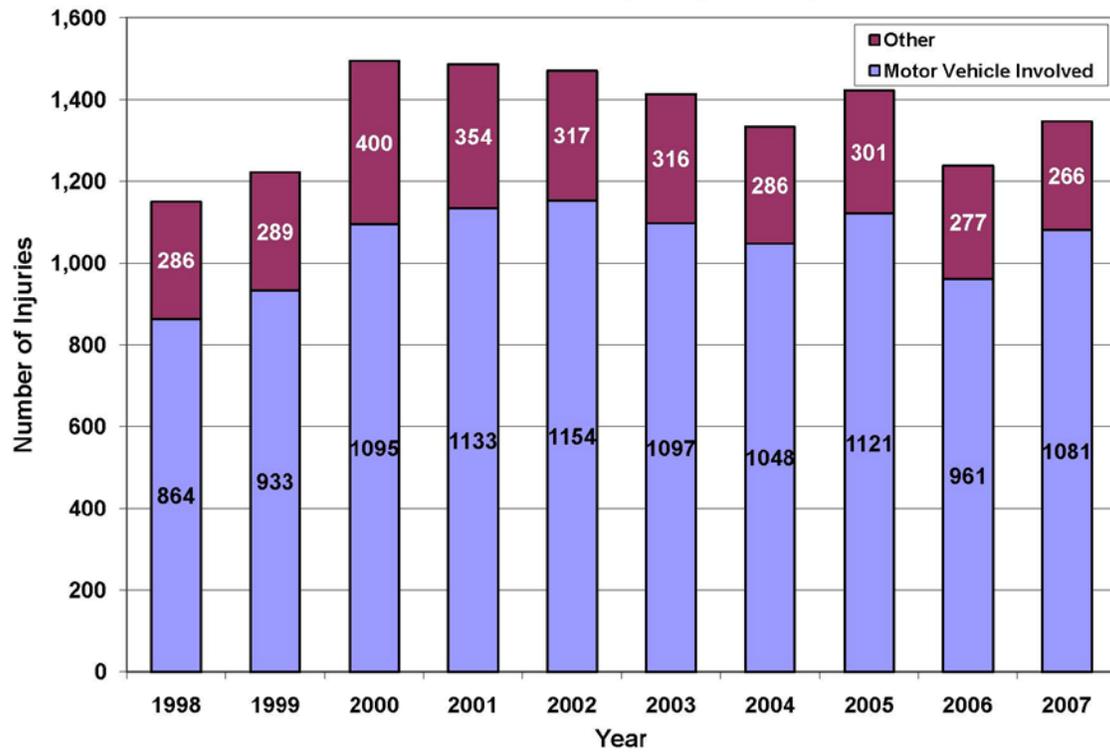
Bicycle-Related Injuries (Non-fatal)



Pedestrian-Related Fatalities



Pedestrian-Related Injuries (Non-fatal)



### 1.7 Railroad Crossing-Related Fatalities and Crashes on All Roads

**Measure:** Annual number of rail crossing-related fatal crashes and total number of crashes on all Minnesota roads.

**Target:** Reduce the number of crashes at highway – railroad grade crossings by 9 percent per year over the next 20 years and maintain the recent trend of fewer than 10 fatal crashes at highway – railroad grade crossings per year.

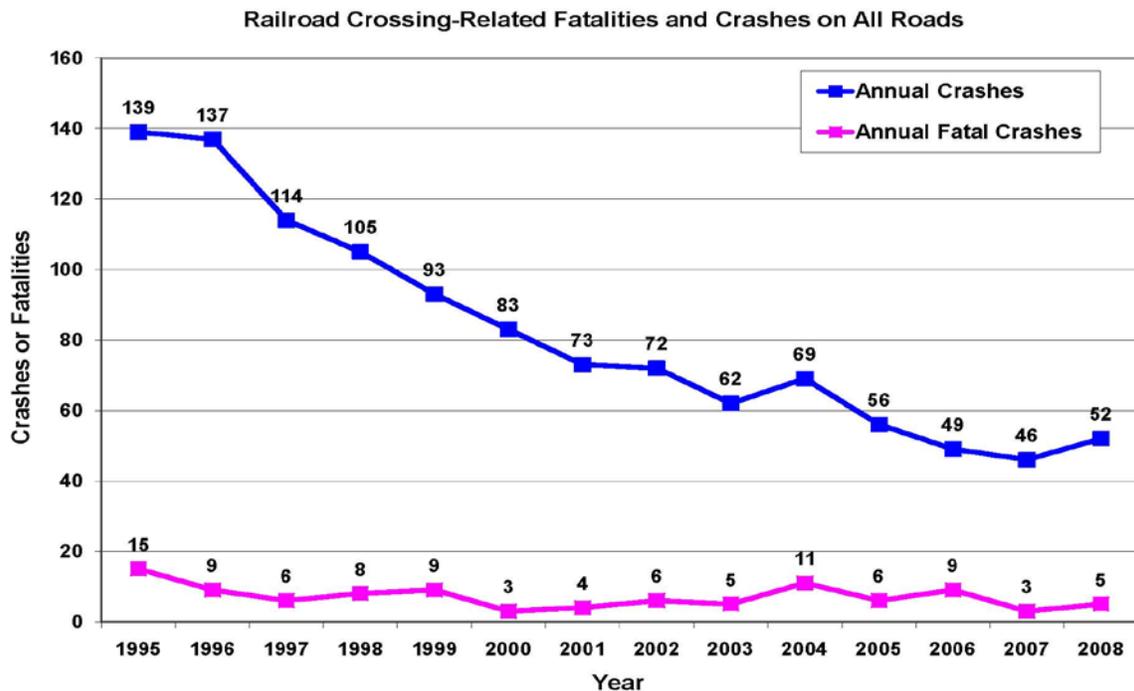
**Relevance/Purpose:** A key principle of Mn/DOT’s Strategic Highway Safety Plan (SHSP) is that strategies for improving safety be data driven. A more complete understanding of trends by type of vehicle (heavy commercial, bike and pedestrian, rail/car) will allow agencies to target their efforts and resources more effectively.

**Source:** Minnesota Railroads Reporting to Mn/DOT Office of Freight and Commercial Vehicle Operations

**Reporting Office:** Mn/DOT Office of Freight and Commercial Vehicle Operations

**Methodology:** Mn/DOT’s Office of Freight and Commercial Vehicle Operations compiles annual crash railroad crossing crash data as reported by all Minnesota railroads.

**Trends through 2008:** The annual number of crashes (and associated 3-year average) has shown an overall decreasing trend since 1995. In 2007, Mn/DOT Office of Freight and Commercial Vehicle Operations recorded the lowest ever number of crashes at 46 and the fewest fatal crashes at 3. This reflects the continuing effectiveness of the rail grade crossing safety improvement program and the efforts of the rail community.



## 1.8 Dollars Spent on Highway Safety Improvement Program (HSIP) Stand Alone Safety Projects

**Measure:** Dollars spent on HSIP stand alone safety projects.

**Target:** \$19,500,000 per year

**Relevance/Purpose:** This is a composite statewide input indicator of the new level of investment of Mn/DOT and local governments in proactive cost-effective safety enhancements promoted in Policy 1 of the Statewide Transportation Policy Plan through the dedicated Highway Safety Improvement Program fund process. Examples of HSIP eligible projects include rumble stripes, lighting, and cable median barriers among others. It does not reflect the total investment of all agencies in these strategies. Research indicates that these strategies are likely to improve results for Minnesota's chief outcome measures which aim to reduce fatalities and serious injuries.

**Source:** Minnesota Department of Public Safety & Mn/DOT's Office of Traffic, Safety and Technology (OTST)

**Reporting Office:** Mn/DOT's Office of Traffic, Safety and Technology (OTST)

**Methodology:** The Strategic Highway Safety Plan (SHSP) identifies critical emphasis areas, strategies and countermeasures to reduce fatal and serious injury crashes. The SHSP provides detailed guidance for each Area Transportation Partnership (ATP) on implementing these strategies and countermeasures. OTST has developed a process to solicit projects that meet the intent of the SHSP and then to distribute HSIP funds to the selected projects.

**Trends:** The annual statewide funding level for local projects in Minnesota is \$12.5 million. As of June 1, 2009, Mn/DOT had fully funded the local HSIP program in 2009 and funded all but \$250,000 for 2010. The remaining \$250,000 will be carried over to 2011 or set aside for proactive projects to be identified in the ongoing safety plan. The annual statewide funding level for state projects is \$6.9 million. For 2009 and 2010, the state has funded \$13.4 million and \$13.2 million respectively. Mn/DOT exceeded the HSIP goal for state projects because some districts chose to fund above and beyond their target in safety projects.

## 1.9 Transit Incidents in the Twin Cities Metropolitan Area

**Indicator:** Annual Number of Transit Incidents Occurring on Metro Transit's System.

**Relevance/Purpose:** The safety of transit users is an important component to establishing a reliable and robust transit system.

**Source:** Metro Transit and the National Transit Database

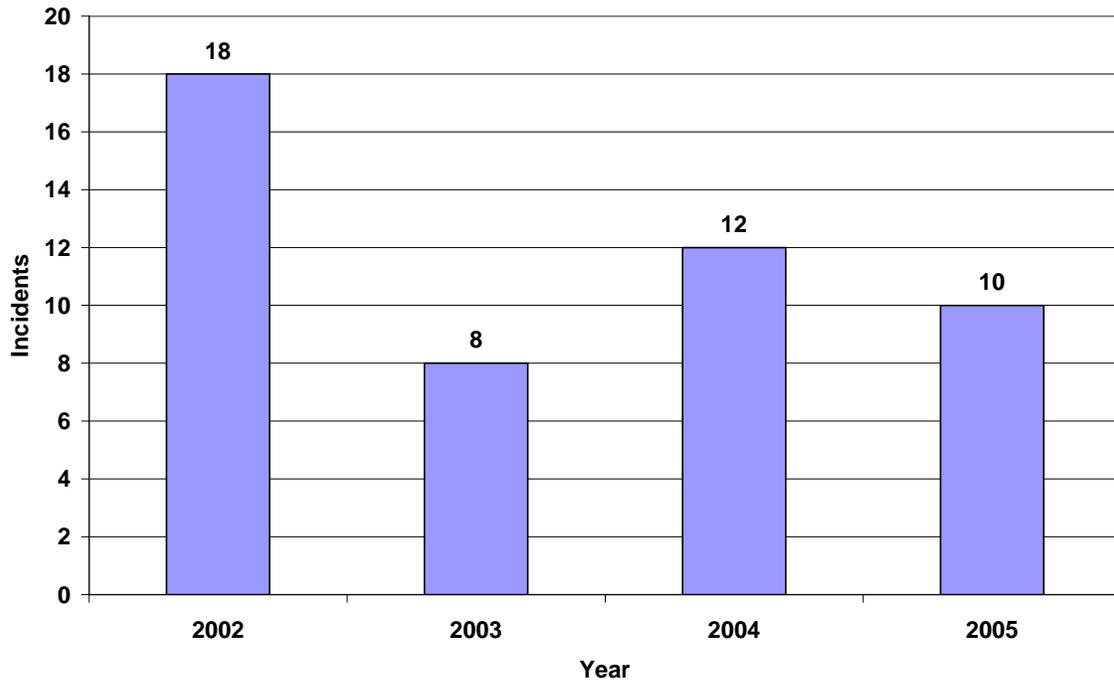
**Reporting Office:** Metro Transit

**Methodology:** A major transit incident is characterized as the existence of one or more of the following:

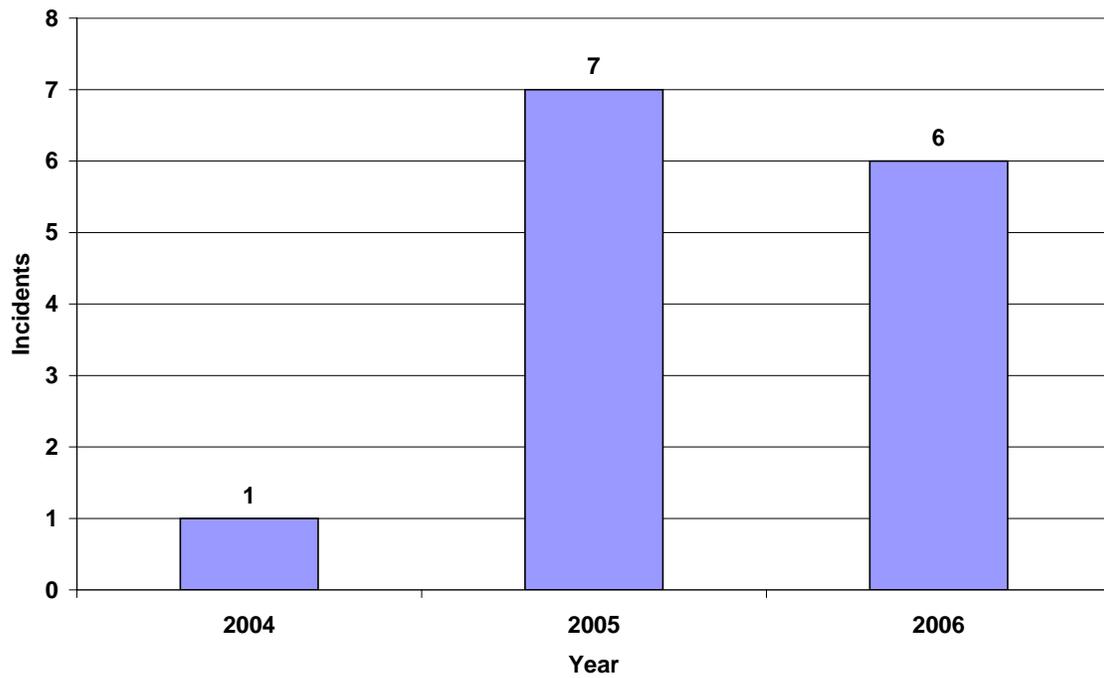
- A fatality other than a suicide
- Injuries requiring immediate medical attention away from the scene for two or more persons.
- Property damage equal to or exceeding \$25,000
- An evacuation due to life safety reasons.
- A collision at an at-grade crossing resulting in at least one injury requiring immediate medical attention away from the scene or property damage equal to or exceeding \$7,500.
- A mainline derailment
- A collision with person(s) on a rail right-of-way (ROW) resulting in injuries that require immediate medical attention away from the scene for one or more persons.
- A collision between a rail transit vehicle and another rail transit vehicle or a transit non-revenue vehicle resulting in injuries that require immediate medical attention away from the scene for one or more persons.
- Forcible rape
- Confirmed terrorist / security events (e.g., bombing, hijacking, etc.)

**Trends through 2005:**

Major Bus Incidents



Major Light Rail Incidents



### 1.10 General Aviation Fatalities

**Measure:** Annual fatalities resulting from general aviation crashes in Minnesota.

**Target:** Average fewer than seven fatalities per year over the next 10 years.

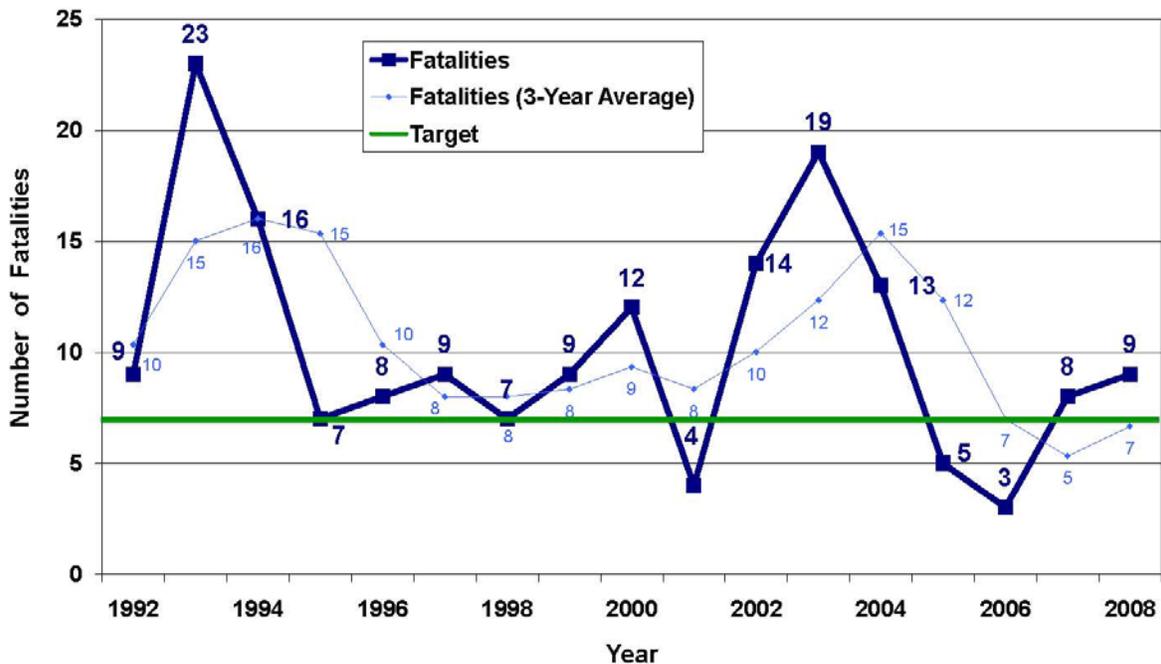
**Relevance/Purpose:** Safety is a primary mission of the Mn/DOT Office of Aeronautics; a mission that is consistent across all modes of transportation in Minnesota.

**Source:** National Transportation Safety Board (NTSB)

**Reporting Office:** Mn/DOT Office of Aeronautics

**Methodology:** This measure tracks the annual number of general aviation fatalities as reported and defined by the Federal Aviation Administration (FAA). The NTSB has the responsibility to investigate each aviation crash and determine the cause and corrective actions.

**Trends through 2008:** Average fatalities fell to the lowest number in decades in 2007. Better weather information dissemination, airport standards and coordination with FAA Safety Programs are the primary tools Mn/DOT uses to reduce accidents. A reduction in the percentage of single engine aircraft flights and increasing in-cockpit weather information systems may play a role in the positive trend. Finally, aircraft reliability continues to improve slightly.



## 1.11 General Aviation Accidents

**Measure:** Annual number of general aviation accidents in Minnesota.

**Target:** 33 or fewer general aviation accidents

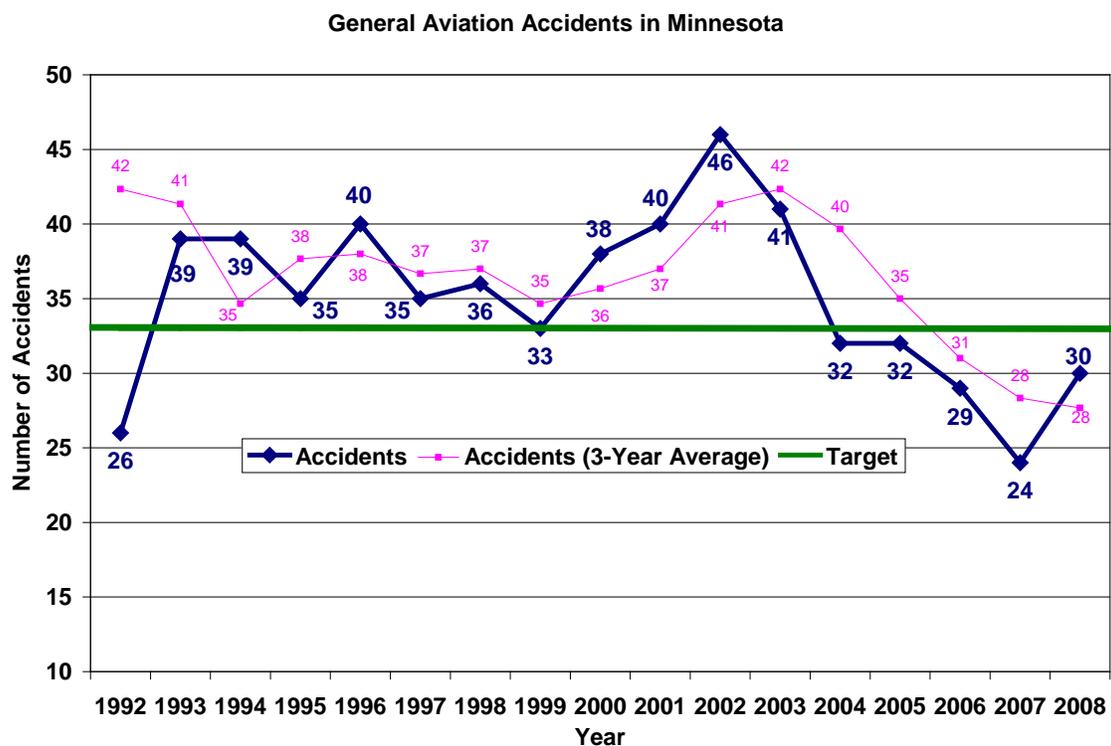
**Relevance/Purpose:** Safety is a primary mission of the Mn/DOT Office of Aeronautics; a mission that is consistent across all modes of transportation in Minnesota.

**Source:** National Transportation Safety Board (NTSB)

**Reporting Office:** Mn/DOT Office of Aeronautics

**Methodology:** This measure tracks the annual number of general aviation accidents reported by the NTSB and defined by the Federal Aviation Administration (FAA). The NTSB has the responsibility to investigate each aviation crash and determine the cause and corrective actions.

**Trends through 2008:** The three year average crash rate is currently the lowest it has been in decades and the target crash average of 33 per year is being met. Growth in turbo jet service may play a role in this as they generally have more experienced crews and the aircraft are more reliable. Better weather information dissemination, airport standards and Pilot Safety Seminar coordination with the FAA are the primary tools Mn/DOT is using to reduce accidents.



### 1.12 Passenger Carrier Safety

**Measure:** Passenger Carrier Safety Ratings.

**Target:** 95 percent of all passenger carriers should receive a satisfactory safety rating.

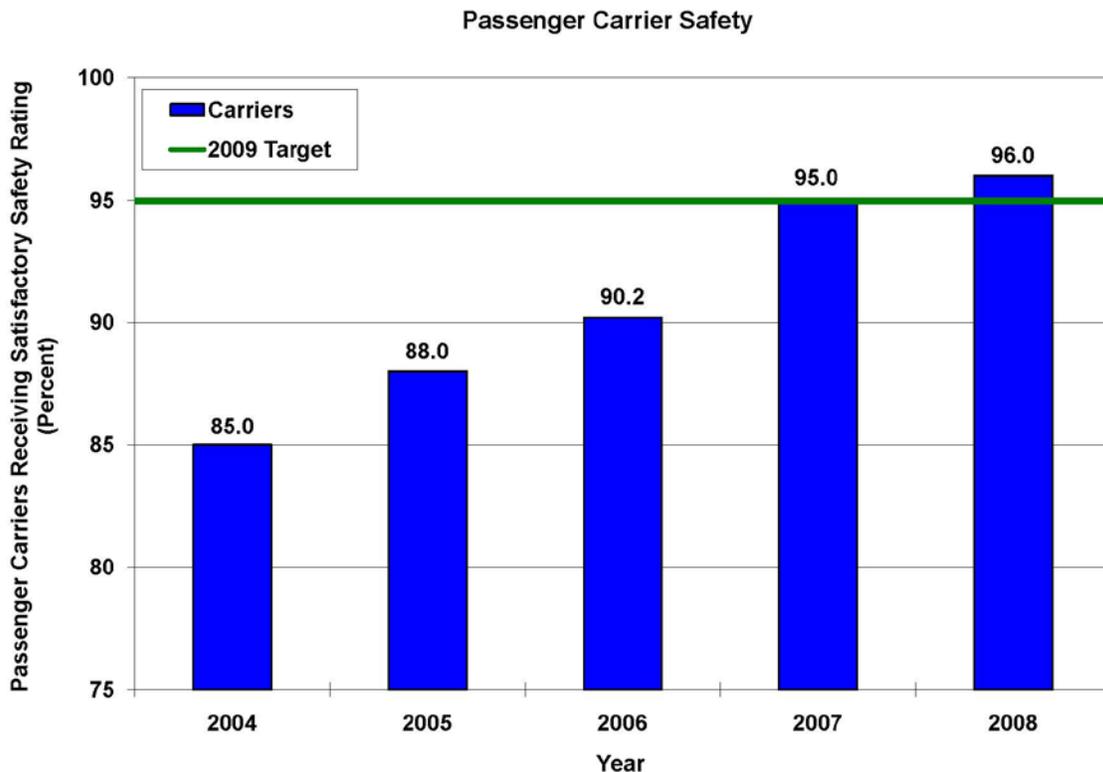
**Relevance/Purpose:** Mn/DOT’s Office of Freight and Commercial Vehicle Operations (OFCVO) administers safety laws and rules that apply to three types of passenger transportation providers. These are: Special Transportation Service (STS) providers, limousine service providers and motor carriers of passengers. In 2008 there were registered 199, 280 and 246 of these providers, respectively.

**Source:** Mn/DOT Office of Freight and Commercial Vehicle Operations

**Reporting Office:** Mn/DOT Office of Freight and Commercial Vehicle Operations

**Methodology:** OFCVO has developed and implemented a performance-based safety rating system for these segments of the passenger carrier industry. A satisfactory safety rating for each carrier is determined by using a computerized safety rating algorithm to analyze data gathered during audits.

**Trends through 2008:** In Fiscal Year 2008, 96 percent of all passenger carriers achieved a satisfactory rating. This was an improvement over Fiscal Year 2006 when 90.2 percent achieved a satisfactory rating.



## **Policy 1 Developmental Measures:**

### **Miles of Highway with Edge Treatments**

Edge treatments are cost effective and relatively low cost method for preventing run off the road crashes. Where practical, edge treatments will be incorporated into pavement preservation projects. This developmental measure would track the total centerline miles of state highways with edge treatments. Edge treatments include: rumble strips, rumble stripes and similar treatments as identified by Mn/DOT's Office of Traffic Safety and Technology. An inventory of roadways with and without edge treatments will be established.

### **Greater Minnesota Public Transit Safety**

This developmental measure, to be reported by Mn/DOT's Office of Transit beginning in 2009, will measure the number of reportable incidents for Greater Minnesota transit systems. For the purposes of this measure, a reportable incident is defined similarly to those outlined in Measure 1.9 - Transit Incidents in the Twin Cities Metropolitan Area. This information is gathered annually as part of the National Transit Database (NTD) Reporting form for individual transit systems.

### **Train Derailments**

This developmental measure will track the number of trains that derail in Minnesota as reported and defined by the Federal Railroad Administration (FRA). The premise of this developmental measure is that derailments have a relationship to how the rail companies operate and maintain their rail lines. In addition, derailments do pose some public health risk with respect to chemical spills. The FRA has the responsibility to investigate each derailment and determine the cause and corrective actions.

## Policy 2: Infrastructure Preservation

**Ensure the structural integrity of the transportation systems serving people and freight.**

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### 2.1 Structural Condition of State Highway Bridges

**Measure:** National Bridge Inventory (NBI) Structural Condition Index.

**Target:**

*Principal Arterial Bridge Condition:*

- Good Condition  $\geq$  55 percent
- Fair and Poor Condition  $\leq$  16 percent
- Poor Condition Target  $\leq$  2 percent

*Non-Principal Arterial Bridge Condition:*

- Good Condition  $\geq$  55 percent
- Fair and Poor Condition  $\leq$  20 percent
- Poor Condition Target  $\leq$  8 percent

**Relevance/Purpose:** Preserving the structural integrity of Minnesota's bridges is one of Mn/DOT's top priorities.

**Source:** Mn/DOT Bridge Office

**Reporting Office:** Mn/DOT Bridge Office

**Methodology:** The condition measure for state highway bridges is broad measure of the structural condition of a bridge based on the National Bridge Inventory (NBI) Structural Condition Index. The physical condition of Minnesota's bridges is determined through field inspections. Most Minnesota bridges are inspected on a two-year cycle, with the remaining bridges inspected annually by virtue of their condition. Each bridge is categorized as Good, or Poor by using four NBI Condition Codes and two NBI Appraisal Ratings.

The four NBI condition codes are Deck Condition, Superstructure Condition, Substructure Condition, and Culvert Condition. The two NBI appraisal ratings are structural Evaluation and Waterway Adequacy. Condition Codes and Appraisal Ratings use a scale from 0 to 9 where 9 is excellent and 0 is failed.

The criteria for the three categories are as follows:

- **GOOD** - If all of the condition codes (deck, superstructure, substructure, or culvert) are 7 or greater, and both of the appraisal ratings (structural evaluation and waterway adequacy) are 6 or greater.
- **FAIR** - If any of the condition codes (deck, superstructure, substructure, or culvert) are 5, or either of the appraisal ratings (structural evaluation or waterway adequacy) are 3 or 4.
- **POOR** - If any of the condition codes (deck, superstructure, substructure, or culvert) are 4 or less, or either of the appraisal ratings (structural evaluation or waterway adequacy) is 2 or less (this is defined as Structurally Deficient).

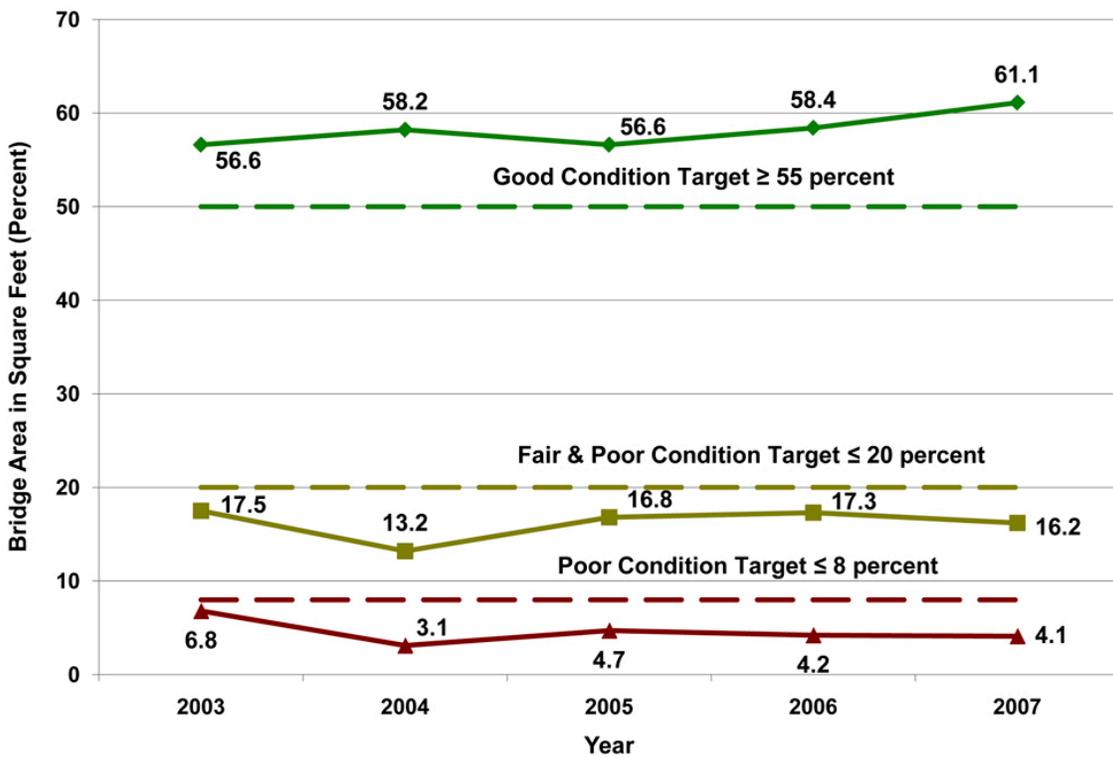
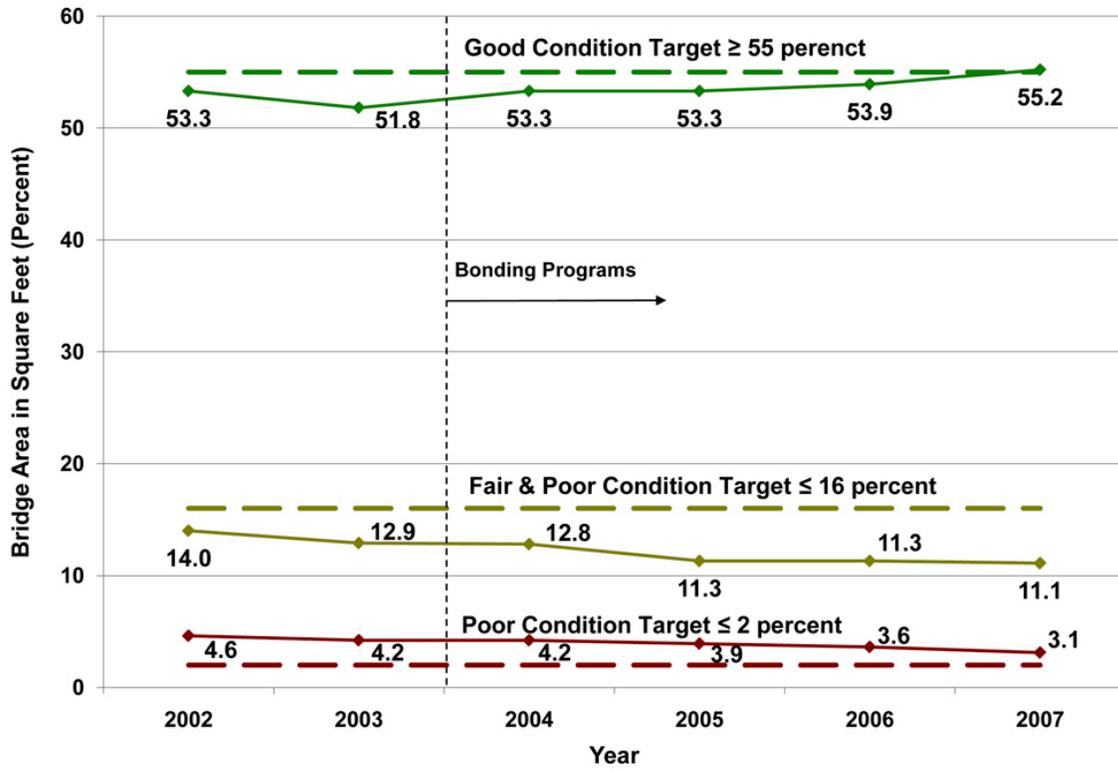
If the bridge qualifies in more than one category, it will be placed in the poorest category.

**Trends through 2007:** Based on these system performance measures, bridge conditions have held steady and/or improved slightly in recent years. As a percentage of total bridge deck area, principal arterial and non-principal arterial bridges in “good” condition have both increased since 2003. Principal arterial bridges surpassed the target of 55 percent in both 2006 and 2007, while non-principal arterial bridges have consistently met targets for the past 5 years. The recent upward trend is largely a result of bridge replacement and system expansion.

The percent of total deck area in the combined “fair” and “poor” category has been steady and continues to meet the targets for both principal and non-principal arterial bridges.

Bridge deck area in “poor” condition (structurally deficient) has been fairly steady for both principal and non-principal arterial bridges. Principal arterial bridges fail to meet targets for the percentage of system in “poor” condition, while non-principal arterial bridges have met targets. The percentage of bridge deck area in poor condition will begin to improve as larger bridges are programmed for replacement in the short term.

In 2008, Mn/DOT identified 172 bridges which met the criteria in Minnesota Laws 2008, Chapter 152. The bridges were prioritized into three tiers by traffic volumes, Sufficiency Rating, Fracture Critical, and Structurally Deficient Status. Most of these bridges are being or will be replaced or rehabilitated by 2018. This continuing emphasis on bridge improvement is expected to cause an overall improvement in statewide bridge condition. It is anticipated that bridge condition will meet or exceed target levels of 55 percent “Good” and 2 percent “Poor” during the next decade. While significant improvements in measures have been made, much of the improvement can be attributed to funding of major bridges. It is also important to continue to address other bridge preservation needs.



## 2.2 Ride Quality Index (RQI) for State Highway Pavements

**Measure:** Ride Quality Index (RQI).

**Target:** The objective is to provide a smooth ride (good condition = rating of three or better) for a large percentage of the state highway system and limit the number of miles that have a rough ride (poor condition = two or less).

*Principal Arterials:*

- Percentage of Highway System in Good Condition: 70 percent
- Percentage of Highway System in Poor Condition: 2 percent

*Non-Principal Arterial Condition:*

- Percentage of Highway System in Good Condition: 65 percent
- Percentage of Highway System in Poor Condition: 3 percent

**Relevance/Purpose:** Mn/DOT annually collects roughness data on the entire system and surface distress data on approximately 60 percent of the system. This data is the primary input into Mn/DOT's pavement model used to make trend based projections of future performance. The RQI measure both reflects the traveling public's experience with the pavement and is used along with the measure of surface distress to measure pavement quality.

**Source:** Mn/DOT Office of Materials and Road Research

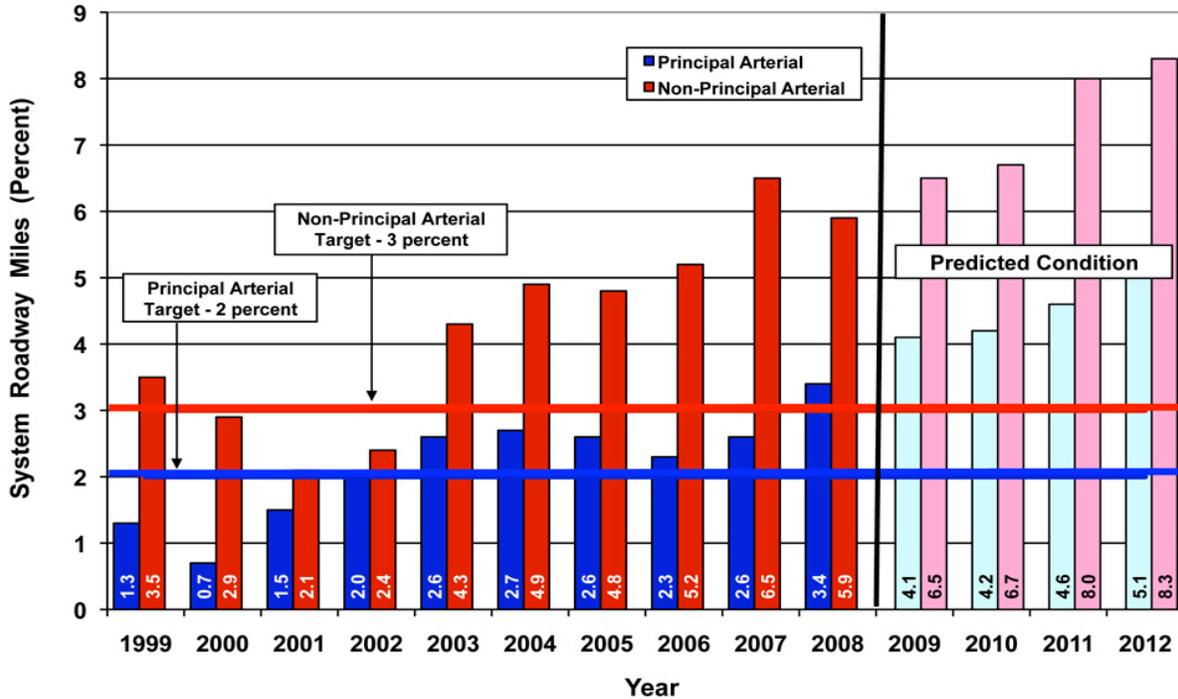
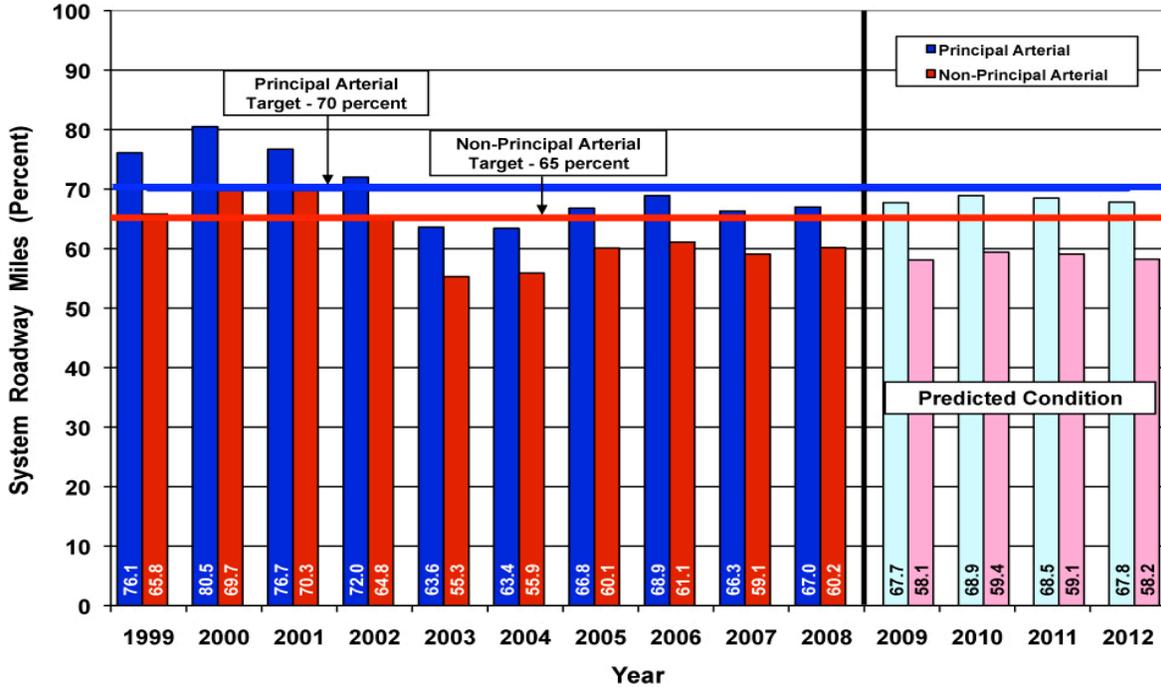
**Reporting Office:** Mn/DOT Office of Materials and Road Research

**Methodology:** The RQI is Mn/DOT's ride or smoothness index. It uses a zero to five rating scale, rounded to the nearest tenth. The higher the RQI, the smoother the road is. The RQI is intended to represent the rating that a typical road user would give to the pavement's smoothness as felt while driving his/her vehicle. Most new construction projects have an initial RQI slightly over 4.0. Pavements are normally designed for a terminal RQI value of 2.5. When a road has reached its terminal RQI value it doesn't mean the road can't be driven on, but rather that it has deteriorated to the point where most people feel it is uncomfortable and a major rehabilitation is likely needed.

The RQI is calculated from the pavement's longitudinal profile, measured by the front mounted lasers on the digital inspection vehicle. A mathematical simulation, called the International Roughness Index (IRI), is then done to estimate the amount of vertical movement a standard vehicle would experience if driven down the road. The IRI is the roughness index used by every state department of transportation in the U.S. as well as most countries in the world. In the past, Mn/DOT has taken a rating panel of 30 to 40 people out in the field and driven them over hundreds of test sections to get their perception of the smoothness of various pavement sections. Following right behind them was the digital inspection vehicle. This provides us with a direct correlation between the IRI, as measured by the van, and the perceived roughness, as felt by the rating panel.

The pavement measures have been broken into two sub-sets of state highways - one for principal arterials (roadways that have the highest levels of traffic and connect major trade centers) and one for non-principal arterials (all other state highways).

**Trends through 2008:** The following two figures show the pavement condition trends for both principal arterials and non-principal arterials. The performance trend shows that the percentage of “good” pavements has declined while the percentage of “poor” pavements has increased. Based on the pavement model, this trend is expected to continue with the present level of transportation funding.



## 2.3 Remaining Service Life (RSL) for State Highway Pavements

**Measure:** Average Remaining Service Life (ARSL).

**Target:** There is no target associated with this measure.

**Relevance/Purpose:** The Remaining Service Life (RSL) is an estimate, in years, until the Ride Quality Index (RQI) of a given road segment will reach a value of 2.5. This is generally considered to be the end of a pavement's design life. Most pavements will need some type of major rehabilitation or reconstruction when the RQI has reached this value (the average remaining service reflects the cumulative condition of the entire network).

**Source:** Mn/DOT Office of Materials and Road Research

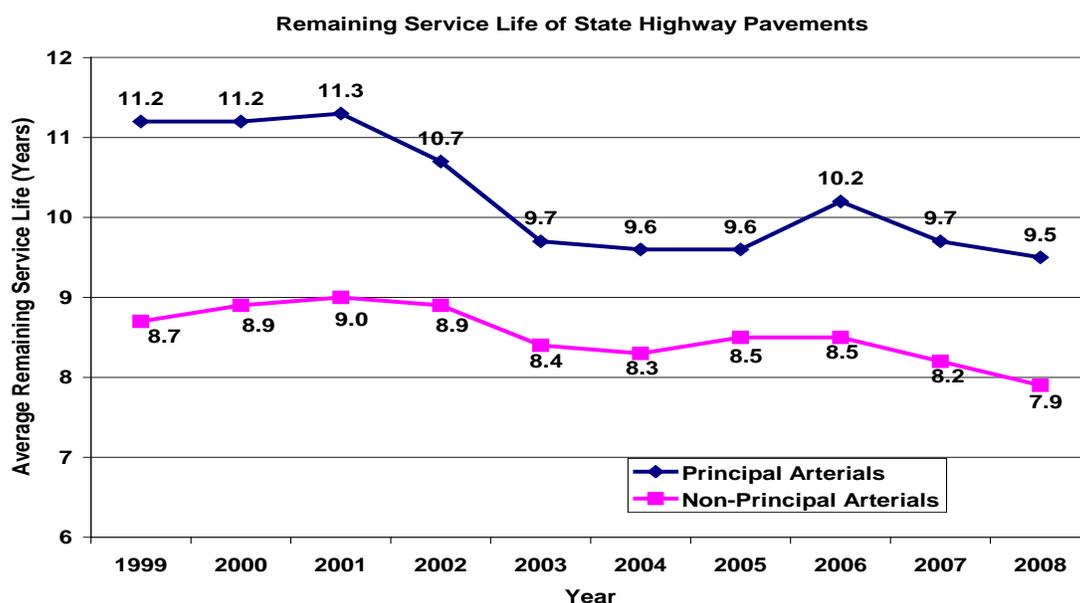
**Reporting Office:** Mn/DOT Office of Materials and Road Research

**Methodology:** The RSL is determined from pavement deterioration curves applied to the current data. A curve is fitted through the historical RQI data for each pavement section and the year the RQI will reach 2.5 is estimated.

If there is inadequate historical data to make this calculation, default models based on statewide pavement performance are used. Rehabilitation activities with long service lives will add a considerable number of years to the RSL of a pavement. Short-term fixes, such as patching, may increase pavement smoothness briefly, but do not result in additional years of RSL.

Each year, the RSL is calculated for all highway segments. From these values, a length-weighted Average Remaining Service Life (ARSL) is calculated for the entire trunk highway system as well as for each Area Transportation Partnership (ATP) region. The ARSL provides a measure of whether the fixes applied to the trunk highway system are mostly long- or short-term.

**Trends through 2008:** The chart shows statewide ARSL, which declined over the past decade.



## 2.4 Physical Condition of Safety Rest Areas

**Measure:** Physical condition of Mn/DOT's Class I Rest Area System as measured by the Facilities Conditions Index (FCI).

**Target:** 70 percent or more of Minnesota's Class I Safety Rest Areas should have a composite FCI rating between 0 and 25 and 96 percent or more should have an FCI rating between 0 and 45.

**Relevance/Purpose:** Minnesota has long recognized the value of safety rest areas. During the Interstate construction era from the 1960s through the early 1980s, the state developed a safety rest area system on both Interstate and Non-Interstate highways. While the system has undergone changes, it continues to contribute to improved highway safety and provides a valuable service to transportation users.

Rest areas serve as a practical way to provide motorists, including commercial motor vehicle operators, a convenient opportunity to stop, rest, and refresh. The primary purpose of safety rest areas is to reduce accidents caused by driver fatigue. However, rest areas also:

- Reduce motorist need for shoulder stops
- Reduce driving under hazardous weather and road conditions
- Offer customer services
- Promote the state
- Promote statewide tourism

**Source:** Mn/DOT Office of Technical Support

**Reporting Office:** Mn/DOT Office of Technical Support

**Methodology:** In 2007, Mn/DOT established a management system, developed assessment criteria, and conducted its first comprehensive condition rating of its Class I rest areas. The condition rating is an average of the Building FCI and the Parking FCI for the individual rest area. The closer the FCI composite score is to zero the better the physical condition of the rest area is considered.

**Trends:** The comprehensive condition ratings were first completed in 2007. At that time, just 62 percent or more rest areas had FCI ratings between 0 and 25, while 88 percent had an FCI between 0 and 45. Looking forward, the rating system is intended to be used to periodically assess the condition of the safety rest area system and individual safety rest areas, begin to quantify and prioritize the needs within the system, and assist Mn/DOT in determining when safety rest areas require renovation or replacement.

## 2.5 Remaining Service Life (RSL) of State Highway Signage

**Measure:** Percent of signs with a remaining life within the expected service life.

**Target:** 95 percent of signs will be within the expected 12 year life cycle.

**Relevance/Purpose:** Highway signs provide regulatory, warning, and guidance information to road users. Both words and symbols are used to convey messages to drivers to aid them in their trip. Regulatory signs give notice to traffic laws or regulations. Warning signs give notice of system conditions that might not be readily apparent, and guide signs show route designations, directions, distances, services, points of interest, and other geographical, recreational or cultural information. The preservation objective is to maintain the inventory of signs such that they continue to be highly visible in both day and night.

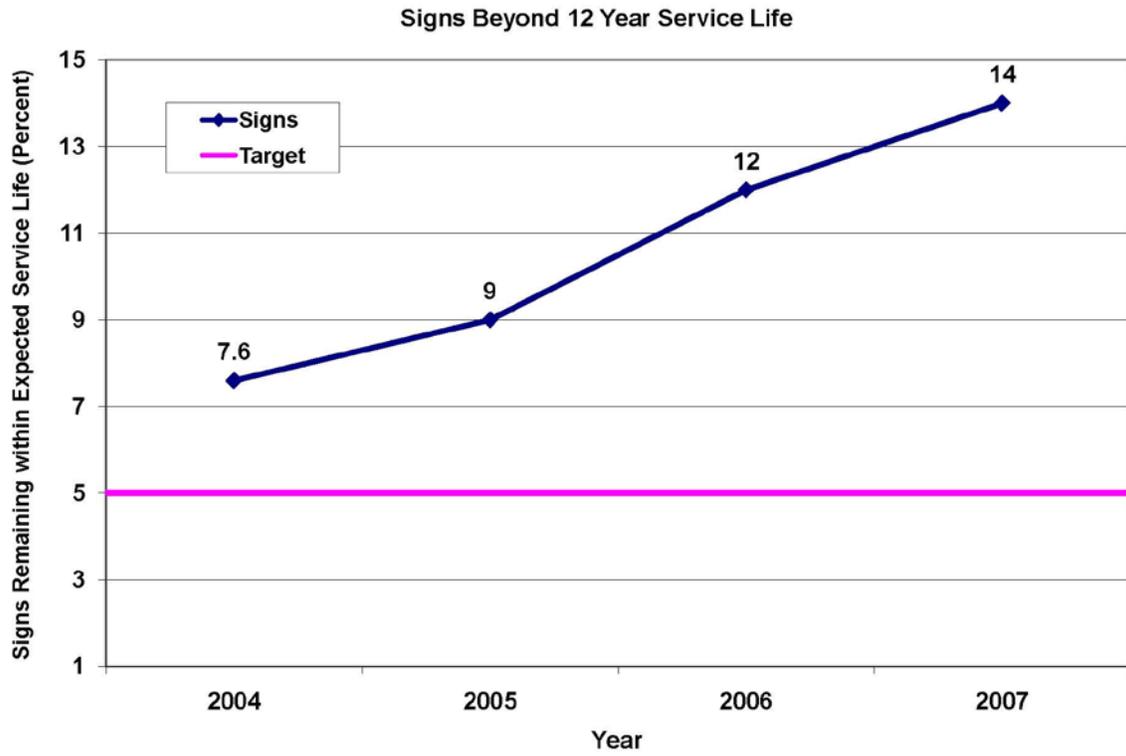
**Source:** Mn/DOT Office of Traffic Safety and Technology

**Reporting Office:** Mn/DOT Office of Traffic Safety and Technology

**Methodology:** To date, Mn/DOT's ability to track this measure has been limited by the lack of a statewide sign management system or a comprehensive sign inventory. For several Districts, the condition of the sign inventories has been based on estimates. Mn/DOT has now identified procedures and selected a software package to be used in developing a statewide sign inventory. Districts 4, 7, and 8 have completed their initial field data collection and have a current sign inventory and sign management system. The remaining Districts are on schedule to complete their inventory by the end of 2009. At that point, the measure will be based on field data and Districts will be able to track the age of all signs by location.

**Trends through 2007:** Since this measure was introduced in 2004, it is estimated that the number of signs beyond the 12-year life cycle has increased from 7.6 percent to 14 percent. This rise in backlog has been attributed to lack of staff, an increasing number of new signs and, in some Districts, a need to respond to an increase in sign vandalism.

In 2000, Mn/DOT transitioned to a new sign sheeting material that is expected to not only improve visibility over the life of a sign but also increase the expected service life from 12 to 15 years. By 2013 all signs with the older sheeting will have been replaced. At that time, the performance measure will be modified to reflect this change.



## 2.6 Pavement Condition for Public Airports in Greater Minnesota

**Measure:** Percent of Regional Trade Centers (RTC) airport pavements that meet “Good” (PCI rating  $\geq$  56) and “Poor” (PCI rating  $\leq$  4) Pavement Condition Index (PCI) targets.

**Target:** Percent of applicable airports meeting the following targets:

*Good:* 83 percent

*Poor:* 5 percent

**Relevance/Purpose:** Considerable investment from a variety of public and private sources has gone into developing Minnesota’s existing public airport system. An important goal for this airport system is to maximize and preserve, where possible, the return on investment.

The physical condition of airport runways, taxiways, and aprons is important for assessing the quality and safety of air service facilities throughout the state.

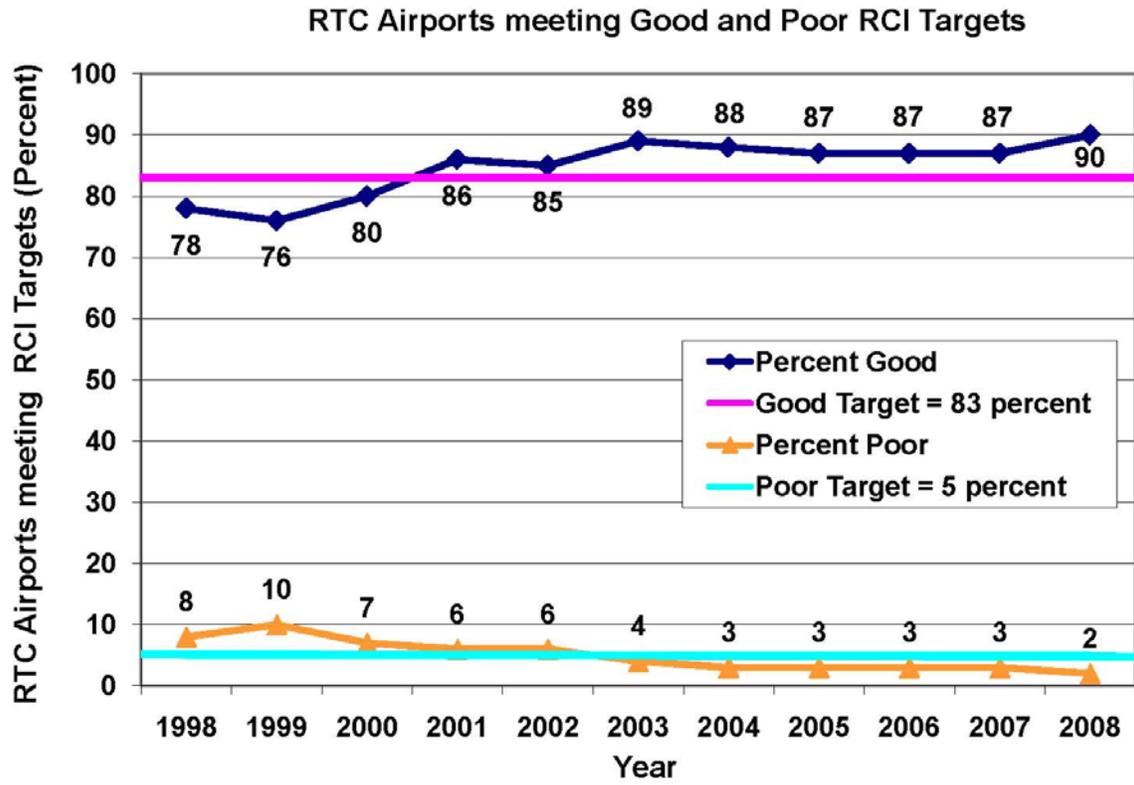
**Source:** Mn/DOT Office of Aeronautics

**Reporting Office:** Mn/DOT Office of Aeronautics

**Methodology:** The Pavement Condition Index (PCI), developed by the U.S. Army Corps of Engineers, is used by the Federal Aviation Administration and Mn/DOT Office of Aeronautics to determine runway, taxiway, and apron pavement conditions. The PCI measures the pavement's structural integrity and surface operational condition. PCI is determined by measuring pavement distress. This method has been field-tested and has proven to be a useful device for determining investment needs and priorities

PCI information is compiled for paved airports on a rotating basis every three years. The rating is based on a scale of 0 to 100. Pavements in “good” condition have ratings of 56 and greater, while pavements in “poor” condition have ratings of 40 or less. The measure is computed based on the percentage of total runway, taxiway, and aprons that meet “good” and “poor” condition ratings. The targets apply to the 60 runways of general aviation airports in Levels 1-3 Regional Trade Centers. The measure is expected to expand to all paved Greater Minnesota airports in future years.

**Trends through 2008:** Performance results have surpassed targets set in the 2003 Statewide Transportation Plan.



## 2.7 Remaining Service Life (RSL) for Transit Fleets in Greater Minnesota

**Measure:** Percent of Greater Minnesota transit fleet with a remaining life within the minimum normal service life.

**Target:** 80 percent of the transit fleet will be within the normal service life.

**Relevance/Purpose:** Transit fleet vehicles are an important component of the infrastructure necessary to deliver transit passenger services. When vehicles get older, there are increased issues with maintenance and availability that need to be monitored closely to ensure that regular services can be provided to customers. This measure evaluates the transit fleet available to customers in Greater Minnesota (the Metropolitan Council is responsible for the service life of transit vehicles in the Twin Cities Metropolitan Area).

**Source:** Mn/DOT Office of Transit

**Reporting Office:** Mn/DOT Office of Transit

**Methodology:** This measure is applied separately to each of the five vehicle classifications or vehicle types that are used by transit agencies in Greater Minnesota. Industry standards for service life have been established both in terms of mileage and years. Recommended service life ranges from five years or 100,000 miles for the smallest light duty vehicle to 15 years or 500,000 miles for the largest heavy duty bus.

**Trends through 2007:** As of 2007, there were 582 vehicles in service throughout Greater Minnesota. Fleet changes between 2004 and 2005 show growth in the overall number of vehicles. However, as new vehicles are added, the trend has been to retain older vehicles as backups. The impact of this is most evident in Class 400, or medium light duty vehicle category, where 72 vehicles exceed service life. However, 35 vehicles are identified as backups. The age and number of backup vehicles will vary depending on the fleet maintenance strategy of a particular agency and does not directly affect investment in the operating fleet. Omitting backup vehicles from the analysis, fleet condition has steadily improved from 78 percent within life cycle in 2003 to 90 percent in 2007, exceeding the target of 80 percent.



## 2.8 Average Bus Age for Metro Transit's Fleet

**Indicator:** Average age of buses in Metro Transit's fleet.

**Relevance/Purpose:** Metro Transit's buses are an integral part of the Twin Cities Metropolitan Area's transportation system. Buses will continue to be the primary mode of transit within the region despite establishment of the Hiawatha Light Rail Line in 2004 and the Central Corridor Light Rail Line currently scheduled to begin operation in 2014. As a result, buses will continue to collectively constitute Metro Transit's largest capital asset. As of 2008, Metro Transit maintained a fleet of 889 buses, 753 of which were in use at peak operations.

**Source:** Metro Transit

**Reporting Office:** Mn/DOT Office of Transit

**Methodology:** The age of all buses in Metro Transit's fleet was considered and then averaged to determine the average bus age.

**Trends:** The average age of buses in Metro Transit's fleet in 2008 was 5.95 years.

## 2.9 Ride Quality Index (RQI) for County Highway Pavements

**Indicator:** Lane-miles of County State Aid Highway (CSAH) pavement that have good or poor ride quality as measured statewide using the Ride Quality Index (RQI).

**Relevance/Purpose:** This indicator tracks pavement conditions on roads that are not owned by Mn/DOT.

**Source:** Mn/DOT Office of Materials and Road Research

**Reporting Office:** Mn/DOT Office of Materials and Road Research

**Methodology:** County, municipal, and township road networks together account for 243,000 lane miles (87 percent of the state total). In 2005, Mn/DOT began collecting pavement condition data on all County State Aid Highways in the state. There are plans to collect data for the entire system on a four-year cycle (i.e., data collected on 25 percent of Minnesota counties each year). The Ride Quality Index scores and the video logs are provided to the counties, some of which have pavement condition models, to be used in planning future investments.

**Trends:** The following RQI scores are based on data from 70 of Minnesota's 87 counties, which was available at the end of 2007.

- *Good (ride quality index of 3.0 or above)* = 63.1 percent
- *Poor (ride quality index of 2.0 or below)* = 3.6 percent

## **2.10 Structural Condition for Local Road Bridges**

**Indicator:** Percent of local bridges (county, township, and city) that are structurally deficient.

**Relevance/Purpose:** This indicator tracks conditions of bridges not owned by Mn/DOT.

**Source:** Mn/DOT Bridge Office

**Reporting Office:** Mn/DOT Bridge Office

**Methodology:** All state and local bridges are subject to scheduled inspections. There are 14,774 bridges (76 percent % of the state total) on the local system.

**Trends:** According to Mn/DOT's 2008 Bridge Report, 11.1 percent of all local bridges (county, township, and city) are structurally deficient.

## **Policy 2 Developmental Measures:**

### **Track Speed on Class 2 and 3 Railroads**

The Statewide Passenger and Freight Rail Plan will develop a measure tracking the percent or number of Class 2 (Regional Railroads) and Class 3 (Local or Short-line Railroads) rail track-miles with track speeds  $\leq 25$  miles per hour. Twenty-three railroad companies and three private industries haul rail freight in Minnesota on approximately 4,526 miles of track. Rail freight in Minnesota accounts for 33 percent of the total tonnage moved in the state. The two performance indicators for the condition of the rail are allowable speed and weight limitation. The Federal Railroad Administration sets speed ratings based on the ability of a segment of track to carry a load safely. Similarly, weight ratings placed on rail segments reflect both the sufficiency of the design to meet current train loads and condition of the infrastructure. In 2007, of the 1250 miles of Class 2 and 3 rail track-miles, 59 percent of had track speeds  $\leq 25$  miles per hour.

### **Drainage System Condition**

A measure is currently under development to address the condition of Mn/DOT's drainage systems. Mn/DOT's drainage infrastructure includes culverts (with spans less than 10 feet) storm drains, storm tunnels, ditches, stormwater retention ponds, and other devices that are required to convey water under roads, drain the road surface, and treat the stormwater runoff to meet environmental regulations. As a matter of practice, capital needs for drainage infrastructure have generally been addressed as part of larger road construction projects. However, it is becoming increasingly apparent that this approach is not sufficient and that this infrastructure may need to be tracked and managed as a separate category. Because there are fewer major construction, reconstruction, or larger resurfacing projects, there are fewer opportunities to address drainage issues. Also, drainage infrastructure needs do not always align with planned roadway projects.

## **Mn/DOT is also exploring the feasibility of the following preservation measures:**

**Condition of State Highway Signals and Lighting**

**Port Conditions**

## Policy 3: Maintenance and Security

**Maintain and operate the statewide transportation in an efficient, cost-effective, and secure manner.**

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### 3.1 Bridge Inspection

**Measure:** On time routine and fracture critical bridge inspections.

**Target:** A draft target has been established to complete 100 percent of the scheduled routine and fracture critical bridge inspections on time.

**Relevance/Purpose:** National Bridge Inspection Standards (NBIS) requires inspections to be completed within 24 months of a previous inspection. Mn/DOT requires more frequent inspections for bridges in poor condition. Bridge inspection progress was first reported at Mn/DOT in early 2009.

**Source:** Bridge Inspection Maintenance Assessment forms and Pontis database

**Reporting Office:** Mn/DOT Bridge Office

**Methodology:** Districts are using a standardized bridge inspection maintenance assessment form during inspections. Inspections are on-time if completed by the due date + 30 days of a previous inspection. The additional 30 days prevents inspections from having to be done earlier and earlier each time to be completed by the due date.

**Trends:** In 2007, 86 percent of routine inspections occurred on time while 100 percent of fracture critical inspections occurred on time. On time performance of routine inspections increased to 89 percent in 2008 while all fracture critical inspections remained on time.

### 3.2 Bridge Reactive Maintenance

**Measure:** High priority bridge reactive maintenance completed

**Target:** The target for this measure is under development.

**Relevance/Purpose:** A 2008 Legislative Auditor Report recommended that Mn/DOT establish standard procedures for documenting, communicating, and following up on bridge inspectors' maintenance recommendations. This measure will report the percentage of High Priority Reactive Maintenance complete. High priority reactive maintenance includes items that are hazards to the public and items that may degrade quickly to impact the safe function of the bridge.

**Source:** District bridge inspection and maintenance tracking spreadsheets

**Reporting Office:** Mn/DOT Bridge Office

**Methodology:** A standardized bridge maintenance planning spreadsheet is being used for prioritizing maintenance needs and reporting completion of required reactive bridge maintenance repairs. Districts will report the percentage of required High Priority Reactive Maintenance complete.

**Trends:** This is a new measure. Data on the percentage of required High Priority Reactive Maintenance complete will be reported annually for the first time near the end of 2009 and each year thereafter.

### 3.3 Bridge Preventive Maintenance

**Measure:** Scheduled bridge preventive maintenance completed.

**Target:** The target for this measure is under development.

**Relevance/Purpose:** Preventive bridge maintenance activities extend bridge life and lower long-term ownership costs. Activities include joint repairs, deck flushing, crack sealing, deck and rail sealing, and spot painting. Preventive maintenance activities only apply to bridges in good condition (decks with and NBI rating of 6 or above) and only to elements in fairly good condition (elements in poor condition should be scheduled for reactive maintenance). Preventive maintenance is scheduled based on inspected element condition ratings and guidelines.

**Source:** Districts report completed preventive maintenance work compared to work scheduled.

**Reporting Office:** Mn/DOT Bridge Office

**Methodology:** The following four preventive maintenance activities are required: deck crack sealing; poured joint sealing (poured deck seals); strip seal joint repairs; and spot paint repairs on truss gusset plates. Draft performance targets have been established for each maintenance activity as the percent rated in good (CS1) condition using Pontis elements (other activities are recommended, with suggested frequencies that are not part of this measure).

**Trends:** Spending on bridge preventive maintenance increased when the legislature authorized additional maintenance funding in FY 2006. Chapter 152 bridge funding will aid in completion of additional targeted bridge preventive maintenance activities. This measure will be reported in late 2009. It will report the percentage of scheduled preventive maintenance completed. The four required bridge preventive maintenance activities are presented in the table below with trend data where available.

Required Activities	Percent in Good Condition				Draft Target (Percent)
	2002	2004	2006	2008	
Deck Crack Sealing	44	38	42	48	80
Poured Joint Repairs (Poured Deck Seals)	73	74	77	77	87
Strip Seal Joint Repairs	94	92	91	92	95
Spot Paint Repairs - Truss Gusset Plates*					95

\*No data available

### 3.4 Snow and Ice Removal

**Measure:** Frequency of achieving bare lane within targeted number of hours.

**Target:** A draft target has been established stating that target regain time was met over an entire winter season 70 percent of the time.

**Relevance/Purpose:** The safety of Minnesota’s traveling public is the primary goal of Mn/DOT’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. Snow and ice management can also greatly reduce congestion due to weather events.

**Source:** Mn/DOT Maintenance Office

**Reporting Office:** Mn/DOT Maintenance Office

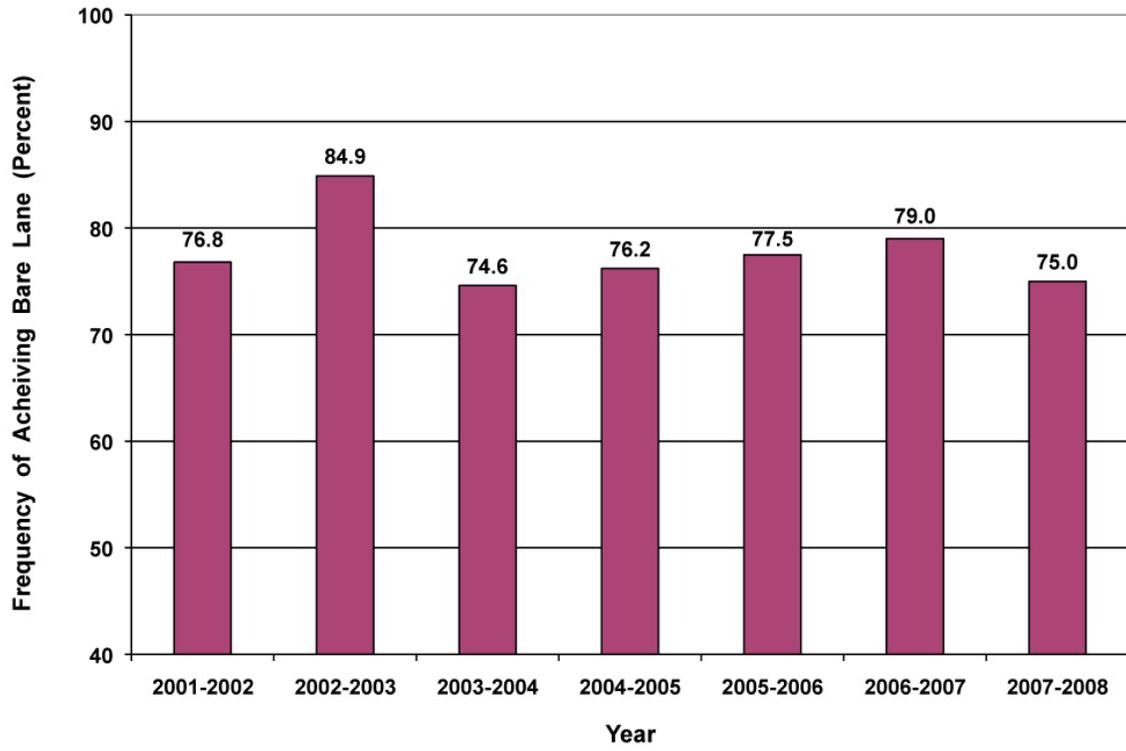
**Methodology:** The draft target is a measure of whether the target regain time (the time when bare lane is achieved following a weather event) was met or exceeded for each plow route for each event. These individual answers are then aggregated over the entire winter season.

Targets are also identified for the number of hours after a weather event ends before bare lane is achieved (regain time) for each of five roadway categories. The table below shows the five roadway categories, along with average daily traffic volumes, target clearance times, and average clearance times for the 2007 – 2008 winter season.

Roadway Category	Average Daily Traffic	Target Clearance Time	2007 - 2008 Average Clearance Time
Super Commuter	Over 30,000	0 to 3 hours	2.5 hours
Urban Commuter	10,000 - 30,000	2 to 5 hours	5.3 hours
Rural Commuter	2,000 - 10,000	4 to 9 hours	6.9 hours
Primary Collector	800 - 2,000	6 to 12 hours	8.2 hours
Secondary Collector	Under 800	9 to 36 hours	12.9 hours

Mn/DOT’s snow and ice removal target level of service is based on market research and varies by roadway traffic volume. Districts record the time it takes to reach bare lane after a weather event ends into the Work Management System (WMS) database.

**Trends through 2007 – 2008:** Historically, Mn/DOT has met established clearance time targets for each of the five roadway categories in most years. As a result, Mn/DOT has exceeded the draft frequency of achieving bare lane target for the past seven winters (see figure below). The most recent winter season for which data is available, the 2007-2008 winter, the target clearance time was met 75 percent of the time.



### 3.5 Pavement Patching

**Measure:** Miles of roads patched in a season as a percentage of the miles with a Surface Rating of 3.2 or lower.

**Target:** 90 percent of the number of miles of roads identified with a Surface Rating of 3.2 or lower patched.

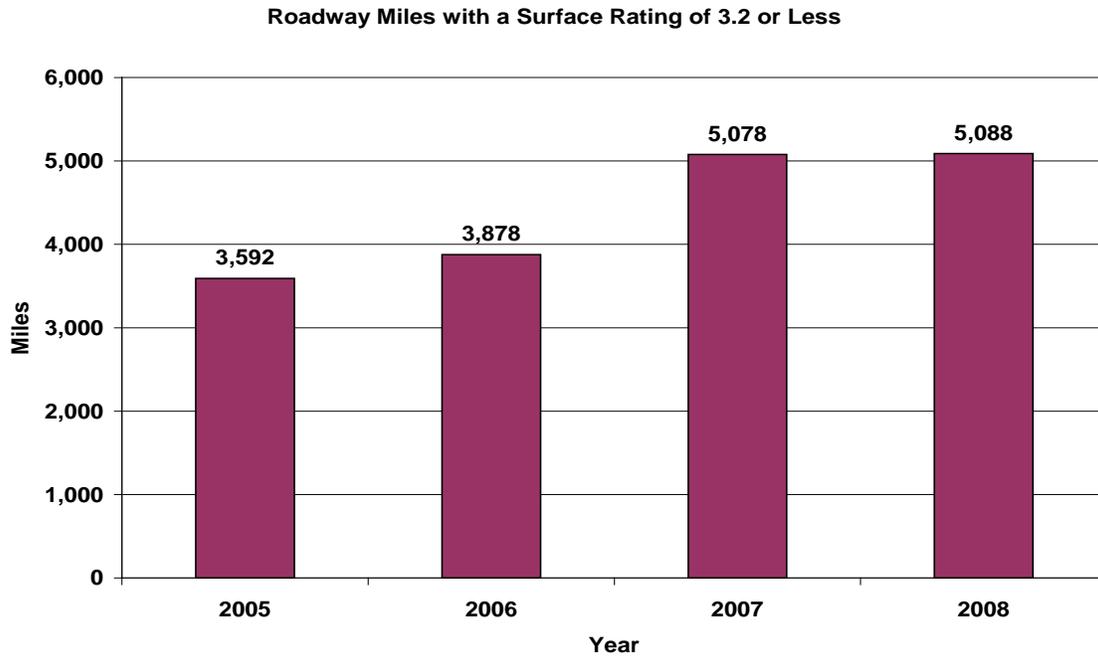
**Relevance/Purpose:** Mn/DOT maintenance crews perform pavement patching, a reactive maintenance treatment, to maintain pavement conditions until major rehabilitation and/or reconstruction activities can be done. Pavement patching is needed to address pavement distresses such as cracking, rutting and potholes, which are most often associated with a poor ride and limited roadway strength. Potholes and other pavement distresses affect mobility and safety of the traveling public. It is Mn/DOT's policy to repair these. However, the level of repairs or "fixes" is dependent upon the amount of patching dollars available, weather conditions, and the timing for future rehabilitations and/or upgrades. Pavement Patching was identified as a priority for HSOP funds and the new Chapter 152 funds.

**Source:** Surface Rating (SR) reported by the Materials Office; Districts report which roads are patched.

**Reporting Office:** Districts and Maintenance Business Management Team

**Methodology:** Surface Rating will be used as an "indicator of needs." It has been determined that roads with a Surface Rating of 3.2 or less are a good indicator of the quantity of patching need. A target of 90 percent is being used since some roads in this condition would be scheduled for reconstruction and would not be patched, and some types of pavement distresses are not suitably repaired by our patching activities.

**Trends through 2008:** This is a new measure and the percentage of miles patched is not yet available. However data is available on the number of roadway miles with an SR of 3.2 or less, the indicator of system need adopted for this measure. The chart below shows the trend of roadway miles statewide with an SR of 3.2 or less.



### 3.6 Pavement Markings Meeting Life Expectancy and Retro-Reflectivity Standards

**Measure:** Miles of pavement markings meeting standards.

**Target:** 100 percent of system meeting standards by December 2009.

**Relevance/Purpose:** Pavement markings have an important function to perform in managing, directing, and controlling traffic. Pavement markings provide the best vehicle guidance to the motorist, especially in low visibility conditions, thereby minimizing the risk of the motorist leaving their travel lane. Mn/DOT has made significant investment and effort toward providing appropriate pavement markings on all highways, 365 days a year.

**Source:** Districts' annual construction striping plans and maintenance striping requests submitted to the Office of Traffic, Safety, and Technology.

**Reporting Office:** Office of Traffic, Safety, and Technology

**Methodology:** Technical Memorandum No. 08-10-T-02 "Mn/DOT Policy for Pavement Marking Operations Compliance" establishes the standards against which pavement markings are measured. The standards are a combination of minimum retro-reflectivity; and life expectancy of the pavement marking based on traffic volumes, type of pavement marking material, and anticipated life of existing pavement. Condition data is drawn from Districts' annual striping plan and maintenance requests.

**Trends:** As of March 2009, 99.6 percent of the system is compliant.

### 3.7 Customer Satisfaction with State Highway Maintenance

**Measure:** Customer rating of Mn/DOT’s performance in “Overall State Roads Maintenance” measured on a scale of 1 to 10.

**Target:** Overall customer ratings with maintenance of state highways will be maintained at 7.0 or higher on a 10 point scale.

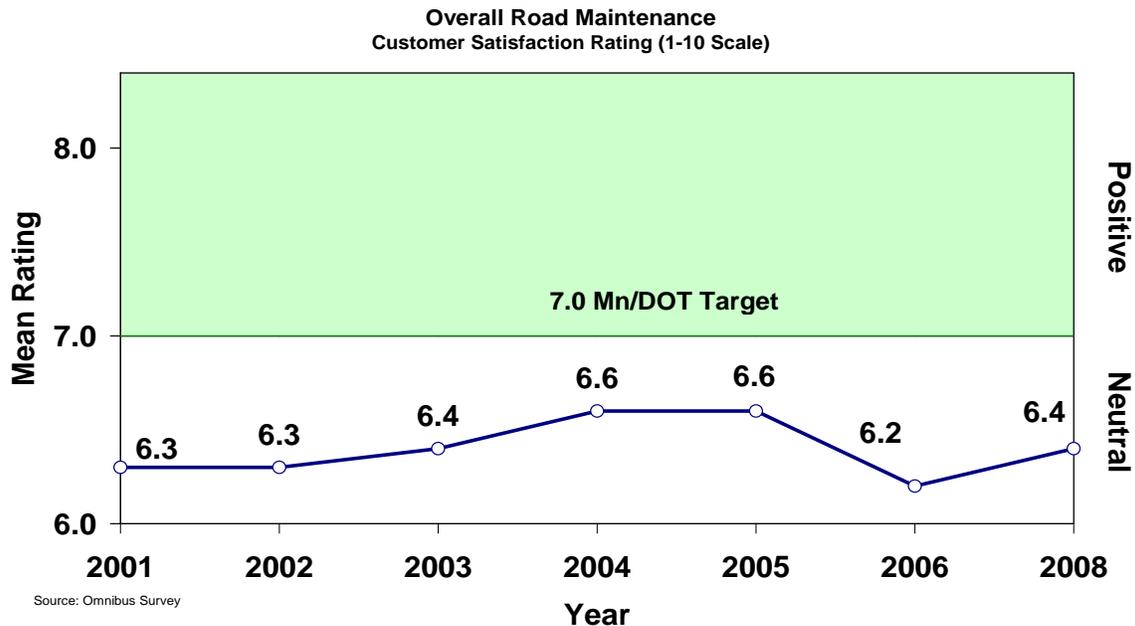
**Relevance/Purpose:** Mn/DOT has conducted an annual Omnibus Study since 1987 (except 2007) to seek the public’s opinion about transportation related projects and the department’s performance of its services and activities.

**Source:** Mn/DOT Omnibus Survey

**Reporting Office:** Mn/DOT Market Research

**Methodology:** The Omnibus Survey is a telephone survey of a representative statewide sample of 800 citizens. Each year customers are asked about their satisfaction with Mn/DOT’s performance on different maintenance measures, one being Overall Road Maintenance, on a 10 point performance scale (1 being low and 10 being high.) Mn/DOT’s performance was rated lowest for the two related areas of "keeping road surfaces smooth and comfortable" and "overall road maintenance." Performance was rated highest in the areas of "making highway signs clearly readable" and "having clean, safe and attractive rest areas."

**Trends through 2008:** Overall road maintenance continues to be rated below the target of 7.0 at 6.4. Since 2002, the mean rating for overall road maintenance has been between 6.2 and 6.6 on a 10-point performance scale. Although the 2008 rating of 6.4 is up slightly from 2006, it is still down significantly from the 6.6 rating in 2004.



## Policy 3 Developmental Measures:

### Road Drainage Infrastructure Maintenance and Repair

Mn/DOT drainage infrastructure includes culverts, storm drains, storm tunnels, ditches, and storm water ponds. These and other water quality treatment devices are required to convey water under roads, drain the road surface and treat the stormwater runoff to meet environmental regulations.

The developmental measure, expected to be fully developed by 2010, tracks the maintenance and repair of highest priority condition 4 (very poor condition) cross culverts – the pipes that go underneath our roadways. Another aspect of developing this measure is conducting periodic inspections. Once developed, the goal will be to annually address a certain percentage of the highest priority condition 4 culverts, and to inspect culverts on a scheduled basis.

The following Inspection Protocol has been established:

- Condition 4 (very poor condition) culverts – Inspected on annual basis
- Condition 3 (poor condition) culverts – Inspected on 2 year cycle
- All other infrastructure – Inspected on 5 year cycle or per MS4 requirements

One more aspect of developing this measure is fully populating, with cross culverts, the drainage management tool “Hydinfra” (drainage database). The Hydinfra database is expected to be fully populated by the end of 2009 and maintained statewide through inspections on a scheduled basis outlined above.

### Guardrail and Median Barrier Repair

Mn/DOT maintains the guardrail and cable median barrier installed on the trunk highway system. Guardrail along the side of the road can help reduce the severity of hitting a fixed object or running off the road in a hazardous location. Cable median barrier on highways with medians has been very successful at reducing or preventing cross-median crashes and thus saving lives.

A pilot measure is under development in the Metro District. Once developed, the goal would be to expand the measure statewide.

### Retro-Reflectivity of Pavement Markings

Mn/DOT will begin to use retro-reflectivity as its measure of all pavement markings. Retro-Reflectivity readings will be taken using both a van and hand held devices. Mn/DOT is currently working with Iowa State University to develop a standard procedure for sampling retro-reflectivity readings using a hand held instrument. These devices will be delivered by the end of 2009.

Mn/DOT will track all retro-reflectivity of markings as measures in milacandelas per square meter per lux. Mn/DOT has adopted minimum performance of 100 mcd/m<sup>2</sup>/lux for a white line and 80 mcd/m<sup>2</sup>/lux for a yellow line. These minimum performance values are used to schedule maintenance or replacement of all long term durable products such as a plural component liquid or preformed polymer tape and used to determine when latex paint can be left beyond expected service life.

**Mn/DOT is also exploring the feasibility of the following maintenance measure:**

**Traffic Signal, Lighting, and ITS Maintenance**

## Policy 4: National and Global Connections

**Maintain and strengthen Minnesota’s strategic multimodal connections to the Upper Midwest, the nation, and the world.**

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### 4.1 Number of Destinations Served by Nonstop Flights from Minnesota

**Indicator:** Nonstop markets served from Minnesota.

**Relevance/Purpose:** Quality air transportation services are a major driver of regional economies. Accessibility of our region to the rest of the world sustains and attracts business operations, generates jobs, and supports tourism and conventions.

The number of international non-stop destinations served by MSP International airports is a measure of our region’s national and global accessibility.

**Source:** Metropolitan Airports Commission Annual Report to the Legislature and the Metropolitan Airports Commission

**Reporting Office:** Mn/DOT Office of Aeronautics

**Methodology:** The Metropolitan Airports Commission tracks the number of domestic and international markets served by non-stop flights. Domestic markets include those receiving an annual average of at least five weekly nonstop flights. International markets include those receiving an annual average of at least one weekly nonstop flight. Some of these markets are served only seasonally. Markets are reported rather than destinations or cities because in some cases multiple airports draw from the same population center. For example, Chicago is home to O’Hare and Midway airports but they are combined to constitute the Chicago market.

**Trends:** MSP offered 144 nonstop markets in 2008, which is unchanged from the number of markets offered in 2007. There were 123 domestic and 21 international markets (nine of these international markets were Canadian).

**Indicator:** Annual number of scheduled commercial airline passengers departing from Minnesota airports

**Relevance/Purpose:** Quality air transportation services are a major driver of regional economies. Accessibility of our region to the rest of the world sustains and attracts business operations, generates jobs, and supports tourism and conventions.

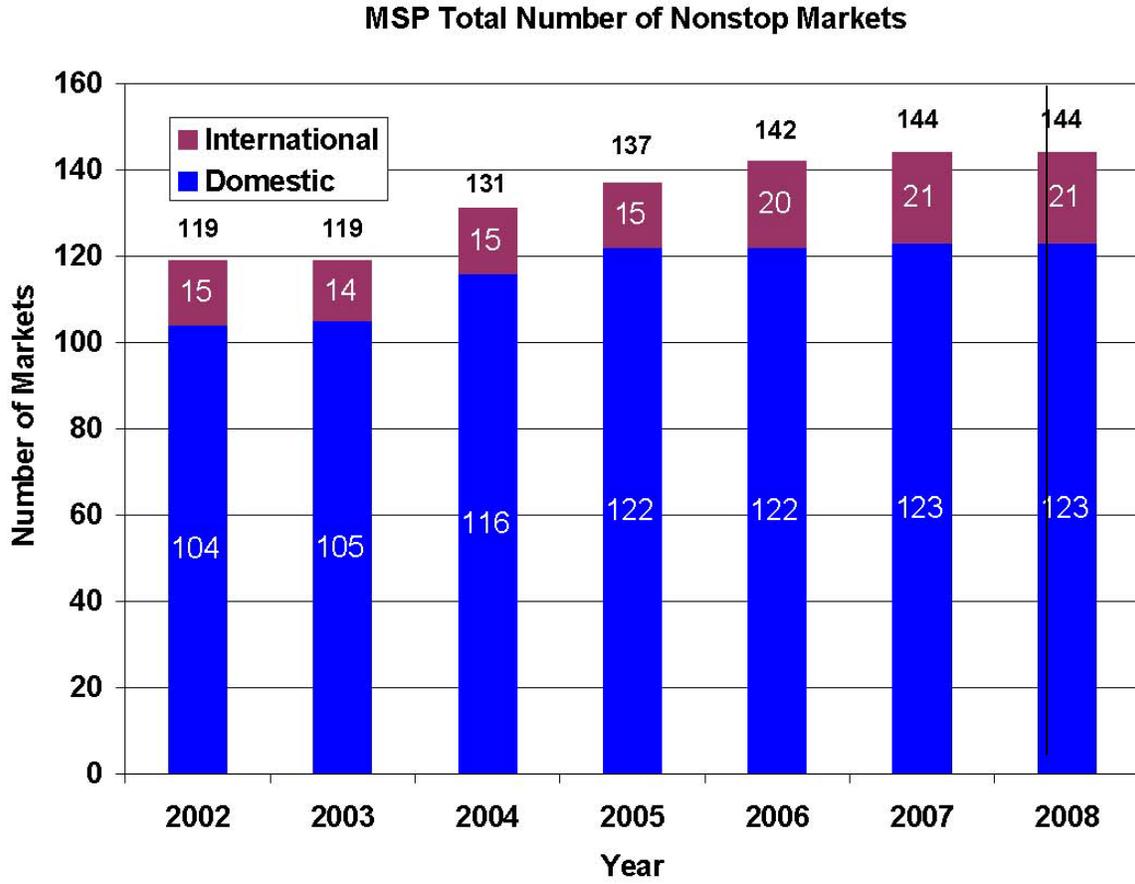
The number of statewide enplanements is a measure of our region’s national and global accessibility.

**Source:** Federal Aviation Administration (FAA)

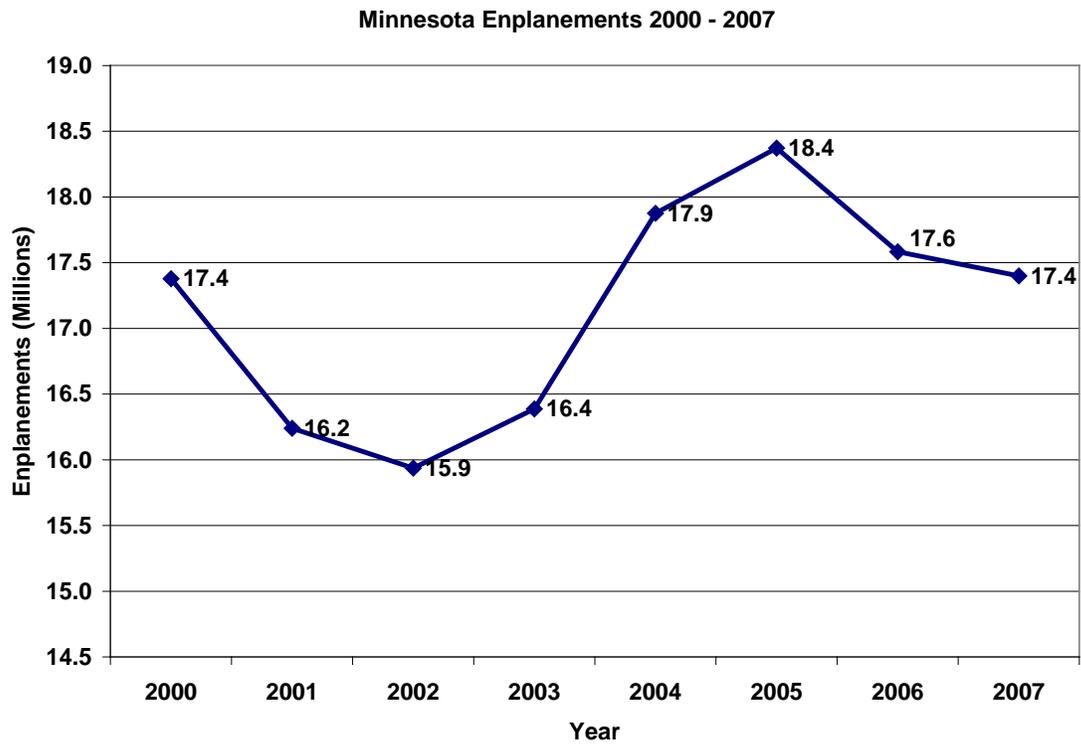
**Reporting Office:** Mn/DOT Office of Aeronautics

**Methodology:** Includes data from MSP and eight regional airports. Enplanement numbers include connecting passengers and charters.

**Trends:**



## 4.2 Minnesota Enplanements



## **Policy 4 Developmental Measures:**

### **Freight Mode by Weight and Value**

Trucks carry the largest proportion of freight in Minnesota; however, the state generally has a relatively high percentage of freight moved by rail and water compared to the rest of the country. Additionally, goods carried by the trucks tend to have higher value-weight ratios than both rail and water. Therefore, trucking carries a higher percentage of the value of the goods shipped in the state than it does the percentage of tonnage shipped. This developmental indicator would build upon the work completed through the 2005 Minnesota Statewide Freight Plan to track the weight and value of freight shipped by mode in Minnesota.

### **Cost of Goods Movement and Transit Time in Key National Modal Corridors**

This measure will track the cost of moving goods and the time of those goods in transit in a number of key gateway corridors. It would consider multiple modes. Examples include barge service to/from New Orleans, container rail service to/from Los Angeles, Chicago, and Seattle and trucking service to and from Chicago.

## **Mn/DOT is also exploring the feasibility of the following national and global connections measures:**

**Regional and Short-line Rail with 286,000 Pound Rating**

**Delays through Minnesota Locks and Dams**

## Policy 5: Statewide Connections

**Enhance the movement of people and freight between regional trade centers (RTC) within Minnesota by providing efficient, multimodal transportation connections.**

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### 5.1 Travel Speed on Greater Minnesota Interregional Corridors (IRC)

**Measure:** Percent of Greater Minnesota Interregional Corridor miles meeting or within 2 MPH of target speed.

**Target:** 100 percent of Greater Minnesota IRCs should perform near or above speed performance targets.

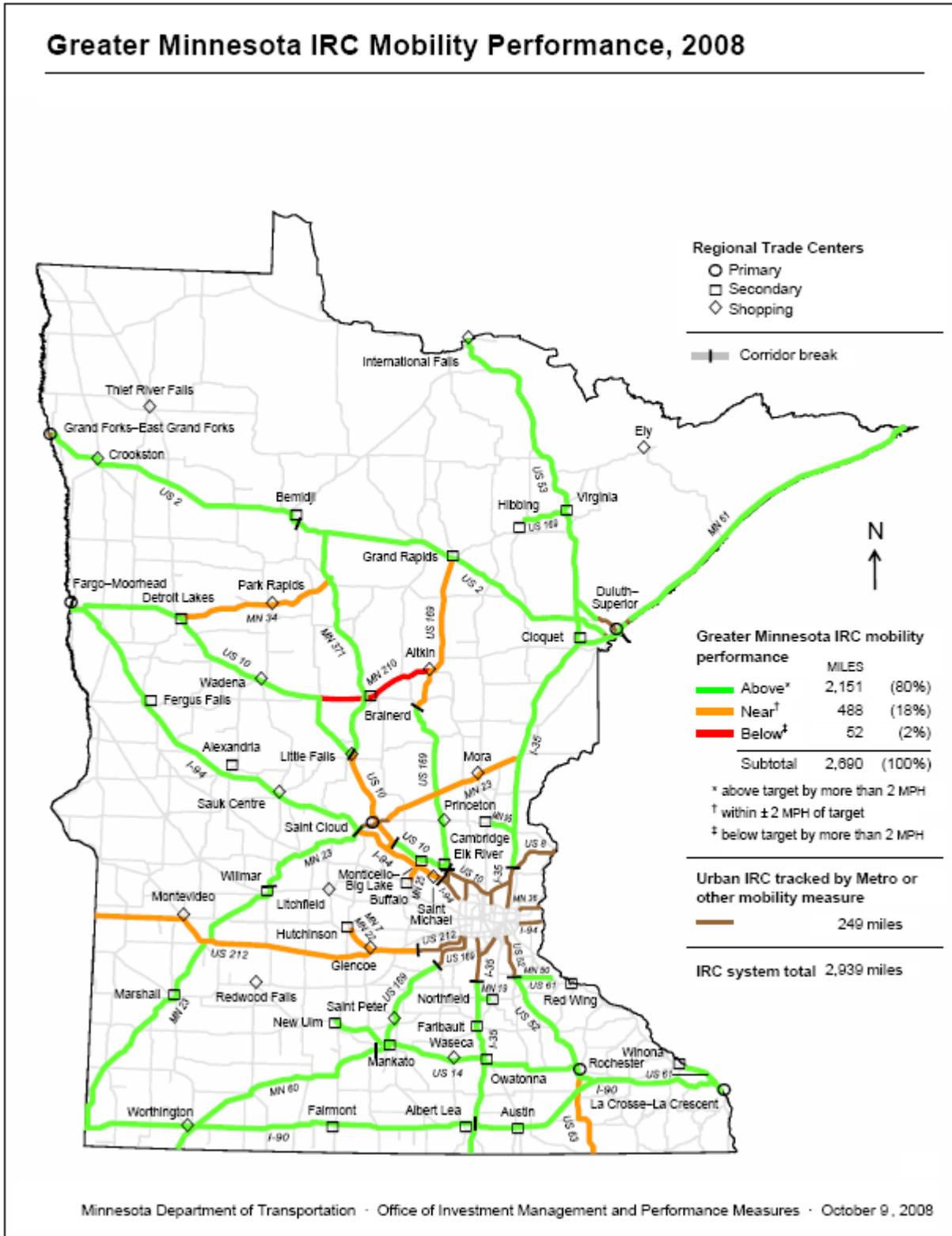
**Relevance/Purpose:** This measure was developed in 2000 as part of the Interregional Corridor Study and was refined in 2008 to address overlapping mobility performance measures within the Twin Cities Metropolitan Area.

**Source:** Mn/DOT Office of Investment Management

**Reporting Office:** Mn/DOT Office of Investment Management

**Methodology:** The IRC measure tracks changes in estimated travel speeds on IRC corridors. Speed estimates are based on posted speed limits, and also take into account delays caused by signals, stop signs, and congestion.

**Trends:** Currently, 98 percent of the Greater Minnesota IRC system performs within 2 miles per hour or above identified speed targets. Based on projected traffic volumes and taking into account highway improvements planned through the 2009 – 2012 STIP, IRC performance is expected to decline to 91 percent performing near or above speed targets by 2028.



IRC performance 2008

## 5.2 Access to Intercity Bus Service

**Measure:** Percent of Level 1 and 2 Regional Trade Centers (RTC) with scheduled intercity bus service.

**Target:** The target is to have scheduled intercity bus service to 100 percent of Level 1 and Level 2 Regional Trade Centers.

**Relevance/Purpose:** This measure and its accompanying target were developed as part of the 2009 Intercity Bus Network Study. Intercity bus service has historically been declining around the nation and also within the state of Minnesota. Three intercity bus carriers currently serve the state: Jefferson Lines, Greyhound, and Megabus. Mn/DOT is working to retain a statewide network and improve service where possible and when funds become available.

**Source:** Mn/DOT Office of Transit

**Reporting Office:** Mn/DOT Office of Transit

**Methodology:** This measure tracks the access to intercity bus service for Minnesota's Level 1 and 2 RTCs.

**Trends:** In 1994, scheduled intercity bus service was available to 94 percent of the state's Level 1 and Level 2 RTCs. In 2009 intercity bus service is available to just 70 percent. The Office of Transit will make this information available on a yearly basis starting in 2009.

### 5.3 Access to Scheduled Air Service

**Measure:** Percent of Minnesota's population within 60 minutes of an airport with scheduled airline service.

**Target:** 90 percent of Minnesota's population should be within 60 minutes of a commercial service airport.

**Relevance/Purpose:** Nine Minnesota airports: Bemidji (BJI), Brainerd (BRD), Duluth (DLH); Hibbing (HIB); International Falls (INL); Minneapolis - St. Paul (MSP); Rochester (RST), St. Cloud (STC), and Thief River Falls (TVF) have scheduled airline service. Airports in neighboring states that serve Grand Forks and Fargo, North Dakota; Sioux Falls, South Dakota; Mason City, Iowa; and La Crosse, Wisconsin, also help to meet Minnesota's commercial airline travel needs. These 14 commercial airports are within a one hour travel time for 86 percent of Minnesota's population.

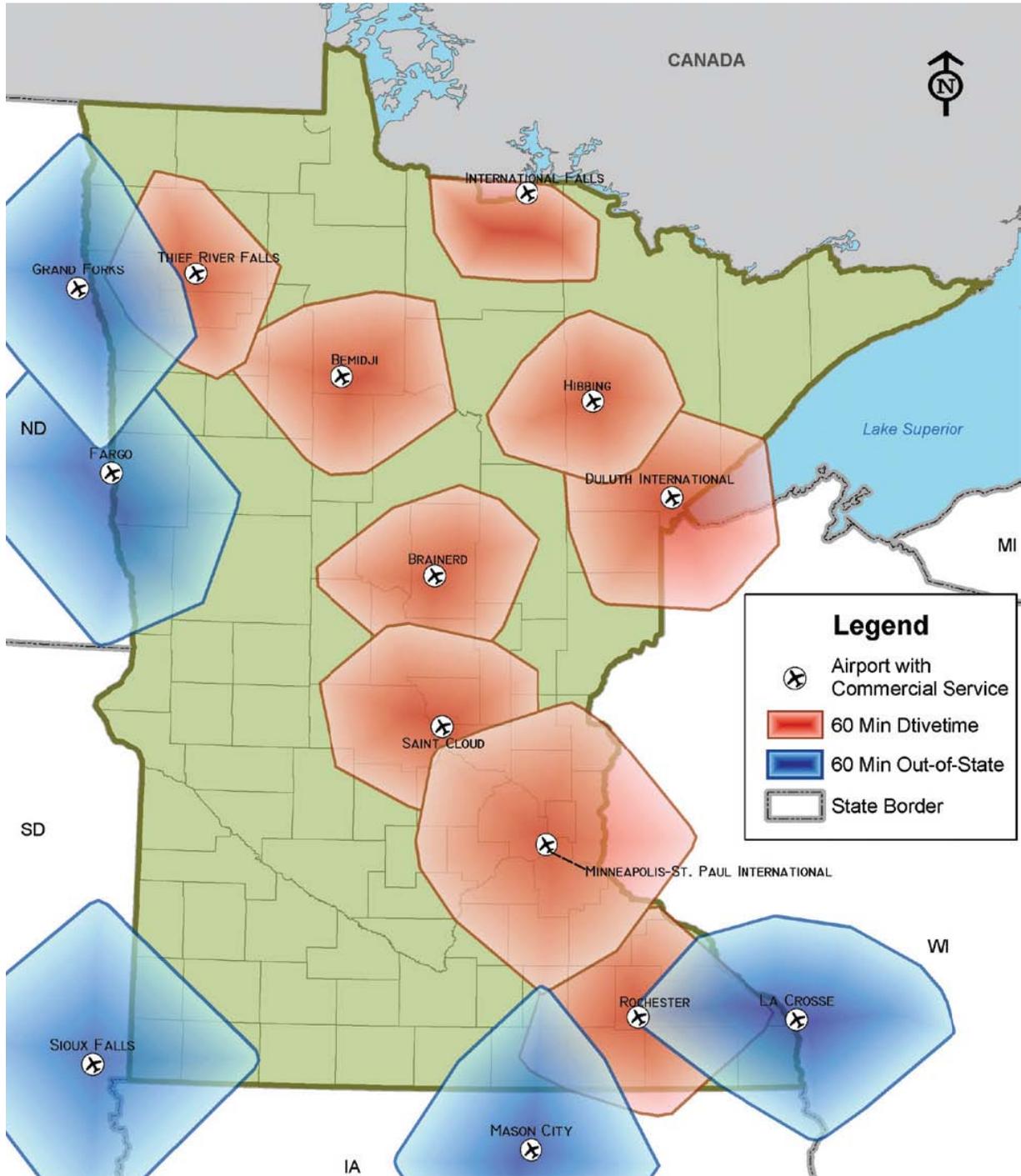
**Source:** 2006 State Aviation System Plan

**Reporting Office:** Mn/DOT Office of Aeronautics

**Methodology:** Mn/DOT's Office of Aeronautics will track and report changes in the percent of the state population within 60 minutes of an airport with scheduled airline service.

**Trends:** Mn/DOT and Minnesota communities and airports have a limited influence on how and where commercial airline service is provided. Nevertheless, several communities are actively pursuing air service to their airports. Given the current economic situation and fluctuations in the air service industry, it does not appear that any additional airports in Minnesota will secure scheduled commercial airline service in the near term. However, as the percentage of population increases in urban areas, it is expected that performance levels will increase over time.

**Population within 60 minutes of Airports with Scheduled Airline Service**



#### **5.4 Access to Airports with a Paved and Lighted Runway**

**Measure:** Percent of Minnesota population within 20 miles of an airport with a paved and lighted runway.

**Target:** 90 percent of Minnesota's population should be within 20 miles.

**Relevance/Purpose:** The state air transportation system serves the air transportation needs of the people of Minnesota, providing them with convenient access to the state, national and international air transportation systems. It serves corporate and business travelers, tourism and personal and recreational flying. It also supports medical and emergency services such as the state patrol, aerial fire fighters, the Civil Air Patrol, and local law enforcement. In other words, the system supports virtually all Minnesotans. Most recognizable to the general public are the air carriers including air charter providers, corporate aircraft, and airlines such as Northwest/Delta Airlines, Mesaba Airlines, and Sun Country Air Lines. Delivery services like UPS, FedEx, DHL, and the US Postal Service, which serve shippers distributing packages to local, national, or international destinations also use these airports.

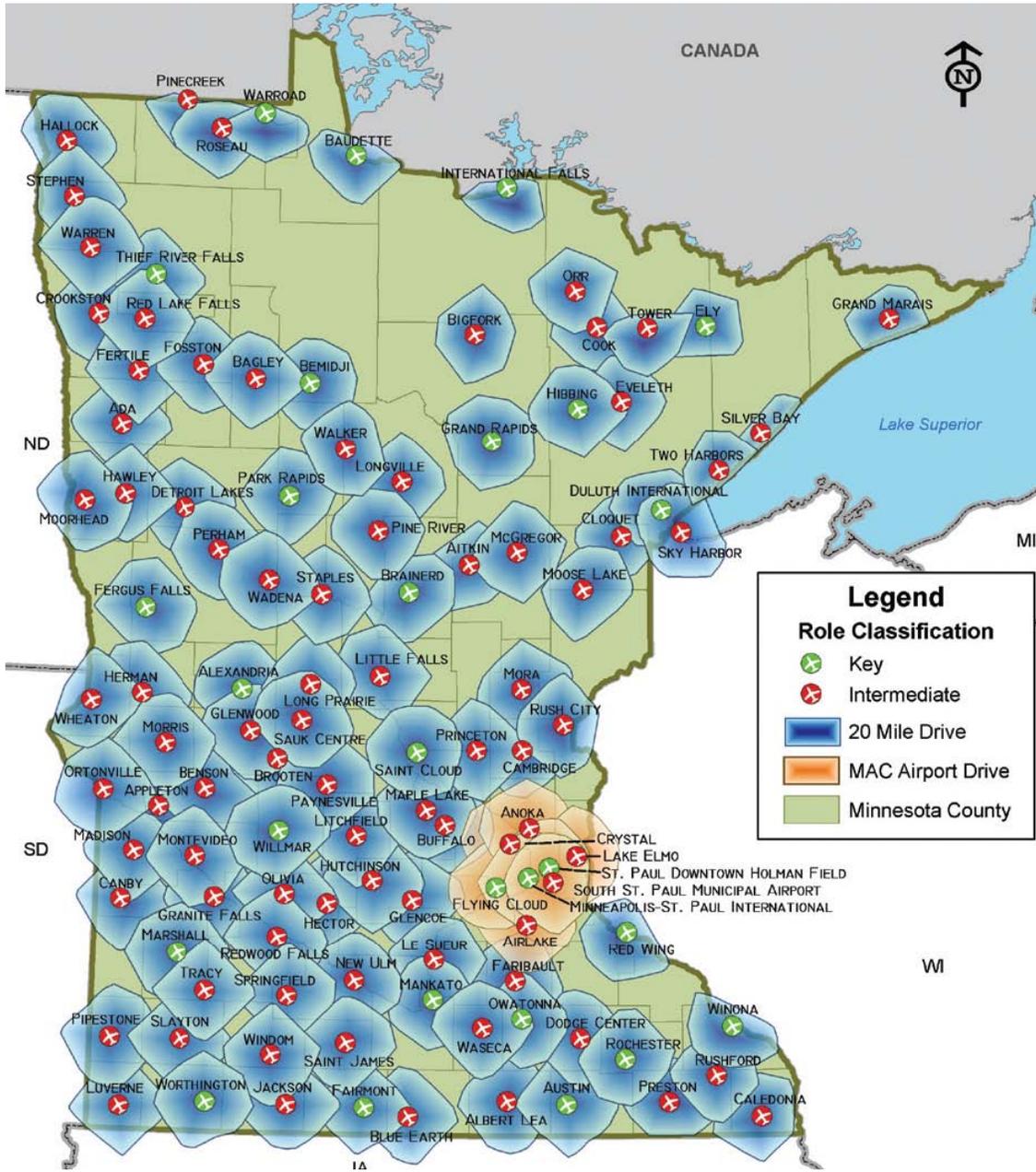
**Source:** 2006 State Aviation System Plan

**Reporting Office:** Mn/DOT Office of Aeronautics

**Methodology:** The data was first collected in 2006 and will be updated every five years. A special consultant study is funded to do the measurement; hence data is not updated annually.

**Trends:** 6 percent of Minnesota's population is within 20 miles of a public airport with paved and lighted runway. While the same measure was not used in the past, the number of airports with paved and lighted runways increased from 109 in 1999 to 111 in 2006.

Population within 20 miles of airports with paved and lighted runways



## 5.5 Airports with Reported Cargo Service

**Measure:** Percent of Minnesota population within 60 minutes of an airport with cargo activity.

**Target:** 90 percent of Minnesota's population should be within 60 minutes of an airport with scheduled cargo service; 95 percent of Minnesota's population should be within 60 minutes of an airport with some type of cargo service, including intermittent or on-demand service.

**Relevance/Purpose:** Convenient access to nearby air cargo service, whether it be regular scheduled service, or on-demand service, is an important benefit for Minnesota businesses receiving inventory or supplies, or shipping time-sensitive products around the nation or the world. Proximity to regular cargo service can be an important factor in manufacturers or other businesses choosing where to locate.

**Source:** 2006 State Aviation System Plan

**Reporting Office:** Mn/DOT Office of Aeronautics

**Methodology:** For this measure, population was used as a proxy for business activity. Mn/DOT and the Minnesota airports have limited ability to influence where air cargo service is provided. The measurement is done by a consultant special study and hence is not updated annually.

**Trends:** 36 airports report either scheduled or on-demand air cargo service. 88 percent of Minnesota's population is within 60 minutes of an airport with scheduled cargo service; 97 percent of Minnesota's population is within 60 minutes of an airport with some type of cargo service. Reported performance for this measure would increase if out-of state airports were considered in the analysis, possibly reaching the 90 percent target.

**Population within 60 Minutes of an Airport with Some Type of Air Cargo Activity**



**Policy 5 Developmental Measures:**

**Mn/DOT is exploring the feasibility of the following statewide connections measure:**

**Access to Intercity Rail Service**

## Policy 6: Travel within the Twin Cities Metro Area

Provide mobility and address congestion in the Twin Cities by optimizing use of the existing system and making strategic capacity investments in both highways and transit.

### 6.1 Travel Time Index (TTI) and National Ranking

**Indicator:** Twin Cities' ranking among metropolitan areas for peak to off-peak travel times.

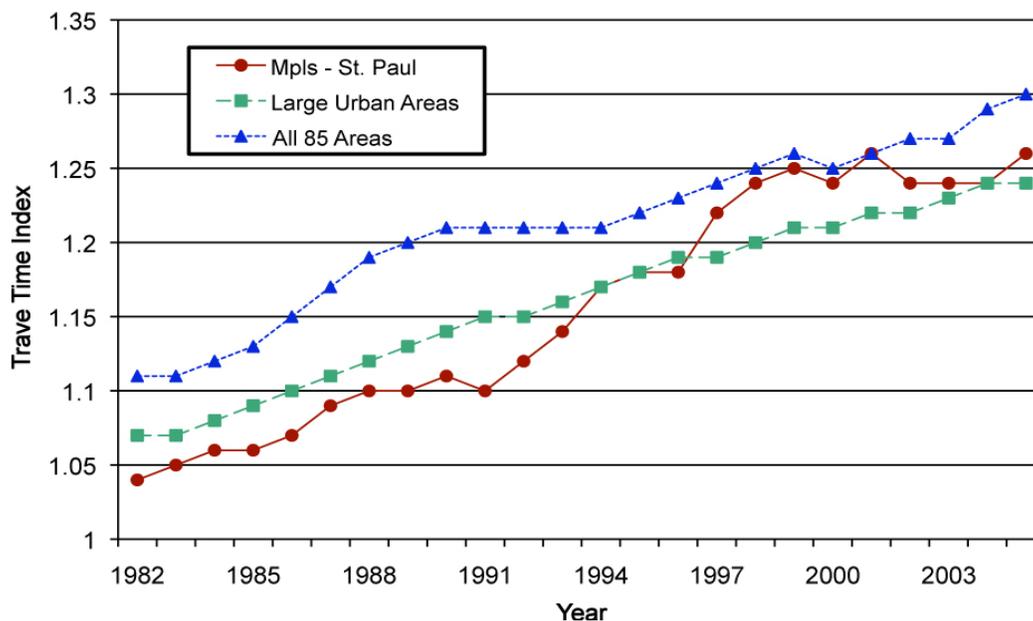
**Relevance/Purpose:** The Travel Time Index (TTI) and corresponding national ranking are performance indicators developed by the Texas Transportation Institute at Texas A&M University. Data is available for the indicator beginning with 1982. The Travel Time Index is, “the ratio of the travel time during the peak period to the time required to make the same trip at free-flow speeds. A value of 1.3, for example, indicates a 20-minute free-flow trip requires 26 minutes during the peak period.”

**Source:** Texas Transportation Institute

**Reporting Office:** Mn/DOT Regional Transportation Management Center

**Methodology:** Since 1982, the Texas Transportation Institute has been analyzing and reporting on urban congestion. As part of this effort, the institute reports the TTI for major metropolitan areas (those 85 areas with populations greater than 500,000) across the country. Mn/DOT will continue to use this information for reporting on congestion in the Twin Cities region as compared to other metropolitan areas.

**Trends through 2005:** The figure below illustrates the Travel Time Index for the Twin Cities Metropolitan Area. From 1982 through 2005 the index increased from 1.04 to 1.26. The national ranking for the TCMA changed from 51st out of 85 cities in 1983 to 26th in 2005.



## 6.2 Duration and Extent of Congestion on Freeways

**Measure:** Percent of freeway miles congested in weekday peak periods.

**Target:** A target will be developed in the Metro Highway System Investment Strategy.

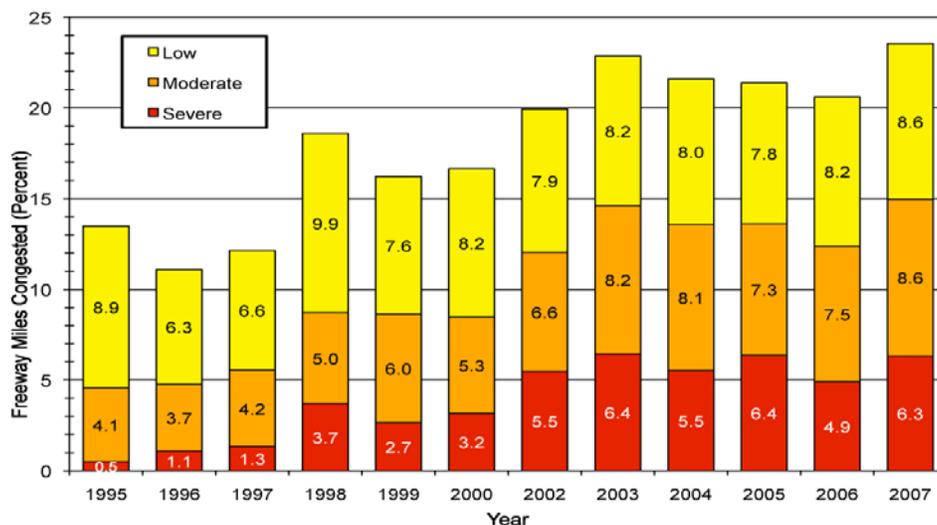
**Relevance/Purpose:** Operating the system at or above 45 mph will provide the maximum vehicle throughput. Therefore, allowing links on the system to degrade below 45 mph will reduce its overall carrying capacity and the system will be less efficient (carry fewer vehicles per hour).

**Source:** Mn/DOT Regional Transportation Management Center

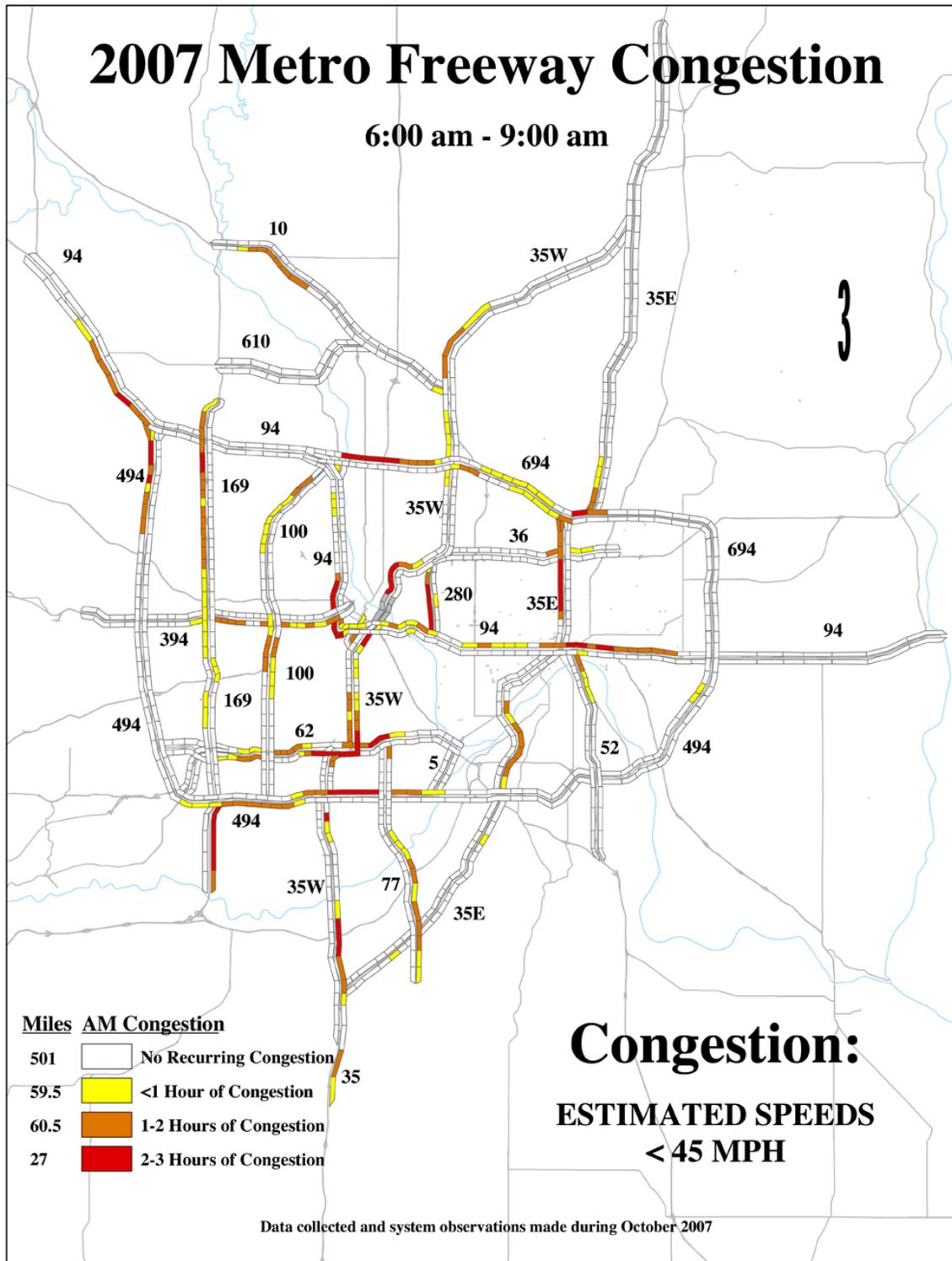
**Reporting Office:** Mn/DOT Regional Transportation Management Center

**Methodology:** This indicator of freeway performance identifies the location and the duration of congestion on the Metropolitan Freeway System in half-mile increments. Freeway congestion is defined as operating speeds below 45 miles per hour for one hour or more during peak periods. Operating the system at or above 45 mph will provide the maximum vehicle throughput. Therefore, allowing links on the system to degrade below 45 mph will reduce its overall carrying capacity and the system will be less efficient (carry fewer vehicles per hour).

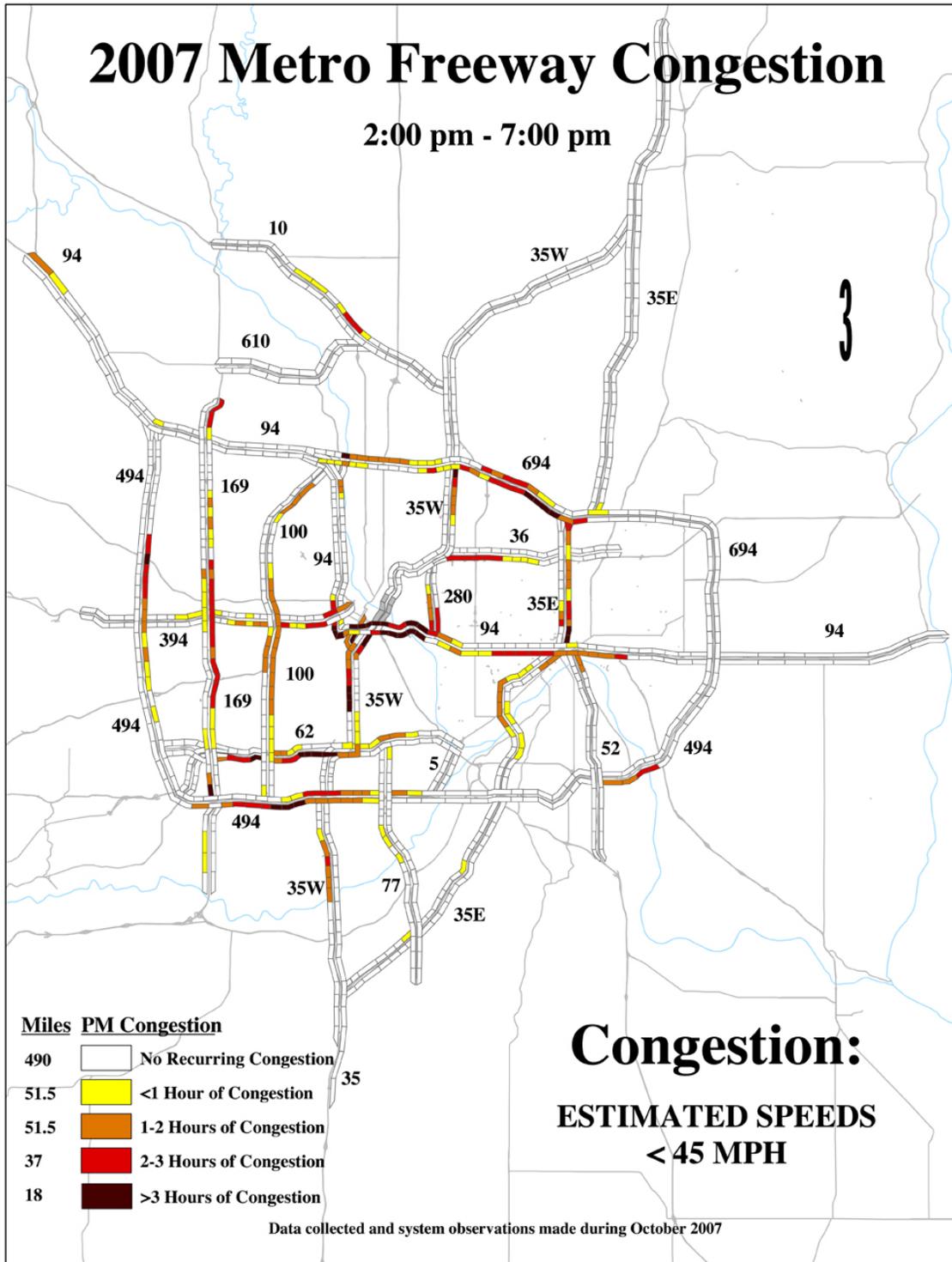
**Trends through 2008:** In 2008, the Twin Cities freeways saw a substantial drop in congestion, from 20.9 percent in 2007 to 17.3 percent. A significant part of this change was attributed to the completion of the Interstate 35W Bridge over the Mississippi River. However, this drop was also large enough to improve upon the 2006 value of 18.3 percent, before the collapse of the Interstate 35W Bridge. Excluding 2007, congestion has dropped each year since 2004. This short term trend is largely credited to the completion of large construction projects and, most recently, a decline in Vehicle Miles Traveled (VMT). It is expected that, in the next few years, congestion will plateau or continue to decline as current and planned projects are completed. However, future plans include fewer capacity-adding projects. Mn/DOT expects this will lead to a long run trend of growing congestion.



Duration and Extent of TCMA Congestion, AM Peak Period



Duration and Extent of TCMA Congestion, PM Peak Period



### 6.3 Transit Ridership

**Measure:** Passengers Served in the Twin Cities Region.

**Target:** According to the Metropolitan Council 2030 Transportation Policy Plan, the target for the measure is to double 2003 transit ridership to 150 million rides by the year 2030.

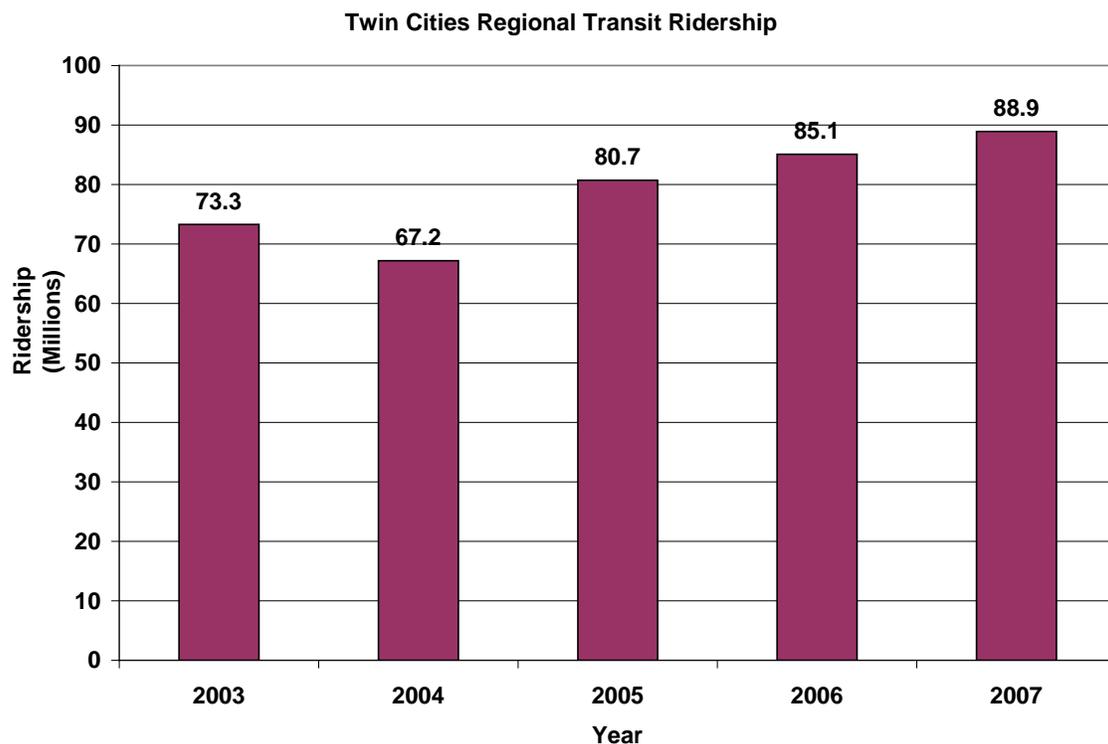
**Relevance/Purpose:** Improved transit can provide alternatives to traveling by car and may help improve the efficiency of the regional transportation system.

**Source:** Metropolitan Council 2030 Transportation Policy Plan

**Reporting Office:** Mn/DOT Office of Transit

**Methodology:** This performance measure tracks the number of people carried annually on transit throughout the TCMA. The measure aggregates ridership for all transit systems operating within the region, including Metro Transit bus and rail, Metro Mobility, contracted regular route service, suburban transit providers, vanpools, dial-a-ride, Northstar commuter service, and the University of Minnesota.

**Trends through 2007:** Ridership has increased by 15 percent since 2003. Ridership in 2004 was down, however, due to a 44 day transit strike.



### 6.4 Bus-Only Shoulders

**Measure:** Miles of Bus-Only Shoulders.

**Target:** Establish 4 to 8 miles of bus shoulder in the metropolitan area per year.

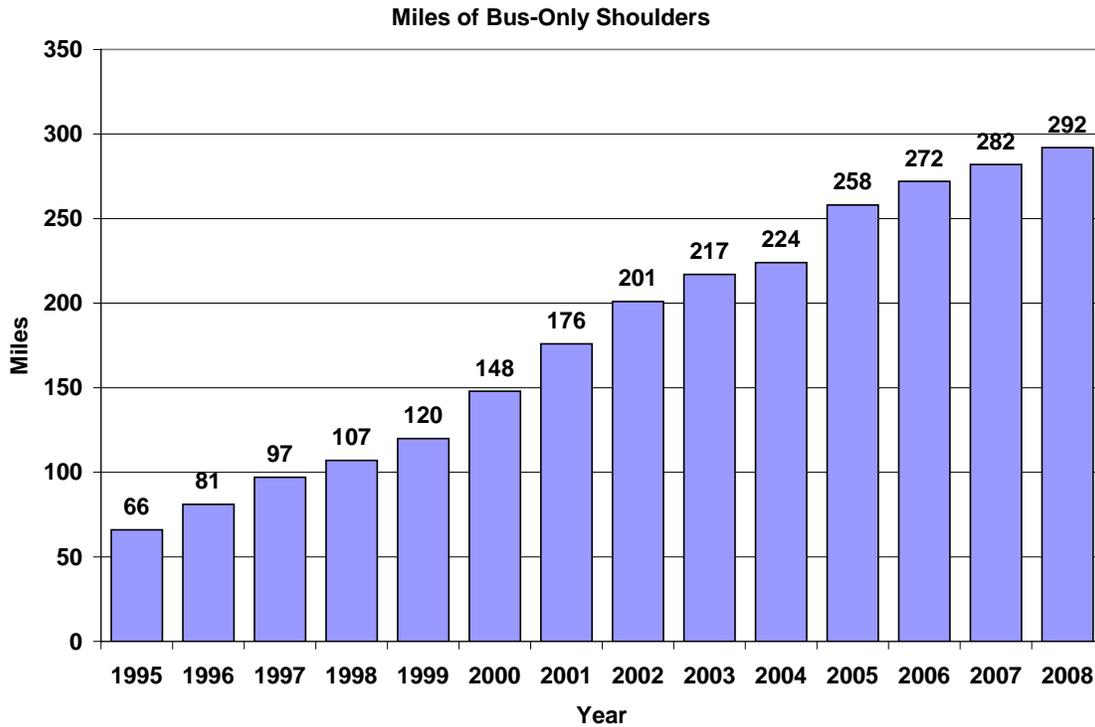
**Relevance/Purpose:** The objective is to provide transit advantages for buses in congested areas where travel speeds may be low.

**Source:** Metro Division Planning Office – Team Transit

**Reporting Office:** Mn/DOT Metro District

**Methodology:** This performance indicator tracks the number of miles bus only shoulders within the Twin Cities Metropolitan Area.

**Trends:** The number of bus-only shoulder miles has increased each year for more than a decade.



## 6.5 Incident Clearance

**Measure:** Average clearance time for urban freeway incidents.

**Target:** The target time for clearance of urban freeway incidents is 35 minutes.

**Relevance/Purpose:** Incidents include anything that disrupts the normal flow of traffic such as stalled cars, accidents and objects that have fallen on the roadway. Response may require FIRST response and/or the dispatch of tow trucks, police or highway patrol personnel, medical help, road maintenance crews, HazMat teams, or other emergency services to address the incident and clear the road and restore it to full capacity.

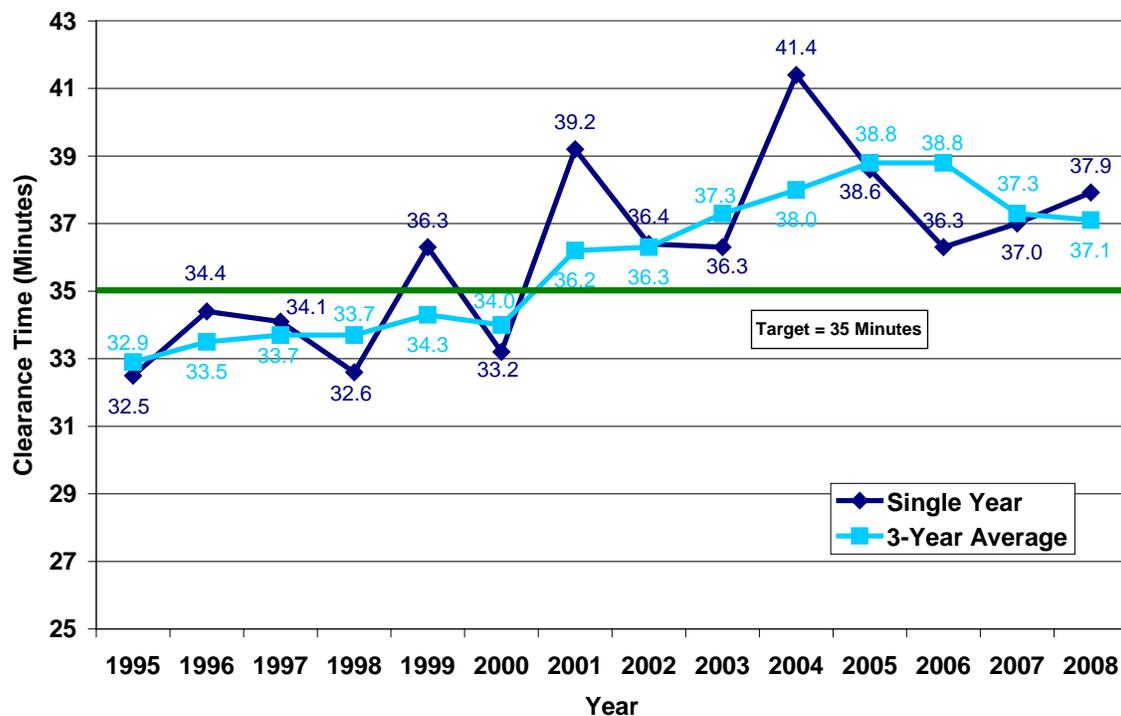
**Source:** Mn/DOT Regional Transportation Management Center

**Reporting Office:** Mn/DOT Regional Transportation Management Center

**Methodology:** The measure tracks the time (in minutes) it takes Mn/DOT and its partners to clear incidents on the Metro Area freeway system - including stalled cars, crashes, and other events or objects that disrupt normal traffic flow.

**Trends:** In 2008 average time to clear incidents was reduced slightly to 37.1 minutes, in part a result of increased FIRST truck staffing and new computer-aided dispatching.

**Clearance Time for Urban Freeway Incidents**



### 6.6 Metro Signal Retiming on Arterial Routes

**Measure:** Signal Retiming Frequency.

**Target:** 4 year average retiming cycle

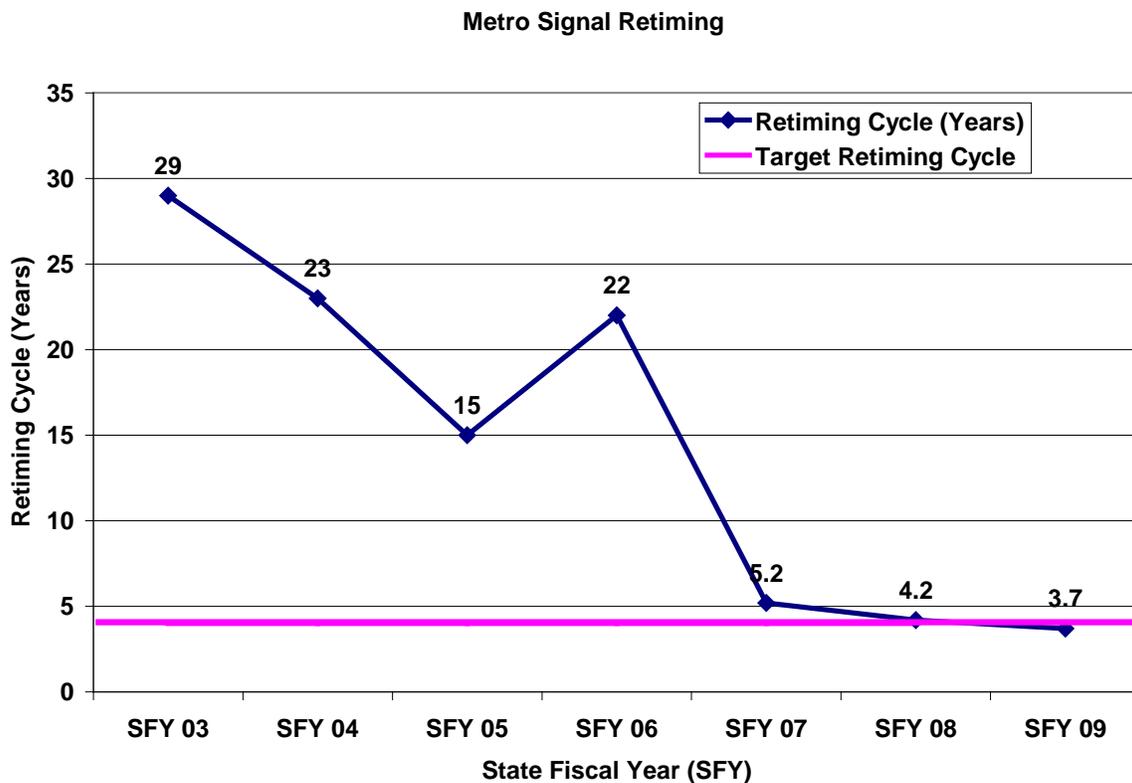
**Relevance/Purpose:** Mn/DOT maintains approximately 660 signals on the state highway system in the Twin Cities Metropolitan Area. One of Mn/DOT’s responsibilities is to manage these signalized intersections so that they efficiently and safely move traffic. Growth in the Twin Cities Metropolitan Area results in change in traffic demands. Conducting signal retiming studies is an important part of ensuring responsiveness to these changing traffic patterns and demands. National studies have noted significant user benefits including reduction in delay and travel time, and savings in fuel usage as a result of signal retiming studies.

**Source:** Metro District Traffic

**Reporting Office:** Metro District Traffic

**Methodology:** Metro District tracks how many signals are retimed per year and calculates the average retiming cycle of its signals.

**Trends through State Fiscal Year (SFY) 2009:** The following chart shows the actual retiming cycle from SFY 2003 to SFY 2009 and the target frequency of 4 years.



## 6.7 FIRST Route Coverage

**Indicator:** Total miles covered by the Freeway Incident Response Safety Team (FIRST).

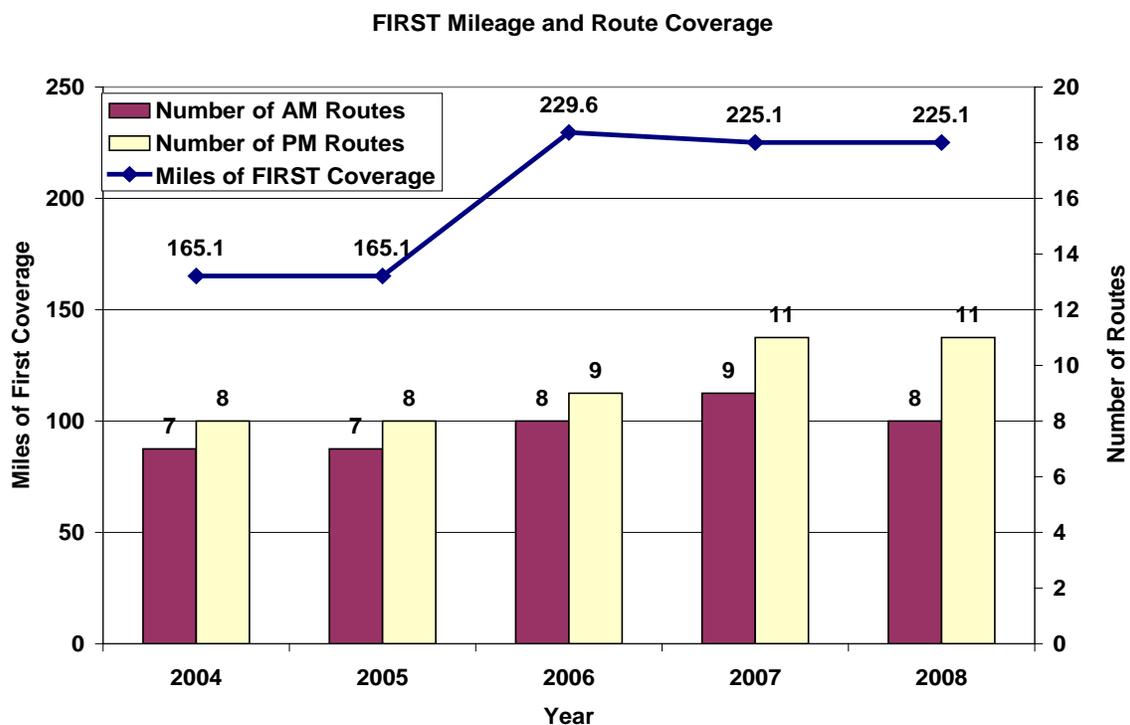
**Relevance/Purpose:** High traffic volumes and speeds on instrumented principal arterial routes make it hazardous for users who are trapped along the shoulder of the road, with mechanical or other problems, and for those who are involved in traffic incidents. The primary purpose of the FIRST program is to minimize congestion along these routes and prevent secondary crashes through the quick response and removal of incidents. A secondary benefit to the program is aid to stranded motorists.

**Source:** Mn/DOT Regional Transportation Management Center

**Reporting Office:** Mn/DOT Regional Transportation Management Center

**Methodology:** The number of miles covered by FIRST is subject to a number of variables including staff availability<sup>1</sup>, frequency of patrols on certain routes<sup>2</sup>, addition and removal of routes<sup>3</sup>, and route overlap<sup>4</sup>.

**Trends through 2008:** The chart identifies the total miles covered by FIRST since 2004 when fully staffed as well as the number of routes covered in the AM and PM peak driving periods.



<sup>1</sup> When fully staffed there are currently 9 drivers for the AM peak and 11 drivers for the PM peak

<sup>2</sup> Routes with recurring problems and/or incidents are often patrolled with greater frequency

<sup>3</sup> In 2006, parts of two routes were contracted out with construction projects: I-494 from 394 to 62 and the Wacouta Bridge project (which covered an additional 13.6 miles).

<sup>4</sup> In 2008 an additional route was allocated in the 35W/Highway 62 construction project creating coverage overlap. This overlap does not result in additional measured miles of FIRST coverage.

## 6.8 Instrumented Principal Arterial Routes

**Measure:** Number of miles of instrumented principal arterial routes.

**Target:** There is no target associated with this measure.

**Relevance/Purpose:** This purpose of this measure is to track the ability to identify and communicate problems on the principal arterial system. Cameras and vehicle detectors are used to collect information and relay it to the Regional Transportation Management Center (RTMC). Principal arterial routes equipped as such are considered instrumented. Instrumentation allows the RTMC to monitor, manage and help direct responses to incidents as well as manage traffic demands in the Metropolitan area.

**Source:** Metro District Traffic and Metro District Planning

**Reporting Office:** Mn/DOT Regional Transportation Management Center

**Methodology:** This measure is calculated as the number of principal arterial miles of road in the Metropolitan area instrumented with cameras and pavement sensors.

**Trends:** There are currently 381 miles of instrumented principal arterials in the Twin Cities Metropolitan area. The number of instrumented miles will be tracked annually beginning in 2009.

## 6.9 Regional Park-and-Ride Spaces

**Indicator:** Number of park-and-ride spaces in the Twin Cities region.

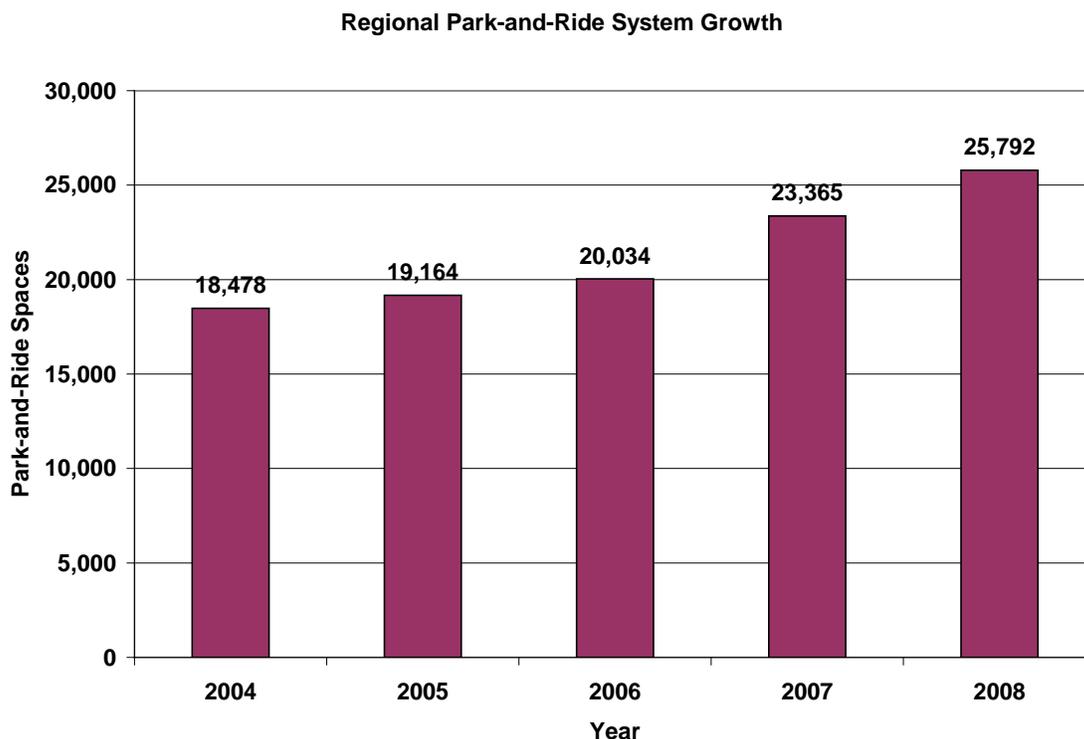
**Relevance/Purpose:** Park-and-ride spaces are located in park-and-ride lots where commuters generally park their vehicle and then connect with public transportation or carpools for the remainder of their journey to work. Although the number and capacity of park-and-ride facilities in the Twin Cities region is constantly in flux, an annual inventory of the number of spaces available is critical to the planning for the park-and-ride system.

**Source:** Metro Transit Annual Regional Park-and-Ride System Survey Report

**Reporting Office:** Metropolitan Council

**Methodology:** The number of park-and-ride spaces in the Twin Cities regional park-and-ride system is tracked as part of an annual park-and-ride system survey. Metro Transit conducts the annual survey each fall in coordination with Mn/DOT and other transportation providers.

**Trends through 2008:** In 2008 the system increased by almost 2,500 spaces and since 2004 the system has increased by almost 7,500 spaces. Park-and-ride usage also increased significantly during this timeframe.



## **Policy 6 Developmental Measures:**

### **Person Throughput**

This indicator is in its initial stages of development. Mn/DOT will work with the Metropolitan Council and other transportation agencies and expect to develop this measure by the end of 2010. The measure is intended to provide for evaluation of various options for transportation and mobility improvements on a corridor basis. One of the strengths of this measure is that it can be used to compare modal alternatives.

### **Mn/DOT is also exploring the feasibility of the following Twin Cities travel measures:**

**Duration and Extent of Congestion on Arterials**

**Arterial and Freeway Travel Time Reliability**

**Vehicle Throughput**

**Metro Area Delay Estimates for Freight**

## Policy 7: Greater Minnesota Metropolitan and Regional Mobility

**Provide for the changing transportation needs of people and freight traveling within Greater Minnesota regions and metropolitan areas by planning regionally for critical investments and improving coordination across modes and jurisdictions.**

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### 7.1 Congestion in Regional Trade Centers

**Measure:** Number of Principal Arterial miles within Level 1, 2, and 3 Regional Trade Centers with a volume-to-capacity ratio greater than 0.85.

**Target:** No specific performance target for congestion has been established. The goal is to minimize congestion in Greater Minnesota.

**Relevance/Purpose:** Travel times for people and freight within Greater Minnesota urban centers are related to levels of recurring congestion. This performance indicator identifies a roadway corridor as warranting consideration for improvements when the forecasted traffic volumes no longer provide satisfactory mobility, or when the road's Level of Service (LOS) falls below D.

**Source:** Mn/DOT Office of Investment Management

**Reporting Office:** Mn/DOT Office of Investment Management

**Methodology:** A roadway corridor is "congested" and warrants consideration for improvements when the forecasted traffic volume (Annual Average Daily Traffic - AADT) no longer provides satisfactory mobility or when the Level of Service falls below D. Level of Service is a concept used to describe the mobility of a roadway and is defined by the Transportation Research Board's *Highway Capacity Manual*. The traffic volume thresholds presented below have been established to indicate when an urban roadway is likely congested and drivers likely experience LOS E.

Roadway Type	AADT Congestion Threshold (vehicles per day)
2-lane Arterial	15,000
4-lane Arterial/Expressway	30,000
4-lane Freeway	75,000
6-lane Freeway	115,000
8-lane Freeway	155,000

**Trends:** This will be tracked beginning with year 2007 traffic volume data and reported annually thereafter. Currently, there are 16 Principal Arterial Miles within Level 1, 2, and 3 Regional Trade Centers with a volume-to-capacity ratio greater than 0.85.

## 7.2 Greater Minnesota Public Transit Bus Service Hours

**Measure:** Total number of public transit bus services hours provided compared to the total number of hours needed to meet transit demand.

**Target:** 1.30 Million Hours in 2008 (80 percent of the demand met)

**Relevance/Purpose:** Measures how well Minnesota is meeting rural transit demand in Greater Minnesota. This is based on the total number of bus service hours provided compared to the total number of hours needed to meet transit demand. Local agencies (e.g., cities, counties, and regional authorities) provide regularly scheduled bus service or dial-a-ride services where customers call to arrange for a small bus or van to pick them up and take them to their local destination. Mn/DOT contributes funds to local agencies for development and operation of these systems. Due to an aging population and other growing segments of transit dependent users additional service is needed to provide transit access in Greater Minnesota.

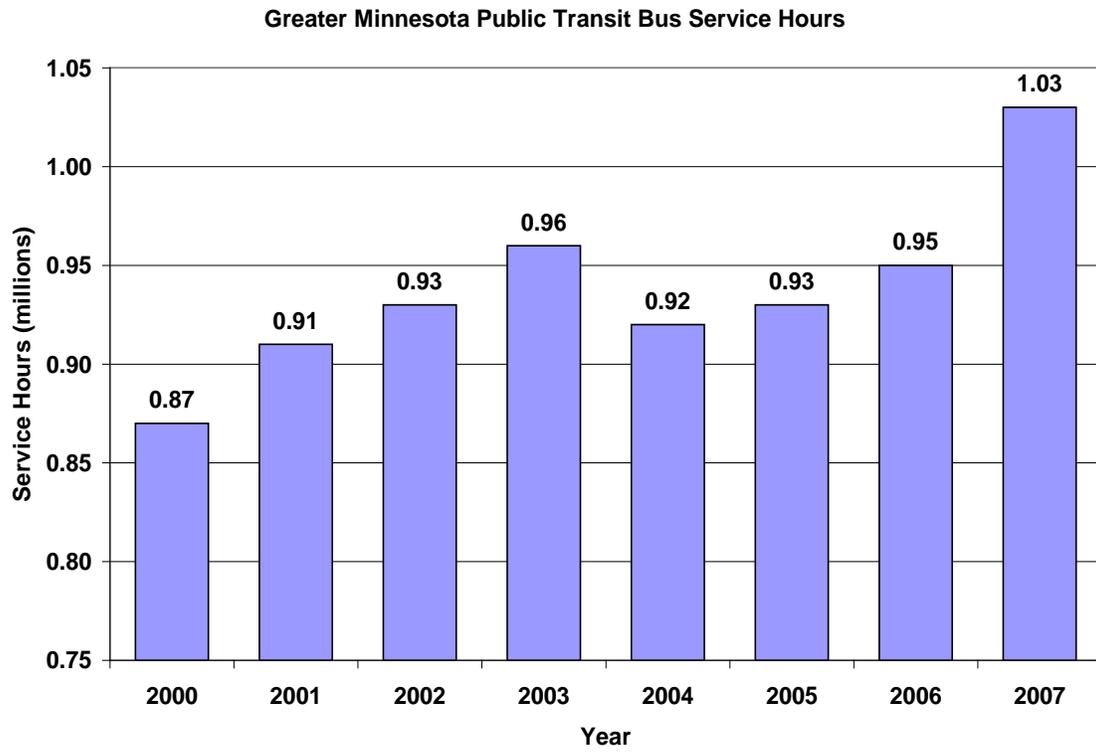
**Source:** Mn/DOT Office of Transit

**Reporting Office:** Mn/DOT Office of Transit

**Methodology:** Measures the total public transit bus service hours provided compared to the total hours required to meet transit demand. Demand is calculated by demographic factors of population groups likely to need transit. Local transit operators sponsored by cities, counties, or regional authorities provide regularly-scheduled bus service or dial-a-ride services.

**Trends through 2007:** Intermittent progress has been made since 2000. Due to a change from increasing revenues to declining revenues, previously projected increases in service levels for 2008 to 2012 have been replaced by a flat projection holding at the 2007 level.

While this measure has been in existence for some time, the Greater Minnesota Transit planning process is presently updating the methodology on which measurement of performance is based. Performance characteristics will again become available upon completion of the Greater Minnesota Transit Plan.



### 7.3 Greater Minnesota Transit Coverage

**Measure:** Number of counties in Greater Minnesota with county-wide transit service.

**Target:** 80 Greater Minnesota counties

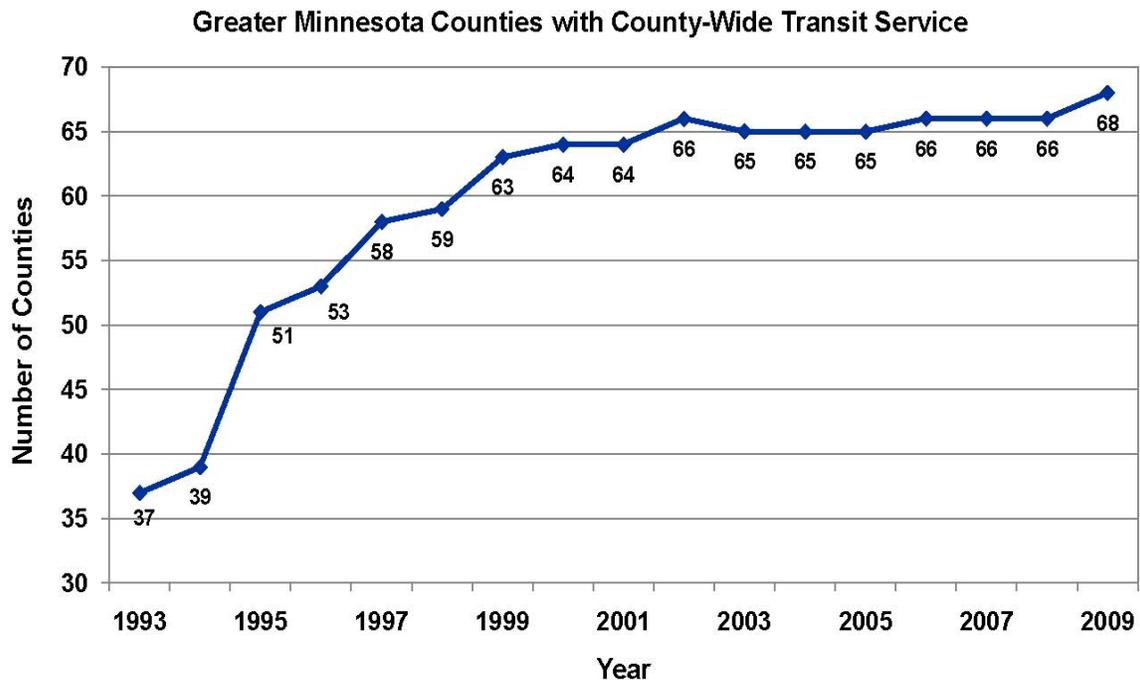
**Relevance/Purpose:** This measure tracks the progress the state of Minnesota is making towards having 100 percent county-wide geographic transit system coverage in the state. This measure fits well within Mn/DOT’s strategic vision for transit. Mn/DOT’s investment priorities are to maintain existing public transit service, provide funding for places without existing transit service, and then provide funding to expand frequencies and reach of existing transit systems.

**Source:** Mn/DOT Office of Transit

**Reporting Office:** Mn/DOT Office of Transit

**Methodology:** County-wide transit service coverage is calculated by the Office of Transit based on the number of transit systems under contract.

**Trends through 2008:** The number of counties served has remained constant over the past three years. Todd and Kanabec Counties added service in 2009.



## 7.4 Non-Auto Commuter Trips

**Indicator:** Percent of Minnesota workers commuting by a mode other than automobile.

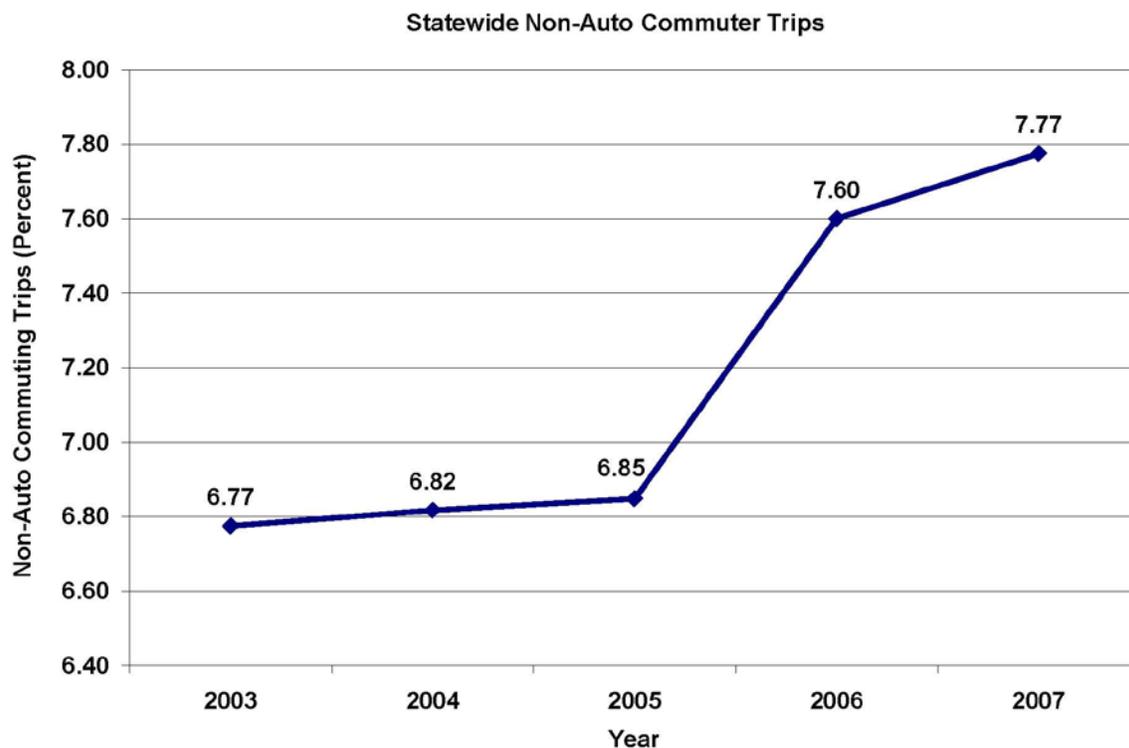
**Relevance/Purpose:** The number and percentage of users who choose transportation options other than the automobile indicate whether the services provided are competitive and whether commuters view these services as reasonable alternatives to auto travel. The United States Census Bureau reports non-auto journey-to-work trips to a degree through the annual American Community Survey. This is also tracked more comprehensively in the decennial census.

**Source:** American Community Survey, U.S. Census Bureau

**Reporting Office:** Mn/DOT Office of Investment Management

**Methodology:** The percent of Minnesotan's above the age of 16 using alternate modes of transportation for their work commute is derived from annual estimates prepared by the U.S. Census Bureau via data gathered by the annual American Community Survey. Participants are asked to identify how they usually got to work the previous week. If the respondent used more than one mode, they are instructed to select the mode used to travel the greatest distance. This indicator presents the percent of respondents who selected public transportation, bicycle, walking, taxicab, motorcycle or other as their means of transport to work. It does not include those who work at home.

**Trends:** The percent of Minnesotans commuting by a mode other than the automobile increased by one percent between 2003 and 2007.



## Policy 8: Community Access and Economic Development

**Support local efforts to increase jobs, expand housing, and improve community livability through more coordinated planning, complimentary design, and timely communication among land use and transportation authorities.**

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### 8.1 Airport Airspace and Land that is Protected

**Measure:** Percent of publicly funded Minnesota airports that have Airport Safety Zoning.

**Target:** All publicly funded airports are required to adopt Airport Safety Zoning as per Minnesota Statutes 360.305 Subd. 6.

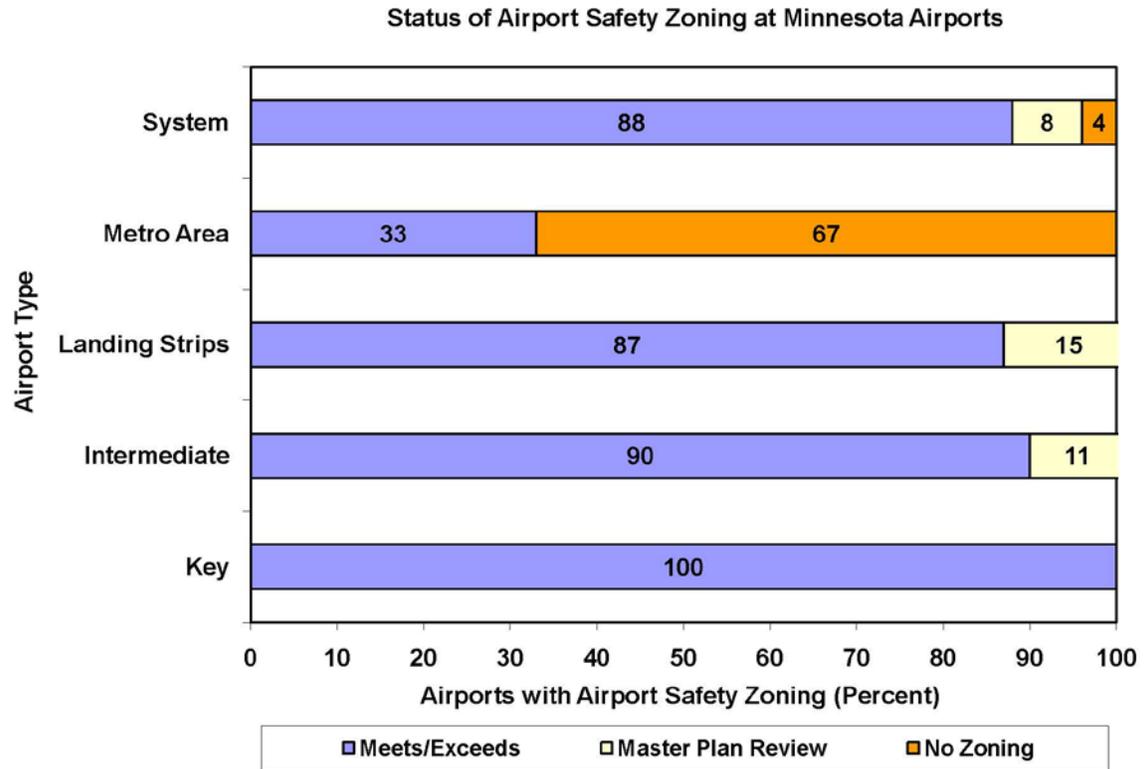
**Relevance/Purpose:** As airport use has increased, so have associated impacts and airport expansion needs. Compatibility of land uses around airports will reduce problems as the use of airport facilities increases, and expansion of these facilities is contemplated. The purpose of this measure is to encourage adjacent land uses that are consistent with long-range airport plans.

**Source:** 2006 State Aviation System Plan

**Reporting Office:** Mn/DOT Office of Aeronautics

**Methodology:** As illustrated in the figure below, the measure identifies the percent of land protected for airports as identified in airport master plans or airport layout plans. These plans specify safety, noise, and height requirements as well as any expansion needs.

**Trends:** This measure applies to all Minnesota airports, including those under the Metropolitan Airports Commission in the TCMA, airports in the Greater Minnesota system have zoning that meets, exceeds, or is in the process of meeting, through the master plan review process (MPR), the target set. The Minnesota airports that did not meet the Minnesota Airport Zoning target in 2006 were the general aviation airports in the TCMA that are owned by the Metropolitan Airports Commission.



## Policy 9: Energy and the Environment

**Increase the energy efficiency and environmental sustainability of Minnesota’s transportation system.**

### 9.1 Compliance with Criteria Air Pollutant Standards

**Measure:** Federal Compliance Standards. Outdoor levels of ozone, nitrogen dioxide, carbon monoxide and particulate matter.

**Target:** Monitored as a percent of the National Ambient Air Quality Standards (NAAQS)

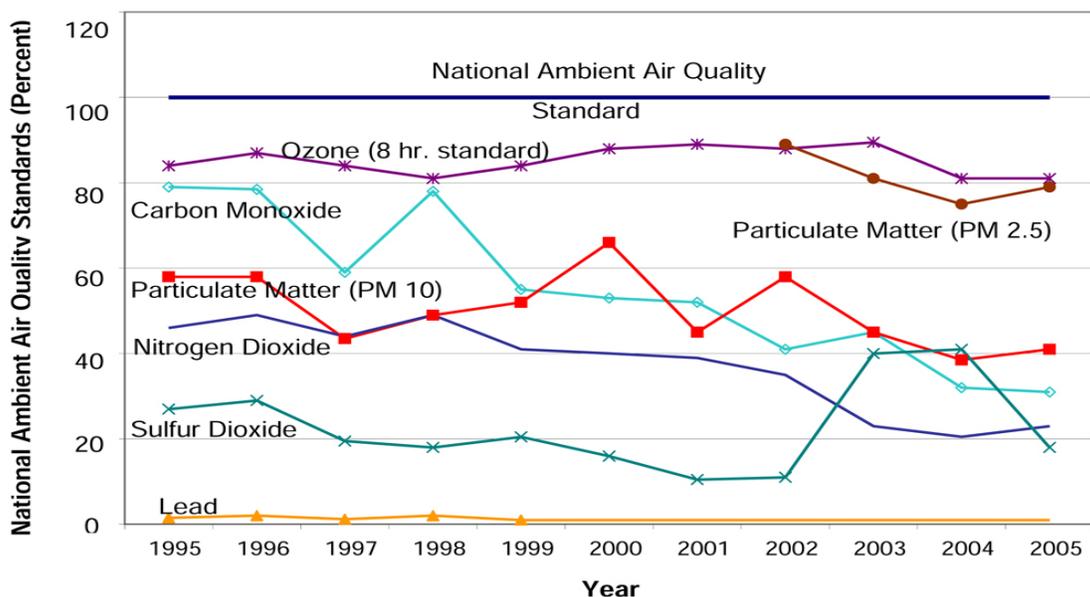
**Relevance/Purpose:** Over the last 40 years, Minnesota transportation authorities have done their part to advance environmental stewardship by instituting guidance with proven results. Minnesota has instituted the guidance set forth in the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU) of 2005 for greater public and agency involvement and consultation in project planning and environmental review in an effort to better inform the transportation project planning process and develop mitigation strategies. Minnesota has instituted the guidance set forth by the Environmental Protection Agency (EPA) and Federal Highway Administration (FHWA) regarding which, when, and how mobile source air toxics are to be analyzed in the National Environmental Policy Act (NEPA) process.

**Source:** Minnesota Pollution Control Agency

**Reporting Office:** Mn/DOT Office of Environmental Services

**Methodology:** The measure tracks the Twin Cities’ compliance with federal standards for outdoor levels of ozone, nitrogen dioxide, carbon monoxide, and particulate matter.

**Trends:** Twin Cities’ air quality presently meets federal standards. The expectation is that air quality will continue to meet or exceed the federal standards.



## 9.2 Mn/DOT Use of Cleaner Fuels

**Measure:** Gallons of fuel (with the percent ethanol subtracted) purchased for use in Mn/DOT on-road vehicles.

**Target:** Based on targets established by Executive Order 04-10, issued in September 27, 2004, and using 2005 as a baseline, the state shall do the following:

- Reduce the use of gasoline by on-road vehicles owned by state agencies by 25 percent by 2010 and by 50 percent by 2015.
- Reduce the use of petroleum-based diesel fuel used by state agencies by 10 percent by 2010 and by 25 percent by 2015.

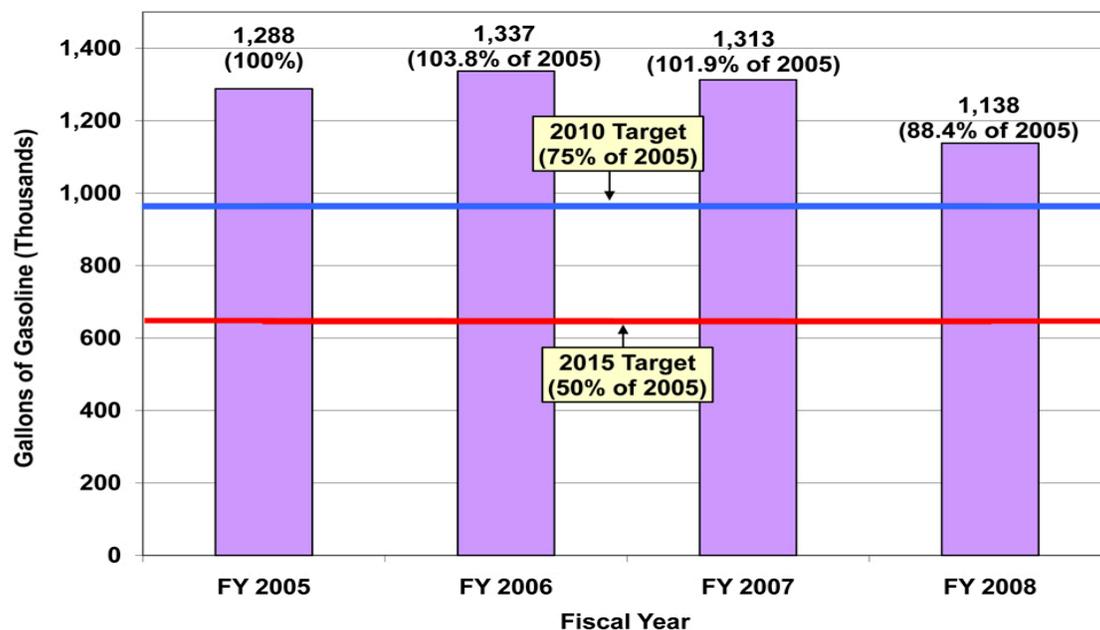
**Relevance/Purpose:** The state's vision is to create a shared service effort that would coordinate fleet management business, technology and operational functions across agencies. The state would realize better utilization of vehicles, facilities and agency expertise; improved service to agencies; and reduce costs. Cleaner fuels in state vehicles are an important part of this vision.

**Source:** Mn/DOT Office of Maintenance

**Reporting Office:** Mn/DOT Office of Maintenance

**Methodology:** Yearly retail and bulk fuel purchases are recorded and disseminated by Mn/DOT's Office of Maintenance. The office reports data on the number of E85 and gasoline gallons purchased by Mn/DOT in each Fiscal Year.

**Trends through 2008:** Mn/DOT's on-road vehicle fleet has reduced its use of gasoline in Fiscal Year 2008 by more than 10 percent when compared to Fiscal Year 2005 levels.



### 9.3 National Pollution Discharge Elimination System Compliance - Erosion Control

**Measure:** Size of civil and Supplemental Environmental Project (SEP) penalties associated with substantiated violations of Mn/DOT’s MS4 and construction National Pollution Discharge Elimination System (NPDES) permits.

**Target:** There is no target associated with this measure.

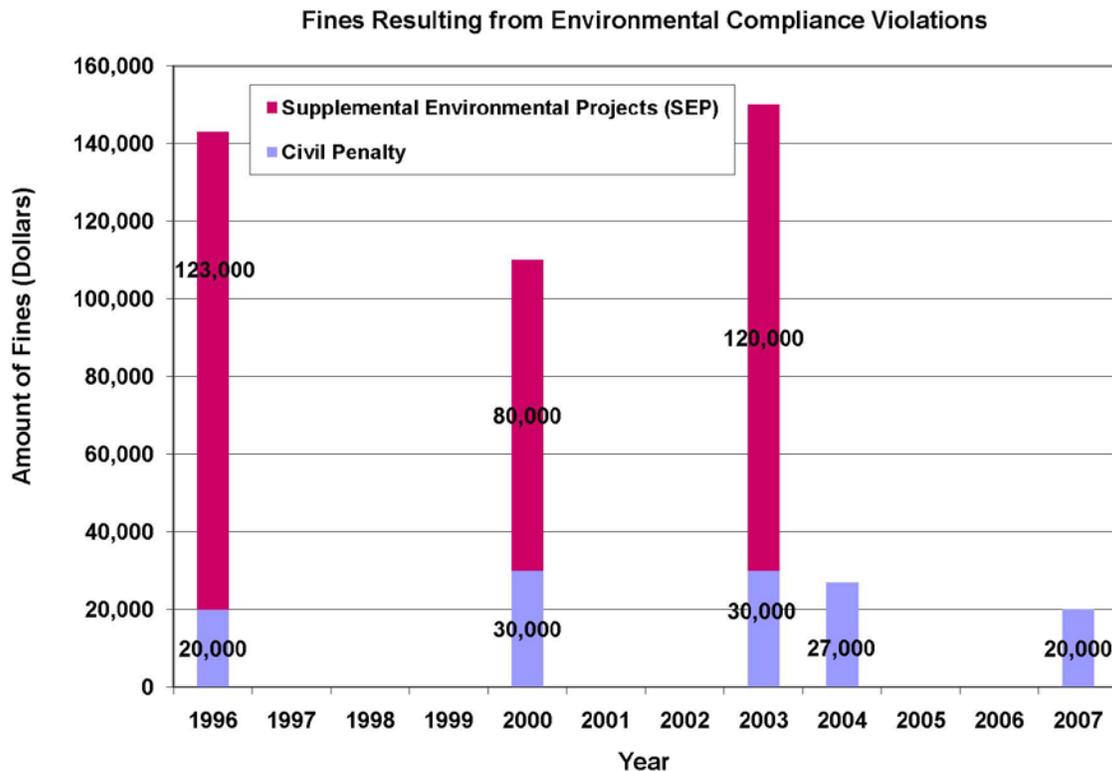
**Relevance/Purpose:** This measure tracks Mn/DOT’s compliance with environmental requirements related to pollution prevention regarding construction practices. Past practices and penalty incurring violations have lead Mn/DOT to develop an educational training program outlining proper NPDES and DNR permits.

**Source:** Mn/DOT Office of Environmental Services and Office of Technical Support

**Reporting Office:** Mn/DOT Office of Environmental Services

**Methodology:** Identifies the total Civil and SEP penalties incurred by construction projects for a given year. Note that this measure does not include design-build projects. For example, in 2007 the TH 212 design build project which incurred a \$30,000 civil penalty is not reflected in the 2007 total shown in the chart below.

**Trends through 2007:**



## 9.4 Wetlands Affected and Replaced

**Measure:** Ratio of acres replaced by Mn/DOT to acres of wetland affected.

**Target:** The legal requirement and minimum target is to replace affected wetland so that there is no net loss, thus a 1 to 1 ratio is the target.

**Relevance/Purpose:** The Minnesota State Conservation Act requires that wetlands are to be replaced by a ratio of no less than 2:1 in western, central and southern Minnesota (where less than 50 percent of the historical wetland base remains) and a ratio of no less than 1:1 in northeastern Minnesota (where more than 80 percent of the historical wetland base remains). State and federal regulatory programs also require these replacement ratios as part of their wetland permit conditions.

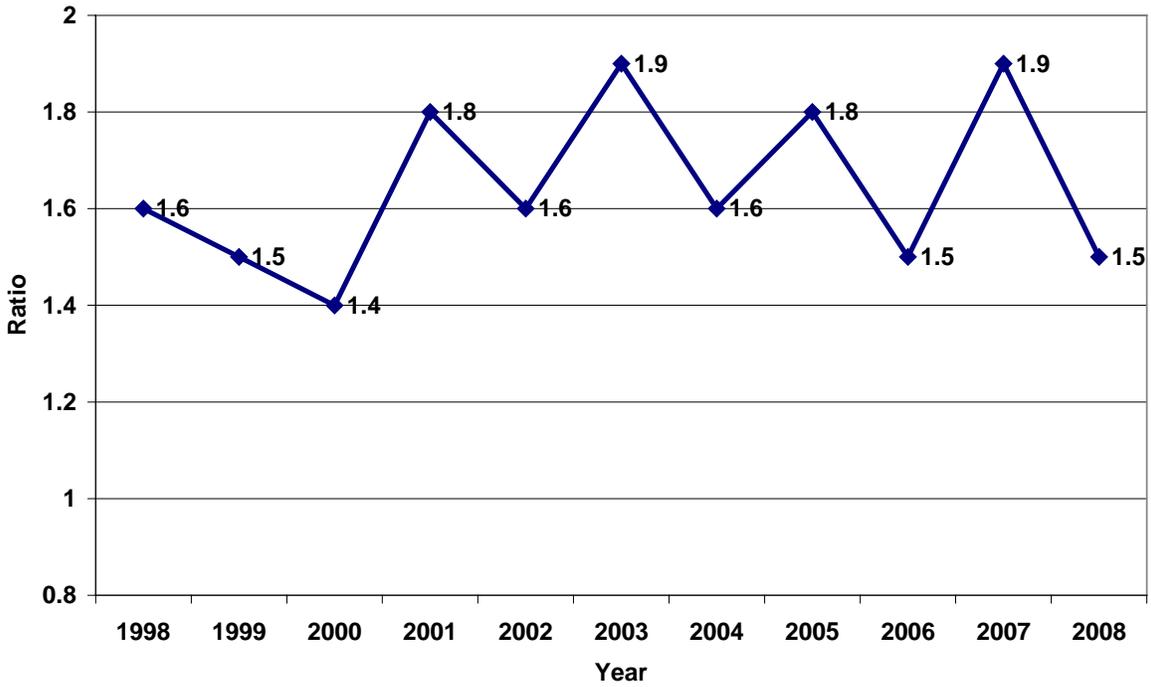
**Source:** Mn/DOT Office of Environmental Services

**Reporting Office:** Mn/DOT Office of Environmental Services

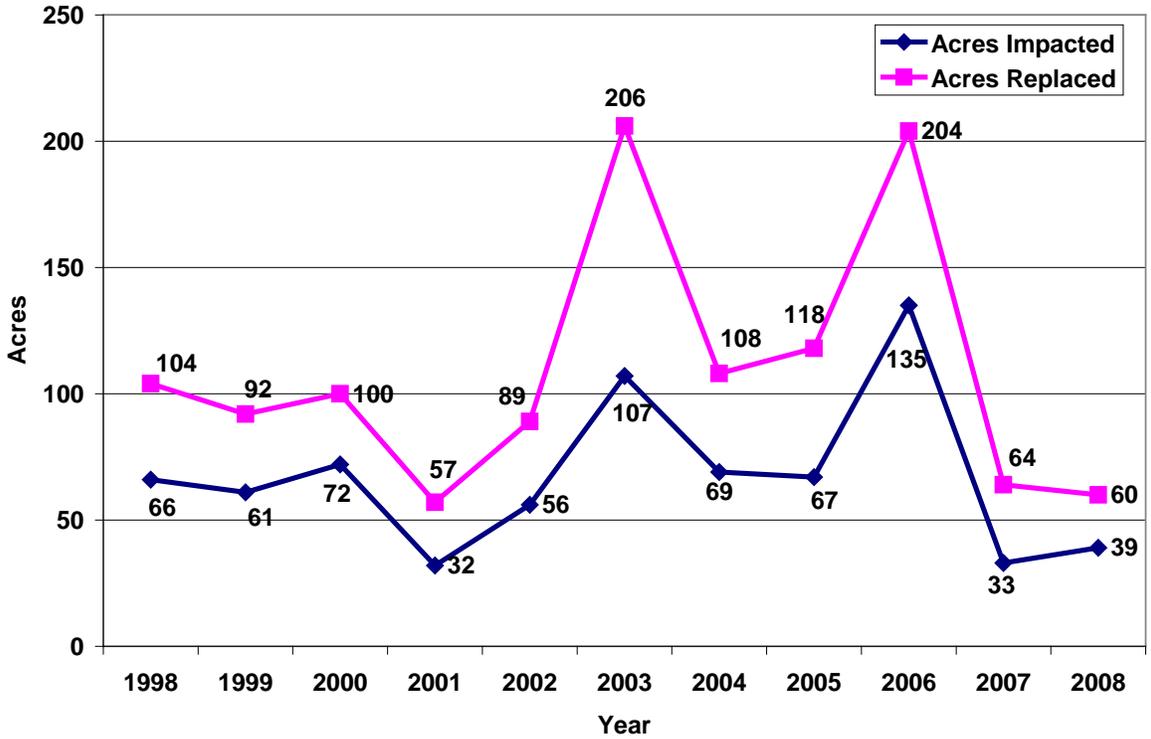
**Methodology:** Acres of wetlands impacted are primarily determined by quantifying the footprint of wetland fill resulting from highway construction. Wetland drainage and excavation also constitute wetland impacts and are quantified if appropriate. Wetland replacement can be achieved either by project-specific mitigation or by withdrawing credits from an established wetland bank. In 2005 Mn/DOT and the Board of Water and Soil Resources (BWSR) formed a Cooperative Wetland Replacement Program for road projects. The program is administered by BWSR and funded by both BWSR and Mn/DOT. Mn/DOT funds go towards the purchase of wetland credits for state road project needs.

**Trends through 2008:** Mn/DOT has consistently exceeded the requirement of meeting the target of replacing at a ratio of at least 1:1. Over the past five years -2004 through 2008- Mn/DOT has affected 343 acres and replaced 554 acres, a 1.6 to 1 ratio.

Ratio of Acres Replaced to Acres Impacted



Acres of Wetland Impacted and Replaced



## **Policy 9 Developmental Measures:**

**Mn/DOT is exploring the feasibility of the following energy and environment measure:**

### **Carbon Dioxide Emissions from the Transportation Sector**

There is a statewide target of reducing overall carbon dioxide emissions 15 percent by 2015, 30 percent by 2025, and 80 percent by 2050. It is expected that reductions in the transportation sector will contribute to meeting the overall goal. According to policy analysis seen to date, transportation represents around 33 percent of national carbon dioxide emissions and it is estimated that highway vehicles generate 72 percent of those emissions. In Minnesota 24 percent of total greenhouse gas emissions are produced by the transportation sector. In an effort to reduce state and national green house gas emissions from the transportation sector, Minnesota will follow the guidance set forth by the EPA and the state legislature by completing a mobile source emission inventory. Completion of this inventory will help track emissions and aid in the development of this measure.

## Policy 10: Accountability and Transparency

**Strengthen accountability and transparency in the delivery of Minnesota's transportation system.**

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### 10.1 Projects Let on Schedule, STIP Projects, Current Year

**Measure:** Percent of projects in the first year of the STIP let in the planned year.

**Target:** 90 percent of projects scheduled are let in the planned year.

**Relevance/Purpose:** Every year, Mn/DOT commits to a four-year published program of transportation projects, the Statewide Transportation Improvement Program (STIP). This program includes projects of all sizes and types throughout the state. To enhance accountability for delivering projects on schedule Mn/DOT has established this measure to track the letting of Mn/DOT highway projects listed in the STIP.

**Source:** Mn/DOT Office of Technical Support

**Reporting Office:** Mn/DOT Office of Technical Support

**Methodology:** This measure focuses on projects in the first year of the STIP and tracks the percent that are let for construction in that year.

**Trends:** See graph in measure 10.2 below.

## 10.2 Projects Let on Schedule, STIP Projects, Fourth Year

**Measure:** Percent of projects entering the STIP let on schedule (within four years).

**Target:** There is no target associated with this measure.

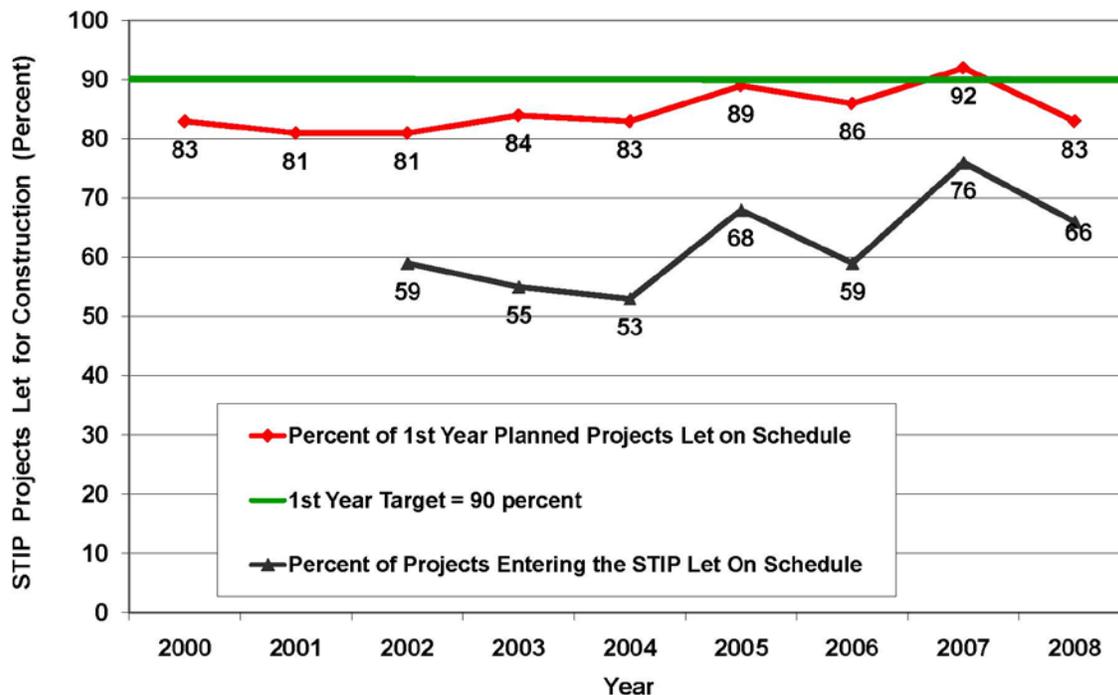
**Relevance/Purpose:** Every year, Mn/DOT commits to a four-year published program of transportation projects, the Statewide Transportation Improvement Program (STIP). This program includes projects of all sizes and types throughout the state. To enhance accountability for delivering projects on schedule Mn/DOT has established this measure to track the letting of projects listed in the STIP. This measure focuses on projects entering the STIP and tracks the percent that are let for construction in the planned year or earlier.

**Source:** Mn/DOT Office of Technical Support

**Reporting Office:** Mn/DOT Office of Investment Management

**Methodology:** This measure focuses on projects in the fourth year of the STIP let within four years and tracks the percent that were let for construction. Beginning in 2009, STIPs will encompass a four years period. Prior to 2009, they encompassed three years. The measure excludes projects that are split, combined or with scope change.

### Trends through 2008:



### 10.3 Construction Cost Overruns

**Measure:** Construction cost overruns are measured as a percent difference between the original contract amount and the final project cost.

**Target:** Limit construction cost overruns to not more than 7 percent of the original contract amount.

**Relevance/Purpose:** To measure how program delivery practices affect construction costs and to find ways to reduce the cost overrun of construction projects.

**Source:** Construction Management System (CMS) database application

**Reporting Office:** Office of Construction and Innovative Contracting

**Methodology:** Compare construction projects let during a consecutive three-year period (beginning January 1 of the first year, to November 1 the third year) with the previous rolling, consecutive three-year period (e.g. the period 2007-2009 versus the period 2006-2008). To be considered, projects must meet the following criteria:

- Must have an original contract value of \$1M or more<sup>5</sup>,
- Be at least 95 percent complete<sup>6</sup>, and,
- Not be a county contract (C), a contract administered on behalf of another entity, e.g. locally initiated projects (X, Z)<sup>7</sup>, or an emergency contract (E)<sup>8</sup>.

**Trends through 2008:** This is a new measure and a trend is not available. However, an April 10, 2009 snapshot showed the statewide average construction overrun cost for the three-year period 2006-2008 was \$28,930k, or (4.2 percent).

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<sup>5</sup> Construction projects let during the period 2006-2008 with an original contract amount of > \$1M accounted for 211 of the 538 construction projects (39.2%), but 93.8% of all construction project dollars.

<sup>6</sup> Use of a three-year, rolling average provides a clearer picture of construction practices involving both single-year and multi-year projects, and should provide more consistency and clarity in depicting trends.

<sup>7</sup> County and special contracts (C, X, Z) accounted for 41 of the 538 projects (7.6%).

<sup>8</sup> Emergency contracts are in response to an extraordinary event and therefore not representative of standard construction practices or costs. Though some of these projects may be of a considerable dollar value, they are omitted for clarity in discerning trends.

## 10.4 Customer Satisfaction with Reliability of Mn/DOT Communications

**Measure:** Percent of respondents to the Omnibus survey that rate the reliability of Mn/DOT Communications at 7 or higher.

**Target:** The target for this measure is 60 percent.

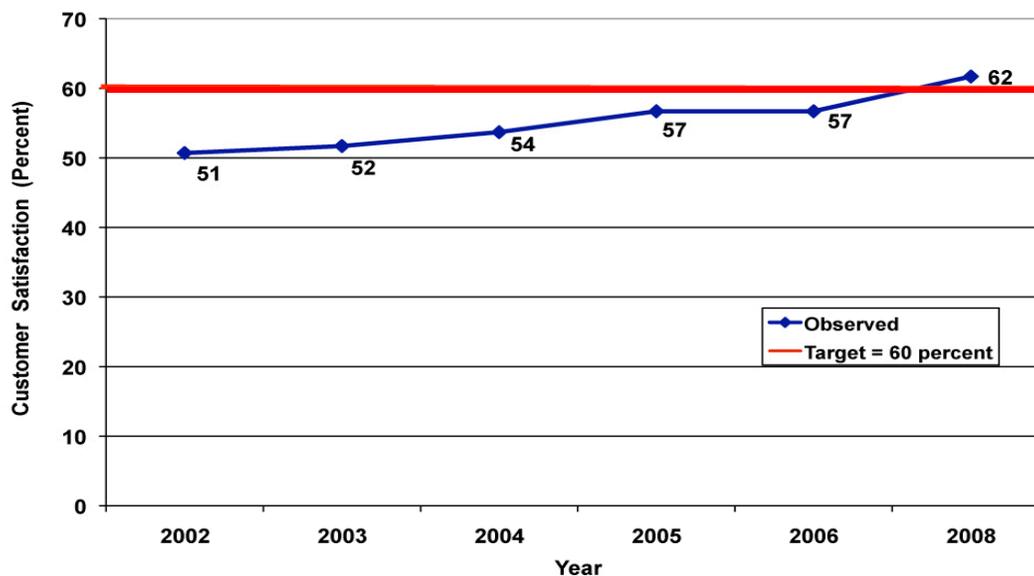
**Relevance/Purpose:** Transparency at Mn/DOT includes providing stakeholders with information, engaging them in the decision making process, and working collaboratively with them to identify and refine the objectives of the agency and to develop strategies to meet these objectives. One way to measure transparency is by monitoring Mn/DOT's customers' satisfaction with the reliability of their communications.

**Source:** Mn/DOT Market Research

**Reporting Office:** Mn/DOT Office of Policy Analysis Research and Innovation

**Methodology:** Customer perceptions are measured annually through the Omnibus survey. The Omnibus is a telephone survey of a representative statewide sample of 800 citizens. Each year customers are asked the question; "Thinking about all the different communications provided by the Department of Transportation, how reliable are these communications in your opinion?" Respondents use a 1-10 scale to rate the reliability of Mn/DOT communications, 1 being low and 10 being high. No data was collected in 2007.

**Trends through 2008:** The perceived reliability of all Mn/DOT communications increased significantly in 2008 as compared to 2006<sup>9</sup>. The percentage of people who rated the reliability a 7 - 10 on a 10-point scale increased to 62 percent, which is above the target set for 2006 (60 percent).



<sup>9</sup> This survey was not conducted in 2007

## **Policy 10 Developmental Measures**

### **Variation in Total Project Cost**

This developmental measure tracks the percent variation in project cost from the approved Total Project Cost Estimate (TPCE) when a project enters the 4<sup>th</sup> year of the STIP to the cost at letting. This measure is being developed to monitor progress in implementing Mn/DOT's new scoping and cost estimating processes. Mn/DOT has been using a project cost variation measure but it did not capture all projects or all project costs. A parallel measure will be developed to monitor the percent variation in the total construction program cost each year.

### **Mn/DOT is exploring the feasibility of the following accountability measure:**

#### **Number and Value of Contract Amendments (Supplemental Agreements) During Construction**