



State Highways and Bridges

Major Findings:

- After 2003, inflation-adjusted revenues from Minnesota motor vehicle and fuel taxes declined, and the state made substantial use of debt financing to support the state trunk highway system.
- Although the Minnesota Department of Transportation (MnDOT) has a “preservation first” policy, over half of trunk highway construction spending since 2002 has gone toward system expansion, leaving important preservation needs unmet.
- Since 2002, the ride quality of state trunk highways has generally declined. The structural condition of bridges has generally improved.
- MnDOT estimates that it will need \$672 million per year between 2012 and 2018 for trunk highway preservation, about equal to the forecasted revenues available for all trunk highway construction.
- MnDOT has consistently scheduled more state trunk highway projects than it could deliver given available funding.
- According to MnDOT districts, Minnesota does not have a shortage of certified bridge inspectors, but it needs additional resources to conduct specialized inspections of fracture critical bridges.

- MnDOT districts reported performing the high-priority work recommended by bridge inspectors, but said they are falling behind on routine maintenance.
- MnDOT does not adequately document how it follows up on bridge inspectors’ maintenance recommendations.

Recommendations:

- Early in 2008, MnDOT should present to the Legislature the implications of its current financial projections, and it should adopt financial management policies to guide the use of debt financing for state trunk highway investments.
- MnDOT should ensure that the projects included in its trunk highway program plans can realistically be delivered within the funds projected to be available.
- MnDOT should assess the sufficiency of districts’ bridge maintenance staffing and make additional resources available, as needed.
- MnDOT should provide the operating funds necessary to meet bridge inspection frequency requirements for fracture critical bridges.
- MnDOT should establish standard procedures for documenting, communicating, and following up on bridge inspectors’ maintenance recommendations.

In recent years, Minnesota has used debt financing for highway expansion projects but has not invested adequately to maintain many existing highways.

Report Summary

On August 1, 2007, the Interstate 35W bridge over the Mississippi River in Minneapolis collapsed. The tragedy raised many questions about the safety of Minnesota's highways and bridges and the state's investments in maintaining them.

Minnesota's trunk highway system consists of over 11,000 miles of roadway and 4,500 bridges and culverts. Funds for the construction, operation, and maintenance of trunk highways and bridges come from state motor vehicle and fuel taxes, federal revenues, bonds, and other sources.

When adjusted for inflation, trunk highway funding in fiscal year 1998 totaled \$1.4 billion. In the years since, inflation-adjusted funding reached a peak of \$1.8 billion in fiscal year 2003, then decreased to \$1.5 billion in fiscal year 2007, a 16 percent decline.

When adjusted for inflation, tax revenues directed to the State Trunk Highway Fund have decreased since 2003, and MnDOT staffing has declined as well.

Historically, Minnesota has relied heavily on state transportation taxes to fund the trunk highway system, but receipts from these taxes have not kept pace with inflation. Motor vehicle and fuel taxes accounted for about two-thirds of trunk highway resources in 1998. By 2007, these taxes accounted for about half. Since 2003, the state has made substantial use of debt financing techniques to support the state trunk highway system.

Between fiscal years 1998 and 2007, MnDOT staffing peaked at 5,649 in fiscal year 2001 and fell to a low of 4,555 in fiscal year 2007. MnDOT employed more professional and paraprofessional engineers in 2007 than 1998, but the number of front line workers for trunk

highway operations and maintenance has declined.

MnDOT is spending more—and a greater percentage of its resources—on trunk highway road and bridge construction than it did ten years ago.

MnDOT has increased the proportion of trunk highway spending dedicated to system construction, and decreased the proportion spent on operations, research, and support. In the 2002-03 biennium, about 63 percent of department spending was for road and bridge construction. Between 2003 and 2004, MnDOT reallocated over \$36 million from its operating budget to fund highway construction. By the fiscal year 2006-07 biennium, spending on trunk highway road and bridge construction had increased to 71 percent of total spending.

Overall, the condition of trunk highway pavements has deteriorated since 2002, while the structural condition of bridges has improved.

The road quality index that MnDOT uses to gauge pavement conditions shows that about 66 percent of expressways and other principal roads were in good condition in 2007, compared to 72 percent in 2002. A similar decline has been measured on nonprincipal roads, which fell from 65 percent in good condition in 2002 to 59 percent in 2007. Over the same time period, the percentage of roads in poor or very poor condition increased. MnDOT predicts that, under its current spending plan, the number of trunk highway miles in poor condition will double by 2011.

In contrast, the overall structural condition of state trunk highway bridges improved. Between 2002 and 2006, the condition of bridges over 20 feet long on expressways and other principal roads improved, from 51 percent in good condition (weighted by deck area) to 55 percent, and from 5 percent in poor condition to 3 percent. The condition of

Although MnDOT is spending more on construction than in the past, state trunk highway pavement conditions have deteriorated.

trunk highway bridges on nonprincipal roads also improved. In addition, between 2002 and 2006, MnDOT reduced the number of state trunk highway bridges deemed “structurally deficient.”

Acting on 1997 recommendations from the Legislative Auditor, MnDOT established performance-based criteria for choosing state trunk highway projects.

In 2003, MnDOT issued a 20-year statewide transportation plan that laid out three strategic priorities: preserving existing infrastructure, improving traffic safety and mobility, and operating the department efficiently. The plan states that preservation and safety are MnDOT’s top priorities, with resources going to system enhancements only after preservation of the existing system has been considered. MnDOT also established performance targets for the condition of trunk highway roads and bridges.

Overall, trunk highway project investments have not aligned with the department’s stated policy of “preservation first.”

Between fiscal years 2002 and 2007, over half of MnDOT’s spending on construction contracts for trunk highway pavements was allocated to system expansion rather than preservation. In contrast, in fiscal year 2001, only 25 percent of pavement contract spending was allocated to expansion projects.

Between fiscal years 2001 and 2007, roughly 50 to 60 percent of bridge investments were for bridge replacement. Investments intended to preserve existing bridges—such as painting, deck repair, and joint repair—remained fairly steady at about \$13 to \$14 million per year between fiscal years 2001 and 2006, increasing to \$26 million in 2007.

By 2004, state trunk highway pavement conditions were worsening, but

commitments for major expansion projects, decreasing resources, and rising costs for construction materials limited MnDOT’s ability to redirect resources to preservation.

To meet expected needs in the coming years, MnDOT will need to direct virtually all available funds to preservation projects.

According to MnDOT executives, to meet preservation needs from 2012 to 2018, the department will need to devote virtually all of the state trunk highway construction budget to preservation. MnDOT estimates that the state should invest about \$672 million per year for fiscal years 2012 to 2018 in order to meet ride quality and bridge condition performance targets. This is about \$350 million more per year in preservation spending than is currently planned.

MnDOT has not enacted policies to guide the use of debt financing for state trunk highway projects.

Historically, Minnesota financed trunk highway construction projects on a pay-as-you-go basis. But in 2003, the state financed \$800 million of trunk highway expansion projects through a combination of bond sales and use of federal advance construction authority (also a form of debt financing). Given the risks associated with these financing techniques, we think it prudent for MnDOT to work with the Legislature to (1) establish the parameters under which the state should use debt financing techniques and (2) adopt formal policies guiding their use.

MnDOT’s district offices say they have enough certified bridge inspectors, but MnDOT needs additional resources to inspect fracture critical bridges.

In Minnesota, “Bridge Inspector” is generally not a full-time position. Rather, most inspectors are maintenance

If it adheres to its “preservation first” policy, MnDOT will need to spend virtually all of its construction funds on preservation in the coming years.

MnDOT needs to better document the maintenance recommendations and activities that result from bridge inspections.

staff employed by MnDOT district offices, counties, and cities. Minnesota had 329 certified team leaders (73 in MnDOT districts) and another 354 certified assistant inspectors as of October 2007. In the Twin Cities Metro District and two others we visited, officials responsible for the bridge inspection program told us that their districts have sufficient resources—people, time, and equipment—to conduct thorough, timely routine inspections because MnDOT makes inspection a priority. However, MnDOT will need additional resources to fully implement a 2005 change in federal standards, which requires specialized inspections of fracture critical bridges every two years.

MnDOT districts told us they are completing high-priority bridge repairs, but said they are falling behind on routine maintenance.

District officials said they promptly address safety-related and other high-priority bridge maintenance needs. However, they also reported having too few bridge maintenance crews and staff

for the amount of maintenance that should be performed. For example, in 2001, the Metro District operated 6 bridge maintenance crews with 32 bridge workers, and it hired 2 to 3 seasonal workers per crew. In 2007, the district operated 5 crews with 25 bridge workers and did not hire any seasonal staff to assist them. District officials said the staff reductions are the result of budget restrictions.

MnDOT does not adequately document its follow-up on inspectors' maintenance recommendations.

MnDOT does not have formal, standard procedures for conveying inspectors' findings to maintenance crews or documenting decisions on the maintenance work to be performed. District officials told us there is direct, frequent communication between inspectors and maintenance supervisors about needed bridge repairs. However, we think a more formal, standard process is needed to ensure that inspection findings are addressed. The Metro District was piloting such a process in January 2008.

Summary of Agency Response

In a letter dated February 14, 2008, Lieutenant Governor and Transportation Commissioner Carol Molnau wrote, "The report provides accurate information and helpful recommendations" and "will contribute to an enhanced discussion among all parties on how to cost-effectively preserve our critical transportation infrastructure." The Commissioner noted that the department has taken or will be taking actions consistent with the report's findings and recommendations, including committing additional funding to bridge replacement, continuing to address pavement conditions, implementing a statewide system for tracking maintenance decisions made in response to bridge inspections, and formally adopting new financial management policies. She added that the Federal Highway Administration has consistently found Minnesota's bridge inspection program to be in compliance with federal standards.

The full evaluation report, *State Highways and Bridges*, is available at 651-296-4708 or:
www.auditor.leg.state.mn.us/ped/2008/trunkhwy.htm