



Report on

Major Highway Projects and Trunk Highway Fund Expenditures

December 2014



Prepared by

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Legislative Request

Legislative requirements

This report was completed to comply with Minn. Stat. 174.56 and Laws of Minnesota 2012, Chapter 287, Article 4, Section 48.

Minnesota Statute 174.56:

174.56 REPORT ON MAJOR HIGHWAY PROJECTS AND TRUNK HIGHWAY FUND EXPENDITURES.

Subdivision 1. Report required.

- (a) The commissioner of transportation shall submit a report by December 15 of each year on
 - (1) the status of major highway projects completed during the previous two years or under construction or planned during the year of the report and for the ensuing 15 years, and
 - (2) trunk highway fund expenditures.
- (b) For purposes of this section, a "major highway project" is a highway project that has a total cost for all segments that the commissioner estimates at the time of the report to be at least
 - (1) \$15,000,000 in the metropolitan highway construction district, or
 - (2) \$5,000,000 in any nonmetropolitan highway construction district.

Subd. 2. Report contents; major highway projects.

For each major highway project the report must include:

- (1) a description of the project sufficient to specify its scope and location;
- (2) a history of the project, including, but not limited to, previous official actions by the department or the appropriate area transportation partnership, or both, the date on which the project was first included in the state transportation improvement plan, the cost of the project at that time, the planning estimate for the project, the engineer's estimate, the award price, the final cost as of six months after substantial completion, including any supplemental agreements and cost overruns or cost savings, the dates of environmental approval, the dates of municipal approval, the date of final geometric layout, and the date of establishment of any construction limits;
- (3) the project's priority listing or rank within its construction district, if any, as well as the reasons for that listing or rank, the criteria used in prioritization or rank, any changes in that prioritization or rank since the project was first included in a department work plan, and the reasons for those changes;
- (4) past and potential future reasons for delay in letting or completing the project, details of all project cost changes that exceed \$500,000, and specific modifications to the overall program that are made as a result of delays and project cost changes;
- (5) two representative trunk highway construction projects, one each from the department's metropolitan district and from greater Minnesota, and for each project report the cost of environmental mitigation and compliance; and

(6) the annual budget for products and services for each Department of Transportation district and office, with comparison to actual spending and including measures of productivity for the previous fiscal year.

Subd. 2a. Report contents; trunk highway fund expenditures.

The commissioner shall include in the report information on the total expenditures from the trunk highway fund during the previous fiscal year, for each Department of Transportation district, in the following categories: road construction; planning; design and engineering; labor; compliance with environmental regulations; administration; acquisition of right-of-way, including costs for attorney fees and other compensation for property owners; litigation costs, including payment of claims, settlements, and judgments; maintenance; and road operations.

Subd. 3. Department resources.

The commissioner shall prepare and submit the report with existing department staff and resources.

Laws of Minnesota 2012, Chapter 287, Article 4, Section 48

Sec. 48. ADDITIONS TO REPORTS ON MAJOR HIGHWAY PROJECTS AND TRUNK HIGHWAY FUND EXPENDITURES.

For 2013 and 2014 reports required under Minnesota Statutes, section 174.56, the commissioner of transportation shall include the results of evaluations of management systems currently used by the Department of Transportation. The evaluations must specify the extent to which the management of data in these systems is consistent with existing policies and the need for statewide, reliable, and verifiable information. The evaluations must be performed either by the department's office of internal audit or by an independent external auditor. The 2013 report must include the evaluation of construction management systems and the program and project management system. The 2014 report must include the evaluation of pavement management systems and bridge management systems.

Report cost

Total report cost is approximately \$143,000.

The cost of preparing the report elements required by Minn. Stat. 174.56 is approximately \$80,000.

The cost of evaluating the pavement management systems and bridge management systems, as required by Laws of Minn. 2012, Ch. 287, Art. 4, Sec. 48, is approximately \$63,000.

The 2013 Major Highway Projects and Trunk Highway Expenditure Report was significantly higher due to the need to develop the process and data needed to report on the budget by products and services and productivity measures.

Purpose and Scope of this Report

Introduction

The first legislative report on Major Highway Projects and Trunk Highway Fund Expenditures report was due in January 2009. In 2012, the legislature made significant changes to the reporting requirements. These changes include:

- A reduction in the cost threshold for what constitutes a “major” project for the purposes of this report
- Additional information on project costs and changes in costs
- Information about the annual budget for products and services, with a comparison to actual spending and including measures of productivity for the previous fiscal year
- Reporting on trunk highway fund expenditures and on environmental costs for representative projects, both of which had previously been in a separate report
- An evaluation of certain management systems used by the department (required for 2013 and 2014 reports)

The Minnesota Department of Transportation’s business is to plan, build, operate and maintain Minnesota's transportation system. As in previous years, the 2014 edition of the Major Highway Projects and Trunk Highway Fund Expenditures report provides a snapshot of MnDOT’s programming and delivery for larger projects. This is consistent with the agency’s focus on delivering high quality projects on time and within budget.

This report includes information on MnDOT's overall financial management and the new system of budgeting by products and services that MnDOT is working to implement. No other state agency budgets this way, so existing state systems lack the ability to support this new process, which requires the development of new systems and infrastructure.

Finally, the report includes objective evaluations of MnDOT’s pavement management system and bridge management system.

Together, these changes will satisfy the requirements laid out in the law and help MnDOT continue to enhance its financial effectiveness.

The report is organized into the following sections:

- Major highway projects report
- Environmental mitigation costs
- Trunk highway fund expenditures
- Management systems evaluations
- Products and services budget expenditures report

- Productivity measures
- Major highway project summary sheets

Summary of contents

Major highway projects

This section of the annual report identifies major projects on the state trunk highway system, which includes the interstate and national highway systems. Per Minn. Stat. 174.56, this report includes projects with cost estimates equal to or in excess of \$15 million in the Twin Cities Metro District and with cost estimates equal to or in excess of \$5 million in Greater Minnesota.

This report includes information on projects that meet the total project cost estimate criteria and are either under construction, programmed or planned within the next 15 years. For each project completed in the past two fiscal years (2012-2013) or identified for construction in the next four years (2014-2017), a project summary is included that provides detailed information on project location, purpose, scope, schedule, and cost. Each project planned for construction in 2018-2029 is included in a summary table near the end of the report with basic information on project location, description, schedule, and cost.

Projects are arranged by MnDOT district. A map and a list of projects precede the project summary pages within each district. The information provided in this report is current as of November 2014.

Environmental mitigation costs

Per the legislative requirement, the cost of environmental mitigation and compliance was analyzed for two representative projects.

1. The I-494 project in Hennepin County, located in MnDOT's Metro District, was chosen in part because it represents the types of mitigation that are central to all MnDOT projects.
2. The Highway 14 project in District 7 was chosen because it included extensive wetland mitigation and stormwater ponds.

Trunk highway fund expenditures

Fiscal Year (FY) 2014 expenditure information is provided for each of the categories specified in the statute.

Management systems evaluations

This year's report includes the evaluation of MnDOT's pavement management systems and bridge management systems. These evaluations were conducted by MnDOT's internal audit office.

The evaluations concluded that MnDOT's management of these systems is consistent with existing policies, the need for statewide, reliable and verifiable information, and the need for properly designed and implemented internal controls.

Product and service line budget

MnDOT is currently developing a new product and service grid that more accurately organizes and describes its products and services. The new grid is expected to be fully operational by fiscal year 2016.

The expenses and budgets provided in this report, by products and services, represent the department's annual budget for fiscal year 2014, as appropriated. It also includes expenses for services that may have been rendered in fiscal year 2013, but due to processing time would have been paid in fiscal year 2014.

Key challenges to implementation include:

- Timing differences between the two years of a biennium cause variances that would not be present if the report were prepared on a biennial basis. For example, carryover from the first year of the biennium to the second year can vary the results of the report depending on which year of the biennium is represented in the report.
- The inability to match some expenses to their original budgets due to system limitations in identifying the fiscal year budget to which the expenditures should be aligned. This occurs when an expenditure is made in one budget year and paid in the next.
- Carry over budgets may cause expenditures to exceed the total budget. These expenditures occur within a biennium and are allowed by statute.

Productivity measures

The productivity measures project is an effort to identify, create, examine, and document current levels of productivity within MnDOT. This project complies with the 2012 legislation requiring the commissioner to annually report measures of MnDOT productivity for the previous fiscal year.

Performance measures are not new at MnDOT. Traditional performance measures used by MnDOT are measures of product and service delivery effectiveness. However, productivity measures are still relatively new to the department with December 2014 marking only the second year MnDOT has produced the productivity report. Productivity measures align well with the department goal of enhancing financial effectiveness and are the next step to evaluate how efficiently MnDOT's products and services are delivered.

The report includes the following measures reported last year, although the pavement measure has been modified for this year's report:

- Bridges:
 - Inspection cost per square foot of deck area
 - Maintenance cost per square foot of deck area
- Pavement: Cost per additional roadway mile-year added
- Snow and ice: Cost per plow mile driven
- Pavement markings: Cost per mile striped
- Transit: MnDOT administrative cost per transit passenger trip

These areas represent a subset of MnDOT's products and services. New areas will continue to be added in subsequent reports as they are identified.

The background for each productivity measure is presented along with data through the previous 10 years where possible. Each measure includes a discussion about why the measure presented is a good measure of productivity and major influencing factors.

Three of the six productivity measures show the inflation-adjusted unit costs declining. Specifically, pavement cost per roadway mile-year added, pavement markings cost per mile striped and administrative cost per transit trip all show declining inflation-adjusted unit costs. Snow plow cost per mile driven was stable eight of the last 10 years. Both bridge inspection and bridge maintenance costs per unit show a slight upward trend. Expenditures for bridge inspection increased sharply in 2008 when the governor mandated accelerated inspections for all bridges. Additional funding for preventive bridge maintenance may partially account for the increase in bridge maintenance costs, in addition to aging bridges which require more expensive and more reactive maintenance.

Major Highway Projects Summary

This annual report identifies major projects constructed within the past two years, as well as all major projects programmed or planned for construction on the state trunk highway system over the next 15 years, including the interstate and national highway systems. Per Minn. Stat. 174.56, this report includes projects with cost estimates equal to or in excess of \$15 million in the Metro District and projects with cost estimates equal to or in excess of \$5 million in Greater Minnesota. This report includes 377 projects that met the statutory cost threshold. The information provided in this report is current as of April 2014.

Projects included in 2014 Major Highway Projects report

District	Projects completed, under construction or listed in the STIP	Projects in years 2019-2030	Total projects
1	34	30	64
2	21	5	26
3	33	21	54
4	30	12	52
6	38	30	68
7	41	24	55
8	11	7	18
Metro	31	10	41
State	248	129	377

Of the 377 projects reported this year, 41 are in the Twin Cities metro area and 336 are in Greater Minnesota. Projects vary in type, and include pavement preservation, bridge replacement and rehabilitation, and mobility projects based on the priorities established in the MnDOT’s 20-year State Highway Investment Plan, also known as MnSHIP.

State highway investment planning process

MnSHIP is an important link between the guiding principles in the [Minnesota GO 50-Year Vision](#), the strategies in the [Statewide Multimodal Transportation Plan](#) and the capital improvements made to the state highway system. MnSHIP sets a fiscally constrained framework for future capital improvements by identifying investment needs and priorities for available funding. This plan will serve as the framework for statewide investment on trunk highways for the next two years before a new 20-year investment plan is produced.

Figure 1: Planning mechanisms and plans



MnSHIP covers three planning periods: years 1-4, years 5-10 and years 11-20. Projects identified for years 1-4 (FY 2015-18) are those listed in the 2014 Statewide Transportation Improvement Program. MnDOT intends to deliver these projects during the next four years, although the programmed year of construction may be adjusted if actual revenues increase or decrease.

Investments identified for years 5-10 (FY 2019-24) include general funding levels for certain improvement categories (e.g., pavement preservation, traveler safety), as well as construction cost estimates for several specific projects within the improvement categories. These projects and their cost estimates should be considered preliminary, as revenue forecasts are uncertain.

Specific projects are not identified for years 11-20 (FY 2024-33); instead, MnSHIP has set broad investment priorities associated with funding allocations, which focus primarily on preserving the transportation assets MnDOT currently owns. Such elements include, but are not limited to:

- Pavement within MnDOT right of way
- Bridges
- Bike and pedestrian facilities
- Drainage structures
- Barriers, guardrails and fences
- Lighting and intelligent transportation system features
- Signs
- Noise walls

Investment priorities may change as a result of system performance conditions, legislative initiatives or federal requirements related to the recently adopted MAP-21 transportation bill.

MnDOT began the process by:

- Reviewing current investment priorities, asset conditions and other system needs
- Projecting the amount of federal and state funds that will be available for investment on the state highway system during the next 20 years
- Reviewing agency policy, as well as federal and state transportation laws
- Identifying emerging significant risks that may affect investment priorities

Next, MnDOT established a range of potential investment levels for nine categories of highway investment priorities. These investment levels were combined into example investment scenarios to solicit feedback from the public. For investment direction for the 20-year plan, MnDOT considered stakeholder input, legislative direction, federal requirements and system-wide risks and outcomes to develop a final mix of investment priorities. This investment direction guided statewide and district investment goals; these goals are achieved by districts developing a schedule of projects that comprise their investment programs and designed to make progress towards these goals.

Project selection

MnDOT selects projects through several different planning and programming processes, all designed to address performance-based needs and achieve key objectives on the trunk highway system. These processes are the methods used by MnDOT to decide how to use authorized federal and state funds and revenue from the sale of trunk highway bonds. The primary framework for project selection is outlined below.

10-year work plan¹

The existing investment plan known as MnSHIP created two programs to guide project selection at a state and regional level for the next 10 years. They are the Statewide Performance Program and the regional District Risk Management Program. The purpose of establishing these two programs is to ensure the department efficiently and effectively works toward common statewide goals. These goals consist of meeting Governmental Accounting Standards Board thresholds for pavements and bridges, and meeting MAP-21 performance targets, while simultaneously maintaining regional flexibility to address unique risks and circumstances at the district level.

Statewide Performance Program

The current federal transportation bill, MAP-21, places greater emphasis on National Highway System performance and requires MnDOT to make progress toward national performance goal areas, including those related to asset condition, safety and congestion. If MnDOT failed to adequately progress towards the national goals, it could result in the loss of some federal funding flexibility. Further, an analysis highlighted the expectation that MnDOT maintain the state's most important routes in a good repair. In response, MnDOT developed the Statewide Performance Program to ensure that federal and state performance targets are met on the NHS and that the condition of these routes meets public and MnDOT expectations.

¹ Years 1-2: Projects identified for FY 2015 and 2016 were based on investment priorities established in the [2009 State Highway Investment Plan](#) and in the existing [State Transportation Improvement Program](#), covering 2015-2018. In general, MnDOT considers projects listed in the STIP as commitments. As a result, the existing investment plan known as MnSHIP did not shape project selection for years 1-2.

District Risk Management Program

The SPP focuses funding on addressing key performance targets on NHS routes, while the DRMP focuses funding on all other non-NHS highways needs on all state highways. The majority of the program supports pavement and bridge rehabilitation or replacement projects. The DRMP project selection process is structured to give districts the flexibility to address their greatest regional and local risks. Districts are also able to make additional investments on the NHS system if the proposed project is in response to a high risk issue.

In the DRMP, each MnDOT district is responsible for selecting projects that mitigate its highest risks in the areas of asset management, traveler safety, critical connections, and projects which are a regional and community improvement priority. MnDOT distributes different levels of funding to the districts for this program based on a revenue distribution method that accounts for various system factors. MnDOT districts collaborate with Area Transportation Partnerships metropolitan planning organizations and other key partners to select projects.

MnSHIP directs 45 percent of MnDOT's annual revenues toward DRMP projects or approximately \$333 million per year, not including the cost of delivering those projects. The DRMP's share of MnDOT's annual program may vary in the future depending on the outcomes of MnDOT's ongoing risk-based and performance-based planning efforts. The investment category mixes for each district vary depending on the system characteristics and conditions unique to that area of the state.

Impacts of cost changes to the overall program

Changes to project costs and schedules affect the state trunk highway capital investment program. These effects are most directly seen through annual revisions to the STIP, which lists projects that MnDOT is planning to complete in the next four construction seasons. Seventy-five percent of the projects listed in the STIP are let and completed in their originally scheduled construction season. The completion date for other projects may be adjusted, and project scope and costs may increase or decrease after being listed in the STIP.

Project costs may change for a variety of reasons including: changes in economic conditions, inflationary factors, scope changes, supplemental agreements, cost overruns, right of way acquisition, etc. These costs may change prior to letting or after a contract is awarded. Changes in project costs prior to letting are handled through the STIP process. The STIP process allows projects to be added, revised or removed on an annual basis. Cost changes to a project post-letting are managed at the district level. If cost changes are higher than anticipated, set-asides are primarily used to handle the change. If project costs are lower than projected, other projects may be advanced to an earlier construction date. Project cost overruns, as well as cost savings, are managed on an aggregate program level.

If a statewide program (e.g., the statewide performance program) has cumulative cost estimate changes resulting in a significant amount of uncommitted funds, a specific, one-time program may be implemented, such as the recent Better Roads for a Better Minnesota, which focused on achieving statewide performance objectives for overall pavement condition. To deliver the Better Roads program, projects that most effectively achieved these performance objectives and were at an appropriate stage in the project development process were accelerated so they could be completed earlier than previously programmed.

Conversely, if cumulative project cost estimate changes increase by a significant enough level to necessitate revisions to the STIP, a number of projects may be delayed or removed, based on the fiscal ability to fully deliver each annual construction program. Projects that have not yet progressed through the project development process are more subject to these schedule delays or cost revisions.

Project prioritization

All projects identified within the 2015-18 STIP can be funded with current revenue projections and are high priority projects to the districts. Projects within the 2019-28 mid-range and long-range planning periods are a priority, but revenue forecasts, federal program requirements and funding sources are more uncertain and full funding may not have been identified. The [20-year Minnesota Highway Investment Plan](#) details how investments at a program level are prioritized in this mid-range and long-range timeframe.

Project summary sheets

See Appendix C for one-page summaries, statewide maps, district maps, and an indexed table of all major highway projects. An explanation of the information included for each project, common abbreviations and definitions are also included in the appendix.

Environmental Mitigation and Compliance Analysis

The two projects included represent the types of environmental mitigation and compliance issues MnDOT generally faces in the Metro area and Greater Minnesota. Both projects were completed during the 2013 -14 fiscal years.

The I-494 project in Hennepin County is located in MnDOT's Metro District. This project was chosen in part because it represents the types of mitigation that are central to all MnDOT projects, the acquisition of right of way.

MnDOT strives to only acquire the appropriate amount of right of way essential to a project; however, in the case of the I-494 project, the work was done without purchasing any additional right of way. In general, erosion and sediment control during the construction phase and permanent stormwater mitigation are important parts of MnDOT projects. Noise analysis was also part of this project; however, noise walls were not put in because the results of the noise analysis concluded a noise wall was not necessary.

The Highway 14 project in District 7 was chosen for analysis because it included extensive wetland mitigation and the construction of stormwater ponds. Wetland and stormwater runoff mitigation are representative of the types of environmental mitigation that occurs across Minnesota.

Metro District project: Interstate 494 (Bloomington)

This was a mill and overlay project, which also added an auxiliary lane and ramp metering on westbound I-494 from Nicollet Avenue to Portland Avenue in the city of Bloomington. The project was approximately 5.3 miles long.

The auxiliary lane was about 1,450 feet long, and had a retaining wall between the auxiliary lane and the I-494 frontage road. In addition, the project also included the following elements: a median guardrail replacement, curb and gutter work, catch basin replacement or reinforcement, signals and lighting, a loop detector and ramp meter work, replacement of pedestrian curb ramps, and other needed ADA modifications. No additional right of way was acquired for this project.

Environmental mitigation costs of \$353,900 are detailed in Figure 2 and account for roughly 1.1 percent of project costs.

The total project cost was \$31.7 million. The construction cost of the project was \$26.4 million, right of way land-related costs were \$0 and project engineering costs were \$5.3 million.

Figure 2: I-494 (Bloomington)

Environmental documents (Costs not included in mitigation cost total)	
Environmental assessment	\$17,200
Environmental investigation costs	
Historical/cultural resources	\$100
Contamination	\$370
Regulated waste	\$5,740
Sub-total	\$6,210
Preconstruction engineering costs	
Ponds	\$ 3,720
Sub-total	\$3,720
Construction engineering/administration costs	
Ponds	\$5,580
Erosion control	\$31,400
Sub-total	\$36,980
Right of way costs (land-related only)	
Wetlands (credits)	\$670
Sub-total	\$670
Construction costs	
Ponds	\$46,480
Erosion control	\$254,840
Regulated waste	\$5,000
Sub-total	\$306,320
Total environmental mitigation costs	\$353,900
Project delivery costs (Engineering)	
Preconstruction engineering	\$2,115,770
Construction engineering/administration	\$3,173,650
Total Engineering costs:	\$5,289,420

Total project cost	
Right of way	\$ 0
Construction	\$26,447,090
Engineering	\$5,289,420
Total project costs:	\$31,736,510
Percentage of project costs incurred for environmental mitigation and compliance (\$353,900 divided by \$31,736,510):	1.1%

Greater Minnesota project: Trunk Highway 14 (Nicollet County)

This project was located in District 7 in Nicollet County on Trunk Highway 14 from 5,300 feet west of CSAH 41 to 800 feet west of Lookout Drive in North Mankato. This project consisted of the following elements: road re-grading, concrete and bituminous re-surfacing, adding lighting, ADA improvements, constructing roundabouts and a bridge replacement (Bridge No. 52003).

Environmental mitigation costs of \$1,055,760 are detailed Figure 3 and account for roughly 4.7 percent of project costs.

The total project cost was \$22.4 million. The construction cost of the project was \$16.7 million, right of way land-related costs were \$709,430 and project engineering costs were \$3.3 million.

Figure 3: Trunk Highway 14 (Nicollet County)

Environmental documents (Costs not included in mitigation cost total)	
Environmental assessment	\$ 177,140
Environmental investigation costs	
Historical/cultural resources	\$ 1,450
Sub-total	\$1,425
Preconstruction engineering costs	
Ponds	\$3,500
Sub-total	\$3,500
Construction engineering/administration costs	
Ponds	\$5,250
Erosion control	\$31,320
Sub-total	\$36,570
Right of way costs (land-related only)	
Ponds	\$115,200
Wetlands (credits)	\$594,230
Sub-total	\$709,430
Construction costs	
Ponds	\$43,770
Erosion control	\$261,040
Sub-total	\$304,810
Total environmental mitigation costs	\$1,055,760
Right of way	
Total project right of way costs (land only)	\$1,701,710
Wetland (credits)	\$594,230
Total Right of Way costs:	\$2,295,940
Project delivery costs (Engineering)	
Preconstruction engineering	\$1,338,740
Construction engineering/administration	\$2,008,110
Total Engineering costs:	\$3,346,850
Total project cost	
Right of way	\$ 2,295,940
Construction	\$16,734,230
Engineering	\$3,346,850
Total project costs:	\$22,377,020
Percentage of project costs incurred for environmental mitigation and compliance (\$1,055,760 divided by \$22,377,020):	4.7%

Trunk Highway Fund Expenditures

The following contains fiscal year 2014 cost information for each of the categories specified in Minn. Stat. 161.08, subd. 2. The table lists expenditures by category. A brief explanation follows, describing what is included in each cost category.

Trunk highway fund expenditures by category:

1	Road construction	\$ 957.6
2	Design and engineering	\$ 198.4
3	Labor	\$ 370.9
4	Acquisition of right of way	\$ 65.9
5	Litigation	\$ 3.0
6	Maintenance	\$ 95.1
7	Road operations	\$ 225.7
8	Planning	\$ 13.6
9	Environmental compliance	\$ 13.6
10	Administration	\$ 88.0

In \$ millions

1. Road construction costs include all actual costs and encumbrances for road and bridge construction contracts. It includes both the design and engineering and construction cost portions of design/build contracts.
2. Design and engineering costs include all costs and encumbrances for design, pre-design, construction, and other engineering activities performed internally by MnDOT employees and by consultants.
3. Labor costs include all MnDOT expenditures to pay MnDOT employees their wages and salaries including overtime and benefits for full-time, part-time, and unclassified employees.
4. Right of way acquisition costs include all costs and encumbrances to acquire and manage land assets for the trunk highway system.
5. Litigation costs include the following: payments to the State Attorney General's Office for legal services, costs paid for expert witness fees, court reporters and transcribers, tort claims, and general and administrative costs related to legal services.
6. Maintenance costs include all costs and encumbrances to operate and maintain the trunk highway system.
7. Road operations costs are all costs and encumbrances related to such activities as snow removal, rest area maintenance, traffic management, and traveler information.

8. Planning costs are all costs for planning related to construction and maintenance of the trunk highway system, paid either to MnDOT employees or consultants.
9. Environmental compliance costs are the costs derived from the completion of environmental review processes and documentation of the results of those processes, such as environmental assessment worksheets and environmental impact statements. Both internal employee and consultant costs are included.
10. Administration costs include all general and administrative costs related to the construction, maintenance and general support of the trunk highway system.

PLEASE NOTE:

- Debt service is not included in the road construction category.
- These 10 categories, required by the statute, do not represent all Trunk Highway Fund expenditures.
- These 10 categories are not mutually exclusive; some expenditures may be reported in more than one category, such as labor and road operations.

Systems Evaluations

This year's report includes an evaluation of MnDOT's pavement management and bridge management systems, as required in Minn. Stat. 174.56. These evaluations were conducted by MnDOT's internal audit office and specify the extent to which the management of data in these systems is consistent with existing policies and the need for statewide, reliable and verifiable information.

Pavement management system

The evaluation performed on the pavement management system used by MnDOT involved developing a reasonable assurance that the data within the system satisfied the need for statewide, reliable and verifiable information. Internal controls were also reviewed for proper design and implementation. As appropriate, detection of fraud, abuse and illegal acts were also considered. The Office of Materials and Road Research, along with procedures and guidelines applicable to the pavement management system, were also tested.

A sample was collected from the pavement management system to ensure data was reliable, verifiable and accurate. To obtain the most relevant information, a sample of the highway road segments recorded for pavement conditions during the 2012 season was collected.

This audit was performed in accordance with applicable laws and regulations, including Generally Accepted Government Auditing Standards. The standards are used as a guideline to ensure adequate and appropriate evidence was obtained to provide an objective analysis regarding program economy, efficiency and effectiveness of MnDOT's pavement management system. We believe that the evidence obtained provided a reasonable basis for our findings and conclusions based on our audit objectives.

Results

The objectives of this audit were limited and included gaining an understanding of internal controls and procedures related to the operations and usage of the pavement management system. These objectives also determined any significant weaknesses in the internal controls and procedures related to the operations and usage of the pavement management system.

The audit program was designed to determine the adequacy of controls and the appropriateness of the conduct and responsibilities exercised by users and operators of the pavement management system. Other factors considered were:

- 1) The system was working as designed
- 2) The system was being monitored properly and reviewed on a timely basis
- 3) Data was being input according to system manuals, guidelines, and procedures
- 4) All other applicable laws, regulations and administrative requirements were followed

The evaluation of the pavement management system concluded that the data in the system was consistent with the existing policies and satisfied the need for statewide, reliable and verifiable

information. The pavement management system is an adequate system with proper oversight and internal controls, resulting in reliable data for users.

The results of this audit were discussed with Office of Materials and Road Research management at an exit conference. Areas related to the pavement management system were discussed with management during this exit conference to provide considerations in further strengthening the internal controls regarding the pavement management system's operations.

Possible system improvements

Create a comprehensive business manual for pavement management system

Adequate documentation was provided throughout the audit that users and operators of the pavement management system could reference to accomplish system missions, goals and objectives.

At the time of this audit, however, there was no standardized manual consolidating these references. Other MnDOT entities (Business/Administration, Right of Way) with wide-ranging functions develop and preserve manuals in order to maintain consistency throughout the entire department. The absence of a standardized Pavement Management System Manual can result in increased risks. As a result of not having a standardized manual, the following risks can escalate to higher levels:

- Lack of accountability
- Unintended usage and manipulation of the system's data
- Inaccurate data

To mitigate risks and maintain consistent operations, management should consider developing and implementing a Pavement Management System Manual that consolidates guidelines, policies, procedures, processes, and requirements applicable to system usage and operations.

Reassess using two separate indexes for calculations

Two indexes were developed to quantify pavement roughness: International Roughness Index and Ride Quality Index. The IRI rates are in the form of a number and the RQI rates are in the form of a rating scale. The complexity of the IRI methods made it difficult to explain and report the condition of the pavement roughness to customers (Minnesota citizens traveling on trunk highway pavements), so the RQI was developed to meet these demands. The IRI methods are universal and federally regulated, whereas the RQI methods are more subjective and calculated differently among transportation departments.

Since the RQI and IRI both represent pavement roughness, consistency is maintained by including the IRIs recorded in the wheel paths in calculations for both indexes. However, the IRIs that are recorded in the wheel paths of the inspection vehicles are represented differently in the IRI and RQI figures portrayed in the pavement management system. The calculation used to reach the IRI figure includes the average of the IRIs recorded in the left and right wheel paths. The calculation used to reach the RQI figure only accounts for the IRI recorded in the left wheel path.

Those responsible for MnDOT pavement management system operations should consider performing current, up-to-date assessments to determine whether or not the indexes used to portray pavement conditions in the pavement management system, along with the methods used to reach them, continue to provide an accurate representation of the actual pavement conditions of the state's trunk highways.

Materials and Road Research will verify the outcome and that the items discussed above do not affect the data and concur with the conclusion.

Bridge management system

The bridge management system was audited to determine if system data is consistent with existing policies and satisfies the need for statewide, reliable and verifiable information.

Internal controls associated with the MnDOT Bridge Office were reviewed for proper design and implementation. As appropriate, detection of fraud, abuse and illegal acts was considered. Guidelines and procedures applicable to the bridge management system were also tested for reasonableness.

A sample of state owned bridges from the system's data entry tool (Structure Information Management System, or SIMS) was tested to ensure data was reliable, verifiable and accurate. To obtain the most relevant information, structures from the system's 2013 season (March 2013 – February 2014) were chosen as samples.

This audit was performed in accordance with applicable laws and regulations, including Generally Accepted Government Auditing Standards. The standards were used as a guideline to perform this audit to ensure adequate and appropriate evidence was obtained to provide an objective analysis regarding program economy, efficiency and effectiveness of MnDOT's bridge management system.

Results

The processing of the bridge management system data is consistent with existing policies, satisfies the need for statewide, reliable and verifiable information, and internal controls are properly designed and implemented. The bridge management system is an adequate system with proper oversight and internal controls, resulting in reliable data for users.

The results of this audit were addressed with MnDOT Bridge Office personnel at an exit conference, and additional control activities were discussed to further strengthen internal controls. MnDOT Bridge Office personnel were accepting of these considerations and open to implementation processes.

Possible system improvements

Potential for additional attestations from system users

After reviewing individuals' access to the system's data entry tool SIMS (Structure Information Management System), there were two areas where additional attestations from system users should be considered:

- 1) Attestations for external users. All MnDOT employees adhere to the MnDOT Code of Ethics. When users outside of MnDOT having to meet/adhere to this same requirement inquired about SIMS, nothing was provided. It is reasonable to assume external users have their own ethical directives; however, since they have access to a MnDOT-based system (SIMS), there should be attestations from them similar to the MnDOT Code of Ethics. This would create a more consistent accountability level among system users inside and outside of the department.
- 2) Separation of duties. Of the more than 800 individuals with access to the bridge management system's data entry tool (SIMS), a little more than 5 percent (48) had roles that granted them the capability to submit, review and approve inspection report data. Audit tests did not find significant material concerns, but it is still a risk that management should take into consideration. Additional attestations from these individuals stating their awareness of having these privileges and what they will do to properly separate them would mitigate the risks involved.

Management should consider additional attestations during the annual system "reboot" to mitigate these risks and further strengthen the internal controls encompassing the bridge management system.

Products and services budget and spending

Over the past two years, MnDOT worked to modify and improve the products and services grid. MnDOT is the only state agency required to report budget and expenditures by products and services, therefore there is no existing framework or technology to support this work. MnDOT has been developing this framework and support technology over the past two years with additional work yet to complete.

The budget and spending information in this section is for fiscal year 2014. In 2014, MnDOT revised the products and services and developed an application outside of SWIFT to track and report the budget and spending data.

Methodology

The financial information is presented by MnDOT office and district. Spending for each office and district is shown by MnDOT's new list of products and services. This allows the reader to understand how each office and district contributes to the products and services that MnDOT delivered. Budget and expenditure amounts include bond proceeds.

Notes about the data

- Timing differences between the two years of a biennium cause variances that would not be present if the report was prepared on a biennial basis. For example, carry over from the first year of the biennium to the second year impacts second year data.
- Some spending may not match budgets exactly because funds may have been encumbered in one year and expended in another.
- Uncommitted and carry-over budgets may exhibit spending exceeding the total budget. This spending occurs within a biennium and is allowed by statute.

Agency Overhead

Agency overhead includes services such as: leave time, fleet support, buildings, building services and maintenance, finance and accounting, human resources and workforce relations, training, supervision, IT, inventory and equipment, legal services, government relations, audit, research, communication, citizen participation, customer relations, management and administration.

Negative Amounts

Negative spending amounts exist when corrections from the prior period are made in the current period.

2014 products and services summary

Summary	Total	
	Budget	Spent
Products and Services		
Airports	107,262	38,681
Aviation Safety Operations and Regulation	15,031	13,472
Bicycle and Pedestrian Planning and Grants	66	0
Bridges and Structures Inspection and Maintenance	8,833	8,317
Commercial Truck and Bus Safety	3,645	3,428
County State Aid Highway	865,970	775,858
Develop Highway Improvement Projects	55,047	59,091
External Partner Support	117,505	87,024
Freight Rail Improvements	2,817	1,686
Freight System Planning	576	351
Highway Construction Management Oversight	33,574	41,697
Intercity Passenger Rail Improvement	9,069	1,971
Light and Commuter Rail	18,884	559
Municipal State Aid Highway	156,022	163,455
Other Trunk Highway System Improvements	151,504	235,283
Plan Highway System	26,628	15,975
Port Improvements	609	393
Radio Towers and Communications	11,968	27,023
Rail Crossing Safety	8,196	7,491
Research and Development	13,462	7,631
Roadside and Auxiliary Infrastructure	15,337	13,933
Snow and Ice	21,475	29,642
System Roadway Structures Maintenance	29,052	26,054
Traffic Devices Operation and Maintenance	28,571	29,102
Transit Planning and Grants	130,515	115,012
Trunk Highway Debt Service	158,417	144,282
Trunk Highway System Expansion	465,906	352,611
Trunk Highway System Preservation	629,174	467,267
Direct Summary	3,085,115	2,667,289
Agency Overhead	414,937	383,215
Grand Total	3,500,051	3,050,503

Note: The summary totals listed above include items such as: workers compensation, severance (medical portion), unemployment and risk/reserve, which are not included in the division summary charts that follow.

- Budget: 19,669
- Spent: 8,875

Note: The dollar amounts listed in all tables are in thousands. Totals may not add due to rounding.

Summary	Chief Counsel Division		Chief of Staff Division		Commissioners Office Division	
	Budget	Spent	Budget	Spent	Budget	Spent
Products and Services						
Airports						
Aviation Safety Operations and Regulation						
Bicycle and Pedestrian Planning and Grants						
Bridges and Structures Inspection and Maintenance						
Commercial Truck and Bus Safety						
County State Aid Highway						
Develop Highway Improvement Projects	748	687	82			
External Partner Support						
Freight Rail Improvements						
Freight System Planning						
Highway Construction Management Oversight	431	474				
Intercity Passenger Rail Improvement						
Light and Commuter Rail						
Municipal State Aid Highway						
Other Trunk Highway System Improvements						
Plan Highway System	2,482	1,577				
Port Improvements						
Radio Towers and Communications						
Rail Crossing Safety						
Research and Development						
Roadside and Auxiliary Infrastructure						
Snow and Ice						
System Roadway Structures Maintenance						
Traffic Devices Operation and Maintenance						
Transit Planning and Grants						
Trunk Highway Debt Service						
Trunk Highway System Expansion						
Trunk Highway System Preservation						
Direct Summary	3,661	2,738	82	0	0	0
Agency Overhead	4,589	4,709	3,811	3,677	3,201	2,921
Grand Total	8,250	7,447	3,893	3,677	3,201	2,921

Note: The dollar amounts listed in all tables are in thousands. Totals may not add due to rounding.

Summary	Corporate Services Division		Engineering Services Division		Modal Planning & Program Management	
	Budget	Spent	Budget	Spent	Budget	Spent
Products and Services						
Airports					107,262	38,681
Aviation Safety Operations and Regulation					15,031	13,472
Bicycle and Pedestrian Planning and Grants					66	
Bridges and Structures Inspection and Maintenance			1,574	1,199		
Commercial Truck and Bus Safety					3,645	3,428
County State Aid Highway					1,864	877
Develop Highway Improvement Projects	380	556	20,056	19,593	683	547
External Partner Support	25	231	99,849	72,289	1,708	1,627
Freight Rail Improvements					2,817	1,686
Freight System Planning					576	351
Highway Construction Management Oversight	261	460	6,379	6,995	64	
Intercity Passenger Rail Improvement					9,069	1,971
Light and Commuter Rail					18,884	559
Municipal State Aid Highway						
Other Trunk Highway System Improvements			18	56	33,865	15,534
Plan Highway System	51	26	3,501	991	17,935	10,318
Port Improvements					609	393
Radio Towers and Communications						
Rail Crossing Safety					8,196	7,491
Research and Development	13	2	3,723	1,096	4,715	4,040
Roadside and Auxiliary Infrastructure			302	295		
Snow and Ice			31	34		
System Roadway Structures Maintenance			1			
Traffic Devices Operation and Maintenance			250	(186)		234
Transit Planning and Grants					130,515	115,012
Trunk Highway Debt Service					158,417	144,282
Trunk Highway System Expansion					9,751	3,542
Trunk Highway System Preservation			63	7	99,016	15,349
Direct Summary	730	1,275	135,747	102,369	624,688	379,394
Agency Overhead	56,537	56,975	30,188	28,403	13,129	11,033
Grand Total	57,267	58,250	165,935	130,772	637,817	390,427

Note: The dollar amounts listed in all tables are in thousands. Totals may not add due to rounding.

Summary	Operations Division		State Aid for Local Transportation Division	
	Budget	Spent	Budget	Spent
Products and Services				
Airports				
Aviation Safety Operations and Regulation				
Bicycle and Pedestrian Planning and Grants				
Bridges and Structures Inspection and Maintenance	7,259	7,118		
Commercial Truck and Bus Safety				
County State Aid Highway			864,106	774,981
Develop Highway Improvement Projects	33,098	37,708		
External Partner Support	13,703	10,003	2,220	2,874
Freight Rail Improvements				
Freight System Planning				
Highway Construction Management Oversight	26,439	33,768		
Intercity Passenger Rail Improvement				
Light and Commuter Rail				
Municipal State Aid Highway			156,022	163,455
Other Trunk Highway System Improvements	117,621	219,693		
Plan Highway System	2,659	3,063		
Port Improvements				
Radio Towers and Communications			11,968	27,023
Rail Crossing Safety				
Research and Development	5,011	2,493		
Roadside and Auxiliary Infrastructure	15,035	13,638		
Snow and Ice	21,444	29,608		
System Roadway Structures Maintenance	29,051	26,054		
Traffic Devices Operation and Maintenance	28,321	29,054		
Transit Planning and Grants				
Trunk Highway Debt Service				
Trunk Highway System Expansion	456,155	349,069		
Trunk Highway System Preservation	530,095	451,911		
Direct Summary	1,285,891	1,213,180	1,034,316	968,333
Agency Overhead	277,352	254,942	6,461	11,680
Grand Total	1,563,243	1,468,122	1,040,777	980,013

Note: The dollar amounts listed in all tables are in thousands. Totals may not add due to rounding.

Chief Counsel Division Products and Services	Chief Counsel		Civil Rights		Total	
	Budget	Spent	Budget	Spent	Budget	Spent
Develop Highway Improvement Projects			748	687	748	687
Highway Construction Management Oversight			431	474	431	474
Plan Highway System			2,482	1,577	2,482	1,577
Direct Summary	0	0	3,661	2,738	3,661	2,738
Agency Overhead	3,801	3,949	788	760	4,589	4,709
Grand Total	3,801	3,949	4,449	3,498	8,250	7,447

Chief of Staff Division Products and Services	Chief of Staff		Communications		Customer Relations		Government Affairs		Ombudsman		Total	
	Budget	Spent	Budget	Spent	Budget	Spent	Budget	Spent	Budget	Spent	Budget	Spent
Develop Highway Improvement Projects			82								82	
Direct Summary	0	0	82	0	0	0	0	0	0	0	82	0
Agency Overhead	517	481	1,081	1,112	975	894	748	790	490	400	3,811	3,677
Grand Total	517	481	1,163	1,112	975	894	748	790	490	400	3,893	3,677

Commissioner's Office Division Products and Services	Audit		Commissioner's Staff		Total	
	Budget	Spent	Budget	Spent	Budget	Spent
Agency Overhead	1,689	1,666	1,512	1,255	3,201	2,921
Grand Total	1,689	1,666	1,512	1,255	3,201	2,921

Note: The dollar amounts listed in all tables are in thousands. Totals may not add due to rounding.

Corporate Services Division Products and Services	Administration		Affirmative Action		Financial Management		Human Resources	
	Budget	Spent	Budget	Spent	Budget	Spent	Budget	Spent
Develop Highway Improvement Projects							380	556
External Partner Support	25	231						
Highway Construction Management Oversight							261	460
Plan Highway System							51	26
Research and Development							13	2
Direct Summary	25	231	0	0	0	0	705²	1,044³
Agency Overhead	11,226	11,041	497	509	10,066	8,612	5,018	4,852
Grand Total	11,251	11,272	497	509	10,066	8,612	5,723	5,896

Corporate Services Division Products and Services	Information & Technology Services		Corporate Services Division Administration		Total	
	Budget	Spent	Budget	Spent	Budget	Spent
Develop Highway Improvement Projects					380	556
External Partner Support					25	231
Highway Construction Management Oversight					261	460
Plan Highway System					51	26
Research and Development					13	2
Direct Summary	0	0	0	0	730	1,275
Agency Overhead	21,827	24,471	7,903	7,490	56,537	56,975
Grand Total	21,827	24,471	7,903	7,490	57,267	58,250

² Budget amounts in Human Resources for the listed products and services are primarily due to the direct expenses related to the Graduate Engineering Program.

³ Spent amounts in Human Resources for the listed products and services are primarily due to the direct expenses related to the Graduate Engineering Program.

Engineering Services Division	Bridges		Construction & Innovative Contracting		Environmental Stewardship		Land Management		
	Products and Services	Budget	Spent	Budget	Spent	Budget	Spent	Budget	Spent
Bridges and Structures Inspection and Maintenance	836	891							
Develop Highway Improvement Projects	3,851	3,955	413	359	2,129	1,696	4,900	4,690	
External Partner Support	99,386	71,509	76	91	366	95	24	103	
Highway Construction Management Oversight	940	896	1,076	1,340	81	99	577	313	
Other Trunk Highway System Improvements									
Plan Highway System	4	14			156	266	24	19	
Research and Development	108	105			2	20			
Roadside and Auxiliary Infrastructure	10				81	83	209	212	
Snow and Ice					31	34			
System Roadway Structures Maintenance					1				
Traffic Devices Operation and Maintenance	1					3			
Trunk Highway System Preservation									
Direct Summary	105,136	77,370	1,565	1,790	2,847	2,296	5,734	5,337	
Agency Overhead	4,097	3,914	1,823	1,539	2,049	2,169	4,230	4,275	
Grand Total	109,233	81,284	3,388	3,329	4,896	4,465	9,964	9,612	

Note: The dollar amounts listed in all tables are in thousands. Totals may not add due to rounding.

Engineering Services Division Products and Services	Materials & Road Research		Project Management and Technical Support		Engineering Services Division Administration		Total	
	Budget	Spent	Budget	Spent	Budget	Spent	Budget	Spent
Bridges and Structures Inspection and Maintenance			738	308			1,574	1,199
Develop Highway Improvement Projects	2,155	1,821	6,608	7,072			20,056	19,593
External Partner Support	(3)	471		20			99,849	72,289
Highway Construction Management Oversight	2,555	3,123	1,150	1,224			6,379	6,995
Other Trunk Highway System Improvements			18	56			18	56
Plan Highway System	2,396	(2)	921	694			3,501	991
Research and Development	3,115	597	498	374			3,723	1,096
Roadside and Auxiliary Infrastructure			2				302	295
Snow and Ice							31	34
System Roadway Structures Maintenance							1	0
Traffic Devices Operation and Maintenance			249	(189)			250	(186)
Trunk Highway System Preservation			63	7			63	7
Direct Summary	10,218	6,010	10,247	9,566	0	0	135,747	102,369
Agency Overhead	5,254	5,507	11,802	10,294	933	705	30,188	28,403
Grand Total	15,472	11,517	22,049	19,860	933	705	165,935	130,772

Note: The dollar amounts listed in all tables are in thousands. Totals may not add due to rounding.

Modal Planning & Program Management Division	Aeronautics		Freight & Commercial Vehicle Operations		Passenger Rail		Transit		
	Products and Services	Budget	Spent	Budget	Spent	Budget	Spent	Budget	Spent
Airports	107,262	38,681							
Aviation Safety Operations and Regulation	15,031	13,472							
Bicycle and Pedestrian Planning and Grants							66		
Commercial Truck and Bus Safety			3,645	3,428					
County State Aid Highway							1,864	877	
Develop Highway Improvement Projects									1
External Partner Support	9	7	1,000	984		26	44	83	
Freight Rail Improvements			2,817	1,686					
Freight System Planning			576	351					
Highway Construction Management Oversight									
Intercity Passenger Rail Improvement					9,069	1,971			
Light and Commuter Rail							18,884	559	
Other Trunk Highway System Improvements									
Plan Highway System									4
Port Improvements			609	393					
Rail Crossing Safety			8,196	7,491					
Research and Development									
Traffic Devices Operation and Maintenance									
Transit Planning and Grants							130,515	115,012	
Trunk Highway Debt Service									
Trunk Highway System Expansion									
Trunk Highway System Preservation									
Direct Summary	122,302	52,160	16,843	14,333	9,069	1,997	151,373	116,536	
Agency Overhead	3,119	2,689	2,867	2,393	242	134	1,147	1,611	
Grand Total	125,421	54,849	19,710	16,726	9,311	2,131	152,520	118,147	

Note: The dollar amounts listed in all tables are in thousands. Totals may not add due to rounding.

Modal Planning & Program Management Division Products and Services	Transportation System Management		Modal Planning & Program Management Division Administration		Total	
	Budget	Spent	Budget	Spent	Budget	Spent
Airports					107,262	38,681
Aviation Safety Operations and Regulation					15,031	13,472
Bicycle and Pedestrian Planning and Grants					66	
Commercial Truck and Bus Safety					3,645	3,428
County State Aid Highway					1,912	887
Develop Highway Improvement Projects	683	546			683	547
External Partner Support	655	527			1,708	1,627
Freight Rail Improvements					2,817	1,686
Freight System Planning					576	351
Highway Construction Management Oversight	64				64	
Intercity Passenger Rail Improvement					9,311	2,105
Light and Commuter Rail					18,884	559
Other Trunk Highway System Improvements	33,865	15,534			33,865	15,534
Plan Highway System	17,935	10,314			17,935	10,318
Port Improvements					609	393
Rail Crossing Safety					8,196	7,491
Research and Development	4,715	4,040			4,715	4,040
Traffic Devices Operation and Maintenance		234				234
Transit Planning and Grants					130,515	115,012
Trunk Highway Debt Service	158,417	144,282			158,417	144,282
Trunk Highway System Expansion	9,751	3,542			9,751	3,542
Trunk Highway System Preservation	99,016	15,349			99,016	15,349
Direct Summary	325,101	194,368	0	0	624,978	379,538
Agency Overhead	4,879	3,484	875	722	12,839	10,889
Grand Total	329,980	197,852	875	722	637,817	390,427

Note: The dollar amounts listed in all tables are in thousands. Totals may not add due to rounding.

Operations Division	District 1		District 2		District 3		District 4		District 6	
	Budget	Spent	Budget	Spent	Budget	Spent	Budget	Spent	Budget	Spent
Products and Services										
Bridges and Structures Inspection and Maintenance	872	759	416	389	475	585	220	249	1,085	1,076
Develop Highway Improvement Projects	3,439	3,452	1,936	2,345	3,086	3,099	1,887	2,201	3,450	5,351
External Partner Support	867	604	18	18	8	26			747	784
Highway Construction Management Oversight	3,129	3,332	1,546	1,530	2,604	2,525	1,578	2,093	3,272	3,884
Other Trunk Highway System Improvements	5,251	822	2,468	3,687	12,904	25,150	7,663	6,622	7,853	24,520
Plan Highway System	127	157	163	231	210	236	98	112	296	547
Research and Development	5	14	1		1		1		9	5
Roadside and Auxiliary Infrastructure	926	625	927	895	943	792	696	628	1,334	1,106
Snow and Ice	2,375	3,403	1,769	2,107	2,584	3,662	1,977	2,269	2,528	3,704
System Roadway Structures Maintenance	2,980	2,699	1,756	1,493	3,662	3,248	2,440	1,950	3,569	3,236
Traffic Devices Operation and Maintenance	1,125	1,066	671	565	1,552	1,471	679	756	1,803	1,895
Trunk Highway System Expansion	12,339	8,488	806	467	18,594	9,918	656	1,796	60,420	58,226
Trunk Highway System Preservation	52,740	69,157	30,942	35,309	47,572	56,803	49,232	44,142	98,623	61,193
Direct Summary	86,175	94,578	43,419	49,036	94,195	107,515	67,127	62,818	184,989	165,527
Agency Overhead	26,186	25,855	14,261	14,917	23,245	24,484	16,650	16,534	24,888	26,003
Grand Total	112,361	120,433	57,680	63,953	117,440	131,999	83,777	79,352	209,877	191,530

Note: The dollar amounts listed in all tables are in thousands. Totals may not add due to rounding.

Operations Division	District 7		District 8		Metro District		Maintenance	
	Budget	Spent	Budget	Spent	Budget	Spent	Budget	Spent
Products and Services								
Bridges and Structures Inspection and Maintenance	707	643	506	462	2,969	2,939	5	16
Develop Highway Improvement Projects	2,198	2,898	1,599	1,422	15,206	16,564		
External Partner Support					12,037	8,461		
Highway Construction Management Oversight	2,026	2,342	1,564	1,460	10,653	15,867		
Other Trunk Highway System Improvements	11,178	14,131	6,016	6,535	49,298	129,528		
Plan Highway System	199	171	439	304	1,076	1,214		
Research and Development	2		2		569	452		
Roadside and Auxiliary Infrastructure	1,117	924	465	466	4,153	3,910	4,474	4,292
Snow and Ice	1,867	2,596	1,007	1,639	6,715	9,692	621	536
System Roadway Structures Maintenance	3,430	2,603	1,742	1,544	9,464	9,280	8	1
Traffic Devices Operation and Maintenance	910	801	557	612	13,048	13,788	6,035	5,736
Trunk Highway System Expansion	33,202	14,677	2,354	(347)	325,684	255,844	1,100	
Trunk Highway System Preservation	42,607	73,000	41,378	41,306	162,401	69,922	1,100	
Direct Summary	99,443	114,786	57,629	55,403	613,273	537,461	13,343	10,581
Agency Overhead	18,819	18,023	13,084	13,825	71,687	68,587	59,160	41,047
Grand Total	118,262	132,809	70,713	69,228	684,960	606,048	72,503	51,628

Note: The dollar amounts listed in all tables are in thousands. Totals may not add due to rounding.

Operations Division Products and Services	Traffic, Safety & Technology		Operations Division Administration		Total	
	Budget	Spent	Budget	Spent	Budget	Spent
Bridges and Structures Inspection and Maintenance	4				7,259	7,118
Develop Highway Improvement Projects	297	376			33,098	37,708
External Partner Support		85	26	25	13,703	10,003
Highway Construction Management Oversight	67	735			26,439	33,768
Other Trunk Highway System Improvements	14,990	8,698			117,621	219,693
Plan Highway System	51	91			2,659	3,063
Research and Development	4,421	2,022			5,011	2,493
Roadside and Auxiliary Infrastructure					15,035	13,638
Snow and Ice	1				21,444	29,608
System Roadway Structures Maintenance					29,051	26,054
Traffic Devices Operation and Maintenance	1,941	2,364			28,321	29,054
Trunk Highway System Expansion	1,000				456,155	349,069
Trunk Highway System Preservation	3,500	1,079			530,095	451,911
Direct Summary	26,272	15,450	26	25	1,285,891	1,213,180
Agency Overhead	6,029	3,033	3,343	2,634	277,352	254,942
Grand Total	32,301	18,483	3,369	2,659	1,563,243	1,468,122

Note: The dollar amounts listed in all tables are in thousands. Totals may not add due to rounding.

State Aid Division Products and Services	State Aid for Local Transportation		Statewide Radio Communications		Total	
	Budget	Spent	Budget	Spent	Budget	Spent
County State Aid Highway	864,106	774,981			864,106	774,981
External Partner Support	620	812	1,600	2,062	2,220	2,874
Municipal State Aid Highway	156,022	163,455			156,022	163,455
Radio Towers and Communications			11,968	27,023	11,968	27,023
Direct Summary	1,020,748	939,248	13,568	29,085	1,034,316	968,333
Agency Overhead	3,570	8,348	2,891	3,332	6,461	11,680
Grand Total	1,024,318	947,596	16,459	32,417	1,040,777	980,013

Note: The dollar amounts listed in all tables are in thousands. Totals may not add due to rounding.

Productivity Measures

Introduction

Traditional performance measures used by MnDOT are measures of product and service delivery effectiveness. Performance measures have been used at MnDOT since the 1990's. However, productivity measures are still relatively new to the department with December 2014 marking only the second year MnDOT has produced this productivity report. Productivity measures help to evaluate how efficiently MnDOT's products and services are delivered.

Project background

The productivity measures project is an effort to identify, create, examine, and document current levels of productivity within MnDOT for MnDOT's core products and services. This project is aimed at complying with the 2012 legislation requiring the commissioner to annually report measures of MnDOT productivity for the previous fiscal year.

The report includes the following measures reported last year, although the pavement measure has been modified for this year's report:

- Bridges:
 - Inspection cost per square foot of deck area
 - Maintenance cost per square foot of deck area
- Pavement: Cost per additional roadway mile-year added
- Snow and ice: Cost per plow mile driven
- Pavement markings: Cost per mile striped
- Transit: MnDOT administrative cost per transit passenger trip

These areas represent a subset of MnDOT's products and services. New areas will continue to be added in subsequent reports as they are identified.

Purpose and scope

The productivity measures contained in this report were identified and developed by each respective operational area. The data is repeatable, verifiable and auditable. Measures of productivity should be viewed in the context of MnDOT's drive to deliver a safe and reliable multi-modal transportation system for Minnesotans. While measures of effectiveness are not included in this report, they can be found in MnDOT's [Annual Performance Report](http://www.dot.state.mn.us/measures) available at www.dot.state.mn.us/measures.

Costs are presented in both inflation adjusted and unadjusted terms. For measures where the bulk of costs are labor related, a 2 percent inflation factor is used based on historic MnDOT labor inflation rates. For measures where the bulk of costs are maintenances related, a 3 percent inflation factor is used based on average inflation in MnDOT's maintenance and operations commodities and labor from 2006 – 2010. For measures where the bulk of the costs are construction related, actual

MnDOT construction cost index values are used. This index has been volatile but increased an average of 7 percent per year for the last 10 years.

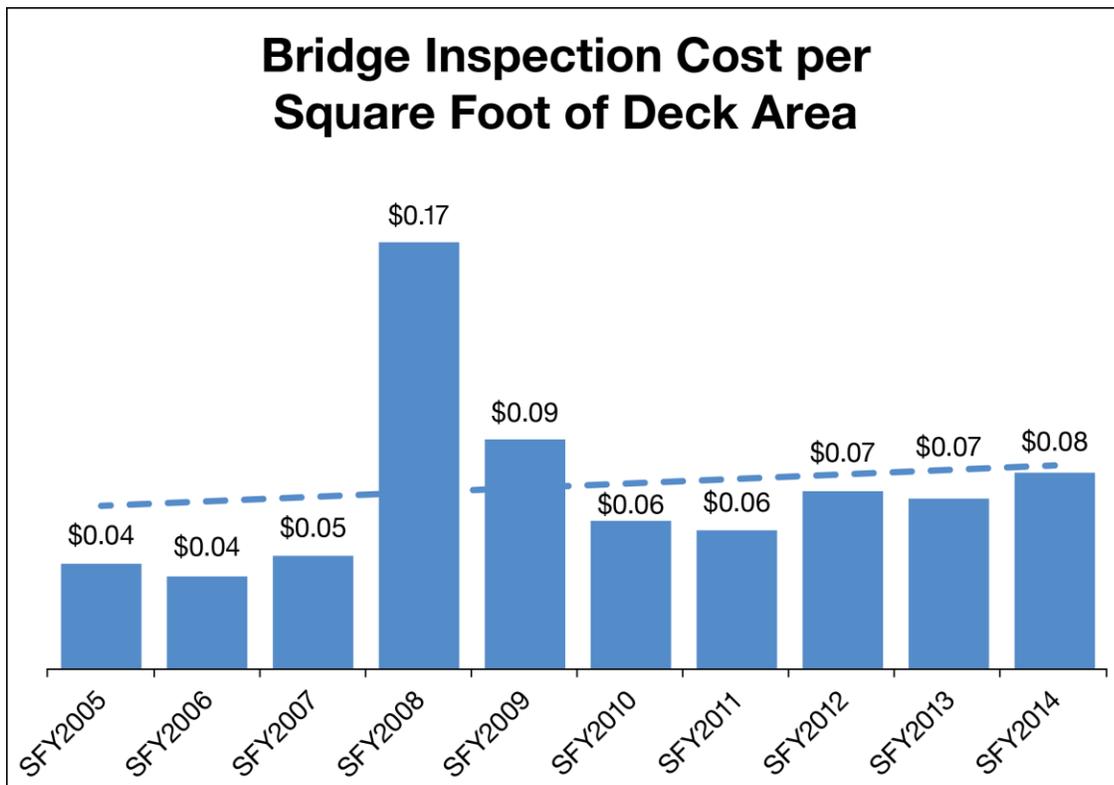
Project challenges

Data used in reports must be repeatable, auditable and tied to the system of record. Subject matter experts identified gaps in the capacity of current systems to track and report data used in measuring productivity. MnDOT continues to identify mitigation strategies to address these challenges and gaps.

Bridges: Inspection cost per square foot of deck area

Bridge inspections ensure bridge safety, keep MnDOT in compliance with state and federal law and provide data to support bridge investment decisions.

The primary costs of delivering a high-quality bridge inspection program are the labor and equipment used to access bridges in order to document their condition. The bridge inspection productivity measure tracks dollars spent on routine and fracture critical bridge inspections against the total deck area of bridges inspected.



The square foot of deck area for 2002–2011 does not include all bridges inspected due to previous cost accounting practices and software limitations. Data from 2012 forward is accurate with regard to both cost and square foot of deck area inspected. Costs were adjusted using a 2 percent annual inflation factor based on historic MnDOT labor inflation.

The cost per square foot for bridge inspections appears to increase over the time period analyzed, although more years of data are needed to accurately establish a trend due to incomplete data from 2002-2011 and the spike in 2008. Bridge inspection expenses and cost per square foot peaked in fiscal year 2008 when the governor mandated accelerated inspections for all bridges. Other primary factors that affected annual costs include:

- 1) A change to the federal National Bridge Inspection Standards, which increased the frequency of Fracture Critical inspections to every 24 months. Previous to 2008 these inspections were performed every 48 months. Fracture Critical inspections take more time and are more expensive per square foot of bridge deck area than routine inspections.
- 2) Age of infrastructure results in more deterioration to monitor and increases inspection times.

- 3) Trends toward new and more complex bridges also add inspection time and create access issues.
- 4) Increases in the necessary amount of traffic control and the cost of equipment.

Inflation-adjusted bridge inspection cost per square foot of deck area

State Fiscal Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Bridge inspection expenses (\$1,000)	\$1,554	\$1,301	\$1,403	\$7,168	\$3,057	\$2,028	\$1,809	\$1,920	\$2,093	\$2,079
Sq. ft. of bridge deck inspected (1,000)	35,468	32,968	29,853	41,050	32,391	32,797	31,471	26,079	29,755	25,538
Cost per sq. ft. of inspection	\$0.044	\$0.039	\$0.047	\$0.175	\$0.094	\$0.062	\$0.057	\$0.074	\$0.070	\$0.081

Costs were adjusted using a 2 percent annual inflation factor based on historic MnDOT labor inflation.

Actual (unadjusted) bridge inspection cost per square foot of deck area

State Fiscal Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Bridge inspection expenses (\$1,000)	\$1,301	\$1,110	\$1,222	\$6,365	\$2,768	\$1,874	\$1,705	\$1,846	\$2,052	\$2,079
Sq. ft. of bridge deck inspected (1,000)	35,468	32,968	29,853	41,050	32,391	32,797	31,471	26,079	29,755	25,538
Cost per sq. ft. of inspection	\$0.037	\$0.034	\$0.041	\$0.155	\$0.085	\$0.057	\$0.054	\$0.071	\$0.069	\$0.081

Numbers within the table are not adjusted for inflation.

Why inspection cost per square foot is a good measure

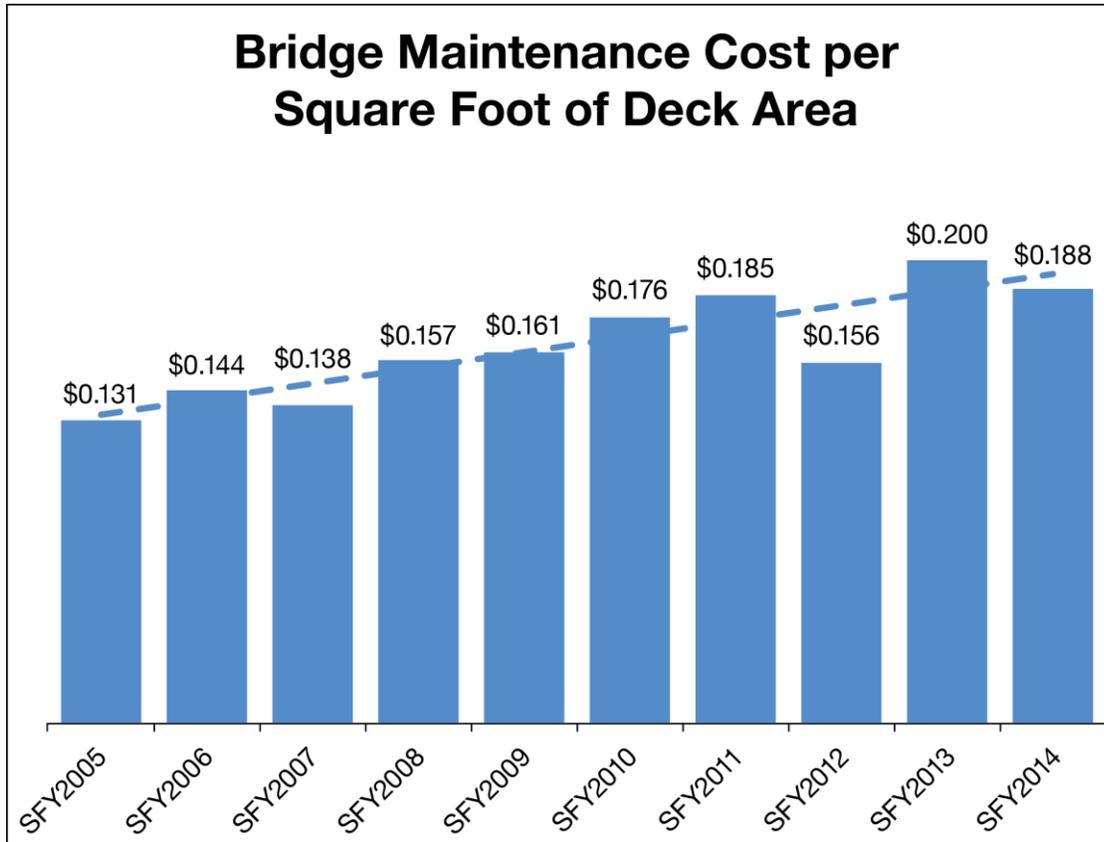
Bridge safety inspections play a key role in maintaining a safe transportation system. They ensure the structural integrity of our bridges and keep MnDOT in compliance with state and federal laws. Bridge inspections also provide the condition assessment data that supports MnDOT investment decisions regarding bridge repair, rehabilitation and replacement. This productivity measure along with our NBIS assessments, biennial Bridge Inspection Quality Assurance reports to the legislature, and MnDOT's performance measures enables MnDOT to gauge the overall effectiveness and productivity of our inspection activities.

Major influencing factors

Primary factors that influence this measure include changes to fracture critical inspection frequency; bridges with advanced deterioration require additional time and effort to inspect; large and complex bridges require more advanced equipment and inspection techniques; and traffic control requirements, access and equipment requirements. Also, since 2012, a possible factor influencing MnDOT time and effort on bridge inspections is the National Bridge Inspection Oversight Program established by FHWA in 2011. This program evaluates state bridge inspection programs for compliance annually using 23 metrics. These metrics were put in place to ensure consistency among states' programs and to ensure bridges are safe, reduce liability for bridge owners and increase public confidence. This program has resulted in more administrative costs to the states, and has possibly impacted the amount of time spent reporting bridge inspection information. Because of the numerous contributing factors, the cost per square foot for bridge inspections is not necessarily directly proportional to the bridge deck area. The reported bridge inspection costs are very high level and are appropriate for monitoring the overall trend.

Bridges: Maintenance cost per square foot of deck area

Bridge maintenance includes both preventive and reactive maintenance. Preventive bridge maintenance includes routine maintenance activities that keep bridges in good condition and extend their service life. Reactive bridge maintenance includes minor repairs to keep bridges safe and ensure that they serve their transportation function with limited service interruptions.



Costs were adjusted using a 3 percent annual inflation factor based on historic MnDOT maintenance and operations commodity and labor inflation.

The bridge maintenance productivity measure compares dollars spent on preventive and reactive maintenance to the deck area of the bridge system. Dividing labor, equipment and material costs over the square footage of bridges demonstrates between \$0.131 and \$0.200 per square foot was spent over the last decade to perform preventive and reactive maintenance. As a reference, it costs an average of \$150 per square foot to construct a new bridge. Note that these average maintenance costs are not necessarily directly proportional to the square footage of the bridge. Many factors affect maintenance costs such as complexity, access, traffic-control requirements, scope of work, equipment requirements, and level of deterioration.

There is a slight upward trend in the square foot cost for bridge maintenance. Increased funding through the HSOP program for bridge preventive maintenance enhanced MnDOT's ability to perform preventive maintenance, which may partially account for this upward trend. Additionally, as the bridge system ages, the amount of reactive maintenance it requires will increase, which may also contribute to this upward trend.

Inflation-adjusted bridge maintenance cost per square foot of deck area

State Fiscal Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Preventive Maintenance Expenditures (\$1,000)	\$2,211	\$2,906	\$3,470	\$4,633	\$4,288	\$3,537	\$3,838	\$3,654	\$2,820	\$2,551
Reactive Maintenance Expenditures (\$1,000)	\$3,779	\$3,725	\$2,907	\$2,780	\$3,365	\$4,809	\$4,977	\$3,783	\$6,711	\$6,478
Total Bridge Deck Sq. Ft. (1,000)	45,630	45,945	46,257	47,124	47,576	47,373	47,531	47,543	47,567	48,034
Maintenance Cost/Sq. Ft.	\$0.131	\$0.144	\$0.138	\$0.157	\$0.161	\$0.176	\$0.185	\$0.156	\$0.200	\$0.188

Costs were adjusted using a 3 percent annual inflation factor based on historic MnDOT maintenance and operations commodity and labor inflation.

Actual (unadjusted) bridge maintenance costs

State Fiscal Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Preventive Maintenance Expenditures (\$1,000)	\$1,645	\$2,227	\$2,739	\$3,767	\$3,591	\$3,051	\$3,410	\$3,344	\$2,658	\$2,477
Reactive Maintenance Expenditures (\$1,000)	\$2,812	\$2,855	\$2,295	\$2,260	\$2,818	\$4,148	\$4,422	\$3,462	\$6,326	\$6,289
Total Bridge Deck Sq. Ft. (1,000)	45,630	45,945	46,257	47,124	47,576	47,373	47,531	47,543	47,567	48,034
Maintenance Cost/Sq. Ft.	\$0.098	\$0.111	\$0.109	\$0.128	\$0.135	\$0.152	\$0.165	\$0.143	\$0.189	\$0.182

Costs are not adjusted for inflation.

Why total maintenance cost per square foot is a good measure

A key component of managing bridges is employing a systematic approach to bridge preservation. Preservation is a program of cyclical and condition-based maintenance activities that keep bridges in sound condition with the intent of slowing their deterioration rate. Preservation activities are categorized as either preventive or reactive maintenance.

- Preventive maintenance includes routine maintenance activities performed according to an assigned frequency, as well as periodic minor repairs. Specific preventive maintenance activities include flushing, painting, joint maintenance, and deck sealing and are generally performed on bridges in good or satisfactory condition.
- Reactive maintenance includes those activities scheduled in response to an identified condition that may compromise public safety or bridge structural function. Specific reactive maintenance activities include repair of the deck, superstructure, and substructure and are generally performed on bridges in fair or poor condition.

Performing preventive maintenance on newer bridges is cost effective and will keep them in good condition longer. Performing reactive maintenance when needed will delay the need for extensive rehabilitation or replacement.

Major influencing factors

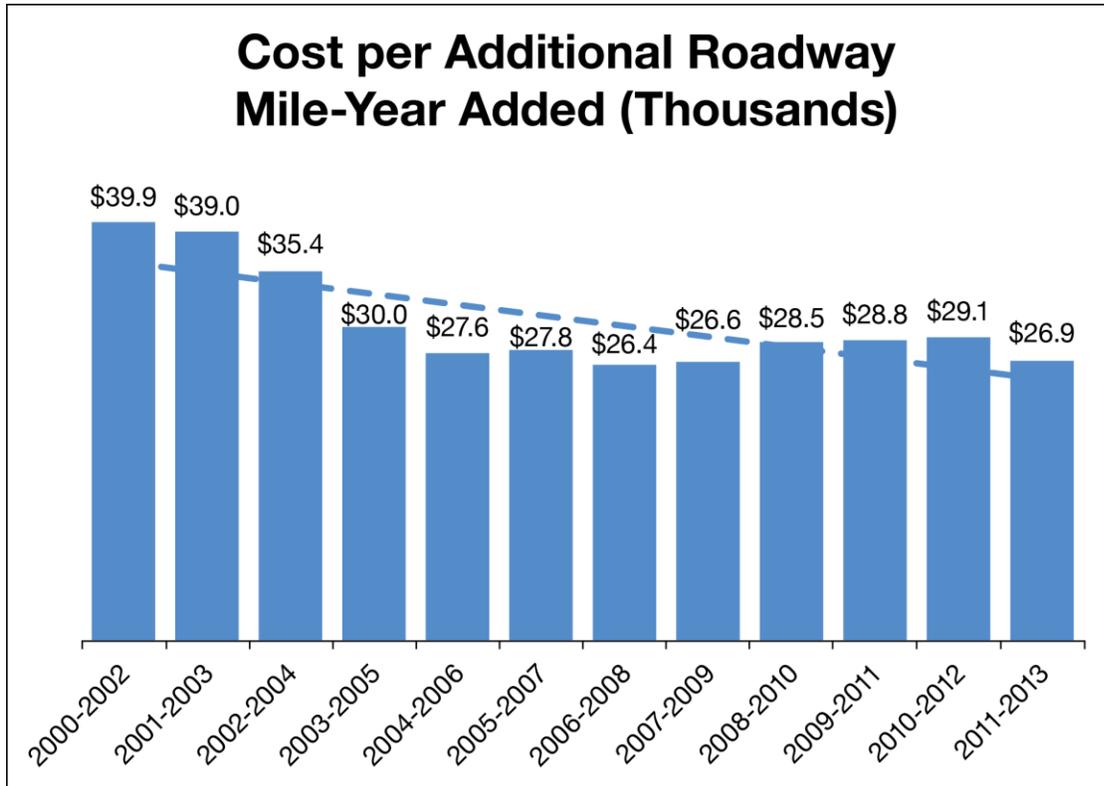
Budget allocations and the condition of Minnesota's overall bridge system are factors that influence this measure. As the condition of our bridge system trends toward good and satisfactory, preventive maintenance becomes the appropriate treatment. As the condition of the bridge system trends toward fair and poor, reactive maintenance needs increase.

Other factors that influence this measure include complexity, traffic control requirements, access, and equipment requirements. Because of the numerous contributing factors, the cost per square foot for bridge maintenance is not necessarily directly proportional to the bridge deck area. These costs are very high level and are appropriate for monitoring the overall trend.

Preservation activities performed by contract are not included, due to current accounting practice. MnDOT generally self-performs the majority of bridge preservation, but future reporting efforts will attempt to include contract maintenance work.

Pavement: Cost per additional roadway mile-year added

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



Costs were adjusted for inflation using the actual annual Pavement Surfacing Index from the MnDOT Construction Cost Index that has been volatile but increased an average of 7 percent per year for the last 10 years.

MnDOT performs a variety of rehabilitation activities that extend life of our roadways. These fixes extend the remaining service life of our roadways and are measured in terms of roadway mile years added. Remaining service life is the time in years until the roughness of a pavement section is predicted to reach the point where travelers feel the road is rough. A roadway with zero years of service life remaining can still be driven on, but it has reached the point when some sort of rehabilitation is warranted. Rehabilitation activities with long service lives will add a considerable number of years to the remaining service life of a pavement but are typically more costly. Less expensive short-term fixes may increase the pavement smoothness in the near term, but will not add many additional years of remaining service life.

Using programmed pavement preservation investment, the cost per additional roadway mile year added is displayed. The investment numbers represent MnDOT's contracted work. Work performed by MnDOT labor is not included. A three year rolling average is used to smooth financial data that is in fiscal years and condition data that is in calendar years. Additionally, any improvement in condition is captured the year after the investment is made.

Inflation-adjusted cost per additional roadway mile-year added

3-year averages	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2007-2009	2008-2010	2009-2011	2010-2012	2011-2013
Pavement Preservation spending (millions)	\$300.4	\$282.1	\$316.3	\$318.4	\$265.8	\$312.8	\$361.9	\$413.0	\$440.0	\$448.5
Mile-Years added	8.5	9.4	11.5	11.4	10.1	11.8	12.7	14.3	15.1	16.7
Cost per roadway mile year added (1000s)	\$35.4	\$30.0	\$27.6	\$27.8	\$26.4	\$26.6	\$28.5	\$28.8	\$29.1	\$26.9

Costs were adjusted for inflation using the actual annual Pavement Surfacing Index from the MnDOT Construction Cost Index that has been volatile but increased an average of 7 percent per year for the last 10 years.

Actual (unadjusted) cost per additional roadway mile-year added

3-year averages	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2007-2009	2008-2010	2009-2011	2010-2012	2011-2013
Pavement Preservation spending (millions)	\$153.3	\$149.7	\$184.8	\$208.8	\$205.0	\$255.9	\$307.3	\$349.8	\$393.2	\$407.0
Mile-Years added	8.5	9.4	11.5	11.4	10.1	11.8	12.7	14.3	15.1	16.7
Cost per roadway mile year added (1000s)	\$18.0	\$15.9	\$16.1	\$18.2	\$20.3	\$21.8	\$24.2	\$24.4	\$26.0	\$24.4

Costs were not adjusted for inflation.

The results show the trend in cost per roadway mile-year added is decreasing over time. It should be noted that this measure only calculates the productivity of the work performed; it does not suggest whether the overall level of investment in the system is adequate.

Why cost per additional roadway mile-year added is a good measure

This measure is a good addition to the suite of pavement measures that have historically focused just on outcomes because it calculates the productivity of the work performed. The measure shows the cost per roadway mile year added through contracted work using a three-year rolling average from state fiscal year 2000 to 2012.

Using programmed pavement preservation investment, the cost per additional roadway mile year added is displayed. The investment numbers represent MnDOT's contracted work for the following program categories: reconstruction, recondition, resurfacing, and road repair. Work performed by MnDOT labor is not included. A three year rolling average is used because financial data is reported by fiscal year whereas condition data is reported by calendar year and any improvement in condition is captured the year after the investment is made. This measure provides a way of looking at the makeup of our pavement program. Long life fixes, while adding considerable life to a roadway, are very costly. Fixes with short lives, while fairly inexpensive, do not add much life to the system. A good balance of long and short term fixes is desired. When budgets are tight, the program will trend toward increased miles of low cost, short life fixes, so as to keep the system in serviceable condition. As funds increase, a greater number of the higher cost, long life fixes can be part of the program.

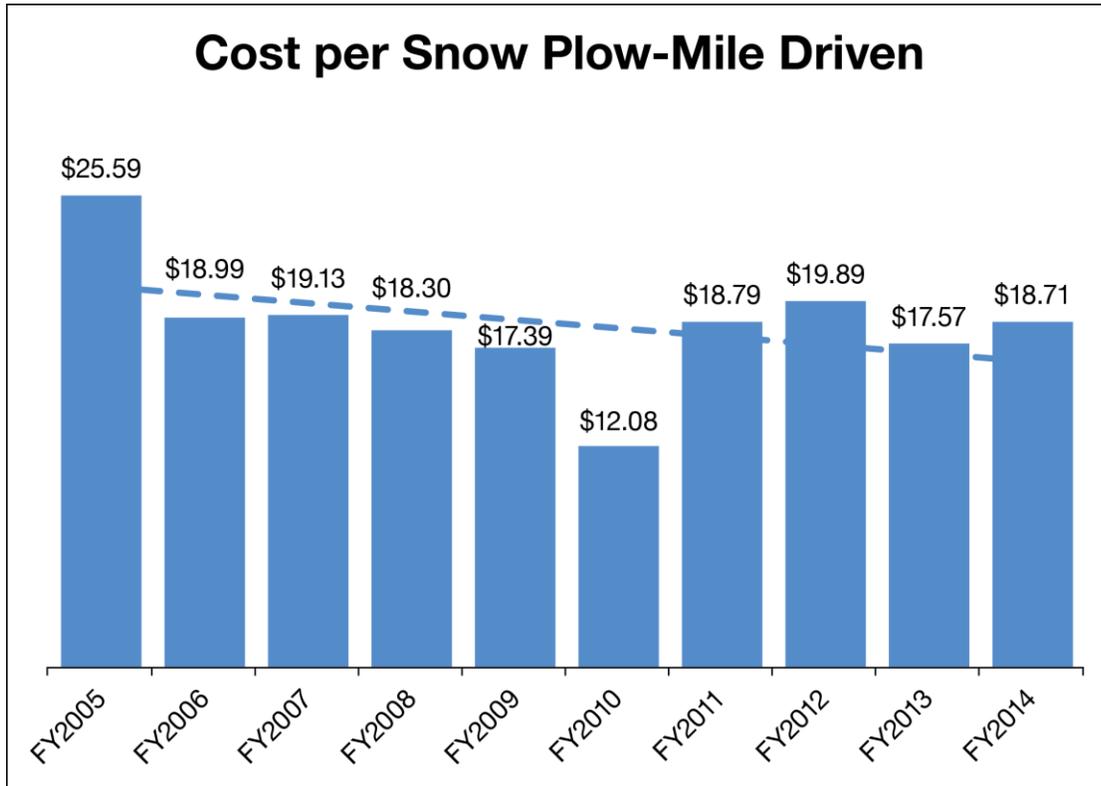
Major influencing factors

Inflation in construction costs is a major influencing factor for MnDOT's construction program. Pavement is especially impacted by inflation since asphalt and concrete prices have increased disproportionately compared to other construction activities in recent history.

In addition, many pavement projects are chosen because of reasons that are not primarily related to pavement condition. Things such as the need to improve safety and/or mobility along a route often are the primary reasons the project is selected. Though the pavement is repaired or replaced as part of the project, the cost of the project is higher, in some cases much higher, due to the non-pavement related work. This makes it difficult to derive a good relationship between the number of years of life added and the dollar spent on pavement repairs. Some years, MnDOT's program has more of these types of projects than others, making it difficult to analyze yearly trends. Finally, as new materials and construction techniques are developed, the lives of the various fixes will hopefully increase, when compared to our current methods. If the added cost of the new method provides a substantial increase in pavement life, it will be reflected by this measure.

Snow and ice: Cost per plow-mile driven

The primary goal of MnDOT's snow and ice operations is the safety of Minnesota's traveling public. 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 an event has passed.



Costs were adjusted using a 3 percent annual inflation factor based on historic MnDOT maintenance and operations commodity and labor inflation.

The chart above shows the cost per plow-mile driven has been stable over eight of the last 10 years. The data includes miles driven to get to and from routes, since those miles are required to deliver snow and ice operations. Many variables such as wind, terrain, congestion, winter severity, winter event timing, and type of weather play into the cost per mile driven. It should be noted that the data is not adjusted for winter severity (snow accumulation, number of snow and freezing rain events, and storm duration).

Inflation-adjusted cost per snow plow-mile driven

State Fiscal Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Costs (\$millions)	\$86.0	\$83.4	\$73.0	\$99.6	\$106.3	\$85.4	\$117.1	\$65.8	\$115.6	\$136.2
Plow Miles Driven (1000s)	3,359	4,389	3,814	5,445	6,111	7,068	6,235	3,306	6,583	7,282
Cost per Mile	\$25.59	\$18.99	\$19.13	\$18.30	\$17.39	\$12.08	\$18.79	\$19.89	\$17.57	\$18.71

Costs were adjusted using a 3 percent annual inflation factor based on historic MnDOT maintenance and operations commodity and labor inflation.

Actual (unadjusted) cost per snow plow-mile driven

State Fiscal Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Costs (\$millions)	\$65.9	\$65.8	\$59.3	\$83.5	\$91.6	\$75.9	\$107.2	\$62.0	\$112.3	\$136.2
Plow Miles Driven (1000s)	3,359	4,389	3,814	5,445	6,111	7,068	6,235	3,306	6,583	7,282
Cost per Mile	\$19.62	\$14.99	\$15.55	\$15.33	\$15.00	\$10.73	\$17.19	\$18.75	\$17.06	\$18.71

Numbers within the table are not adjusted for inflation.

Why cost per plow mile driven is a good measure of productivity

This data focuses on clearing the roadways of snow and ice, MnDOT's most visible operations service.

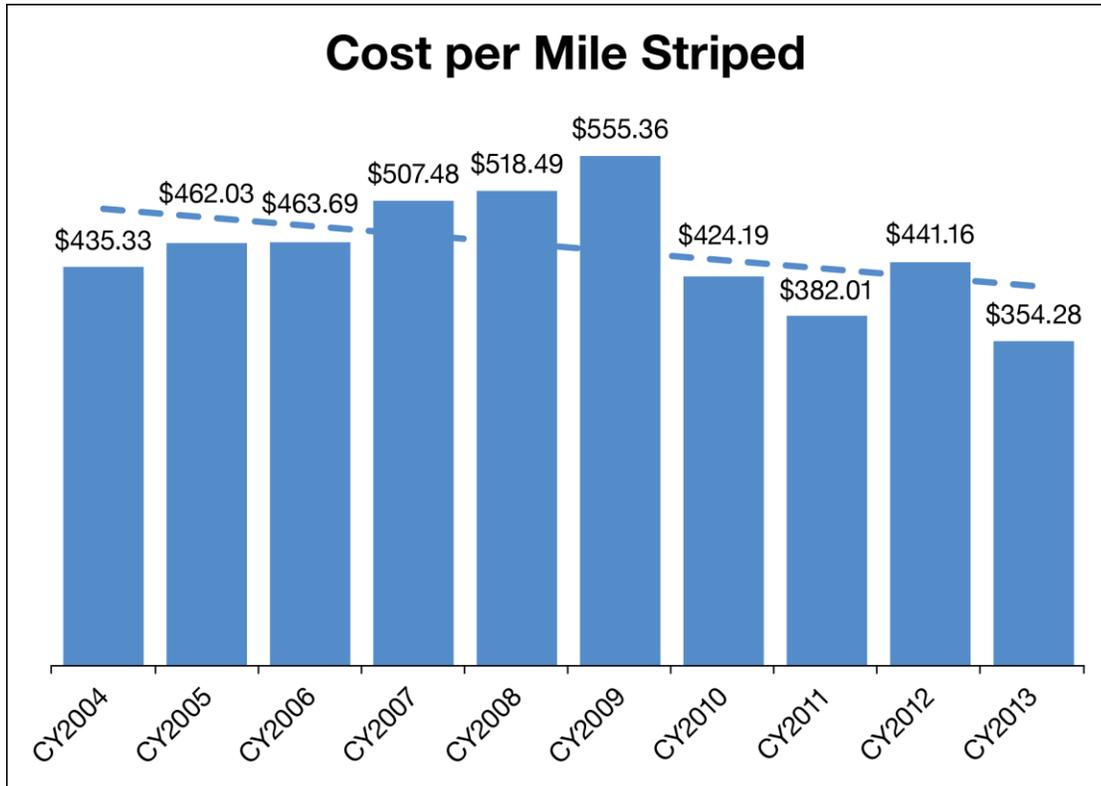
Major influencing factors

Factors that influence higher expenses are congestion, winter severity, type of weather, event timing, wind, clean-up, inventorying materials, maintenance of storage facilities, salt brine production, and terrain. MnDOT is looking at ways to control for more of these factors when measuring productivity.

Contributing to added efficiency are innovative technologies including tow plows, anti-icing, pre-wetting, de-icing, comprehensive snowfighter training and enhanced materials.

Pavement markings: Cost per mile striped

Pavement markings perform an important function in managing, directing and controlling traffic. In some cases, they are used to supplement the regulations or warnings of other devices, such as traffic signs or signals. Sometimes, they are used alone and produce results that cannot be obtained by the use of any other device.



Costs were adjusted using a 3 percent annual inflation factor based on historic MnDOT maintenance and operations commodity and labor inflation.

The chart above shows the cost per mile striped in a calendar year. Striper cost per mile trends downward over the reporting period, though it does fluctuate from year-to-year due to the influencing factors listed below.

Inflation-adjusted cost per mile striped

Calendar Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total Striping Costs (1000s)	\$8,680	\$9,351	\$8,719	\$9,229	\$10,744	\$11,094	\$7,678	\$6,513	\$8,237	\$5,828
Miles Striped (1000s)	19.9	20.2	18.8	18.2	20.7	20.0	18.1	17.0	18.7	16.5
Cost per Mile	\$435.33	\$462.03	\$463.69	\$507.48	\$518.49	\$555.36	\$424.19	\$382.01	\$441.16	\$354.28

Costs were adjusted using a 3 percent annual inflation factor based on historic MnDOT maintenance and operations commodity and labor inflation.

Actual (unadjusted) cost per mile striped

Calendar Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total Striping Costs (1000s)	\$6,459	\$7,167	\$6,883	\$7,504	\$8,998	\$9,570	\$6,822	\$5,960	\$7,764	\$5,658
Miles Striped (1000s)	19.9	20.2	18.8	18.2	20.7	20.0	18.1	17.0	18.7	16.5
Cost per Mile	\$323.92	\$354.11	\$366.04	\$412.63	\$434.22	\$479.06	\$376.88	\$349.59	\$415.84	\$343.96

Costs were unadjusted for inflation.

Why cost per mile striped is a good measure

Cost per mile striped is a good productivity measure because it shows what was completed and what it costs. This data is used by the striping unit to adjust standard practices and make operational improvements.

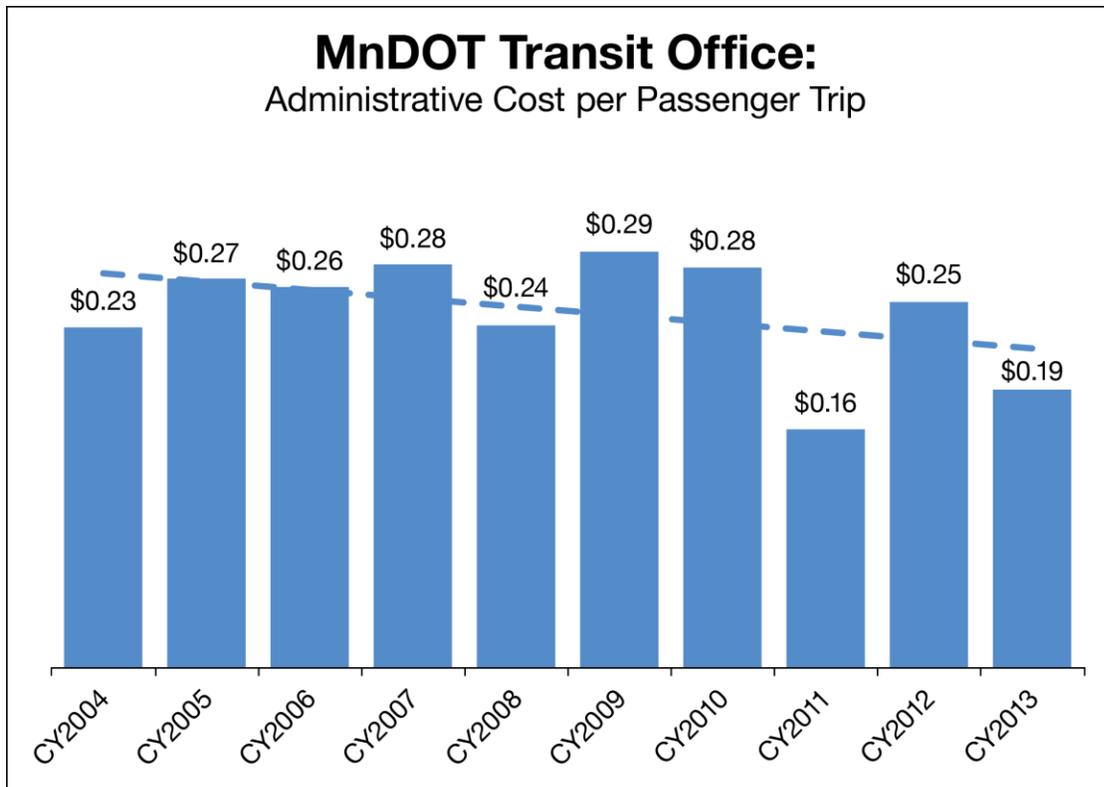
Major influencing factors

Equipment, labor and material costs, along with organization, management, supervision, weather, planning, and coordination all influence this measure. The materials used also vary greatly, ranging from less costly and less durable markings such as latex, to the midrange product epoxy, to polymer pre-formed tape, which has a long service life and is used for markings that will be exposed to high levels of roadway traffic.

Transit: MnDOT administrative cost per transit passenger trip

Transit connects people to jobs, family, schools, shopping, health care centers, sports, and cultural events. These systems also enhance the mobility of the elderly and persons with disabilities in communities across the state. Transit can be an alternative to driving that can reduce congestion, fuel consumption and greenhouse gas emissions.

Greater Minnesota's 53 public transit systems are operated by local governments and non-profits. MnDOT supports these systems through planning, research, technical assistance, and the management of state and federal transit programs that administer capital and operational funding. MnDOT's office of transit also supports transportation for seniors and individuals with disabilities statewide, contributes a share to Northstar Commuter Rail, and administers federal dollars for transit in the rural parts of the seven-county metro area.



Costs were adjusted using a 2 percent annual inflation factor based on historic MnDOT labor inflation.

The graph above shows MnDOT's Office of Transit's administrative cost per transit passenger trip. These activities include providing grant contracts and oversight of transit fund recipients. (MnDOT does not directly provide transit trips.) The downward slope of the dotted line indicates the cost per trip is decreasing over time. The unusually low administrative costs for 2011 are partially due to the state government shut down.

The recession that began in late CY2008 caused a drop in public transit ridership in CY2009 and CY2010. Fewer people going to work generally means fewer people riding transit. However, two

new FTA programs were launched in CY2008: the Job Access/Reverse Commute and New Freedoms programs. Trips generated between those two programs outnumbered the public transit trips lost due to the recession and kept the number of passenger trips trending upward. As the effects of the recession subsided in CY2011, transit ridership continued to increase.

Administrative costs were unusually high during CY2009 and CY2010 while MnDOT administered American Recovery and Reinvestment Act projects. These were nearly all capital projects, such as replacement buses, which did not result in additional service that could produce trips. Therefore, the cost per trip productivity measure exhibited poor results in those years.

Inflation-adjusted MnDOT administrative cost per transit passenger trip

Calendar Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Expenses (\$1,000)	\$2,136	\$2,528	\$2,578	\$2,883	\$2,636	\$3,173	\$3,065	\$1,891	\$2,917	\$2,639
Greater MN Ridership (1,000's)	9,091	9,450	9,827	10,382	11,188	11,059	11,115	11,495	11,576	13,752
Cost per Ride	\$0.23	\$0.27	\$0.26	\$0.28	\$0.24	\$0.29	\$0.28	\$0.16	\$0.25	\$0.19

Costs were adjusted using a 2 percent annual inflation factor based on historic MnDOT labor inflation.

Actual (unadjusted) MnDOT administrative cost per transit passenger trip

Calendar Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Expenses (\$1,000)	\$1,752	\$2,116	\$2,200	\$2,510	\$2,340	\$2,874	\$2,832	\$1,782	\$2,804	\$2,587
Greater MN Ridership (1,000's)	9,091	9,450	9,827	10,382	11,188	11,059	11,115	11,495	11,576	13,752
Cost per Ride	\$0.19	\$0.22	\$0.22	\$0.24	\$0.21	\$0.26	\$0.25	\$0.16	\$0.24	\$0.19

Costs were not adjusted for inflation.

Why administrative cost per trip is a good measure

Transit passenger trips are the most commonly used measure to gauge transit use. In Minnesota, it is used on the Governor's dashboard to measure transit performance in Greater Minnesota and in the Twin Cities metropolitan area by the Metropolitan Council.

The cost for MnDOT to administer the programs that support transit trips is the other component of this measure of productivity. The ratio of MnDOT's transit administrative costs to transit passenger trips describes the efficiency of MnDOT's processes in delivering transit. In short, the

administrative cost per transit passenger trip productivity measure describes the cost that MnDOT's activities add to each trip.

Major influencing factors

Factors that cause fluctuations in MnDOT's administrative cost per passenger trip include regulatory changes or introduction of new grant programs necessitating educational outreach and more intensive oversight, increases and decreases in available funding, and the state government shutdown. As part of its "Transit for Our Future" initiative, MnDOT's Transit office is working to increase cooperation with local providers in order to improve service for the traveling public and to build transit providers' administrative capacity to comply with state and federal rules with minimal assistance from MnDOT Transit staff.

Appendix A: Products and services framework summary

Program	
Budget Activity	Product and Service
Multimodal Systems	
Aeronautics	Airports Aviation Safety Operations and Regulation
Freight	Commercial Truck and Bus Safety Freight Rail Improvements Freight System Planning Port Improvements Rail Crossing Safety
Passenger Rail	Intercity Passenger Rail Improvement
Transit	Bicycle and Pedestrian Planning and Grants Light and Commuter Rail Transit Planning and Grants
State Roads	
Trunk Highway Program Planning and Delivery	Develop Highway Improvement Projects Highway Construction Management Oversight Plan Highway System Research and Development
Trunk Highway State Road Construction	Other Trunk Highway System Improvements Trunk Highway System Expansion Trunk Highway System Preservation
Trunk Highway Debt Service	Trunk Highway Debt Service
Trunk Highway Operations and Maintenance	Bridges and Structures Inspection and Maintenance Roadside and Auxiliary Infrastructure Snow and Ice System Roadway Structures Maintenance Traffic Devices Operation and Maintenance
Statewide Radio Communications	Radio Towers and Communications
Local Roads	
County State Aid Roads	County State Aid Highway
Municipal State Aid Roads	Municipal State Aid Highway

Note: External Partner Support can be used by any office and any budget activity.

Products and services descriptions

Aeronautics

Airports: Funding and administering airport grants, assisting local units of government, and installing and operating navigational aids.

Aviation Safety Operations and Regulation: Protecting aviation users, promoting aeronautics safety and developing aviation policies and regulations in Minnesota.

Freight

Commercial Truck and Bus Safety: Issuing appropriate registrations, certificates, and permits; conducting audits, reviews and safety inspections; and providing information, education and technical assistance related to commercial motor carriers.

Freight Rail Improvements: Funding provided to regional railroad authorities, railroads and shippers to improve rail facilities through the Minnesota Rail Service Improvement program. Includes developing related agreements and administering related grants and loans from other funding sources.

Freight System Planning: Developing plans and information to support an integrated system of freight transportation in Minnesota, including statewide plans related to freight, rail and ports and waterways.

Port Improvements: Funding provided to public port authorities through the Port Development Assistance Program. Includes developing related agreements and administering related grants and loans.

Rail Crossing Safety: Identifying and developing safety improvements at railroad grade crossings. Coordinating rail crossing safety and rail regulatory activities. Monitoring functions of railroad track and structures.

Passenger Rail

Intercity Passenger Rail Improvement: Activities and grants related to high speed and intercity rail. Includes system planning; project scoping; environmental documents; public hearings; preliminary engineering; final design; rolling stock procurement; acquisitions (including right of way); construction; field inspections; negotiating with the railroads; developing financial, project management and operating plans; value engineering; entering into cost sharing agreements with other public and private entities; carrying out the provisions of the High Speed Rail Compact on behalf of the state; and other technical activities.

Transit

Light and Commuter Rail: All work and grants related to light rail transit, including planning, project scoping, environmental documents, public hearings, preliminary engineering, value engineering, final design, acquisitions (including right of way), construction, field inspection, and other technical activities.

Bicycle and Pedestrian Planning and Grants: Developing and implementing the Statewide Bicycle System Plan, Pedestrian System Plan, State Bikeway Route development,

State Bicycle Map, bicycle and pedestrian design guidance and program administration. Administering Safe Routes to School grant programs and managing the ABC Ramps.

Transit Planning and Grants: Developing and implementing the Greater Minnesota Transit Investment Plan and other planning activities. Programming and administering grants funded by the Federal Transit Administration and state appropriations.

Trunk Highway Program Planning & Delivery

Highway Construction Management Oversight: Managing or monitoring the overall progress of a state highway project through completion of construction and final project documentation. Includes early project coordination to address project specific or procurement method requirements and constraints. Work primarily includes field inspections, oversight, quality management, testing, project scheduling, and monitoring for compliance with the schedule and specifications. Work also involves managing and advising appropriate implementation of State Road Construction and federal funding allocations including fiscal management, financial tracking and regulatory conformity.

Develop Highway Improvement Projects: Managing or monitoring the overall progress of a state highway project from project initiation through completion of the project delivery package for procurement and letting. Includes ongoing project coordination as needed to address project specifics and procurement method requirements and constraints; activity coordination to ensure delivery of projects using appropriate scheduling and monitoring tools to ensure efficient delivery on time and within budget; managing and advising appropriate implementation of State Road Construction and federal funding allocations including fiscal management, financial tracking and regulatory conformity. Encompasses all direct and supporting activities necessary for preparing the contract documents and supporting documentation for construction contract procurement and as needed to support the procurement process. The time frame usually begins once a project is identified and ends prior to letting, but can extend into the construction time frame.

Research and Development: Administering and monitoring MnDOT's research program. Guiding policy decisions by developing, refining and testing methods for best practices and by using appropriate economic, demographic and labor market analysis. Providing strategic direction and establishing outcomes and performance measures for MnDOT's research program. Fostering the exchange of technical information and providing access to results of external and internal research.

Plan Highway System: Managing and integrating current data and best practices for multi-modal policy formation and investment packaging. Coordinating transportation system plans and policies with other government entities. Preparing updates of the statewide plan. Applying long-range statewide transportation policies and performance measures at the district level to guide district transportation project/investment decisions both within the district and in regional and inter-regional corridors which may cross district lines. Using mobility performance targets to monitor corridor performance, identify problem areas, and assess where additional management and/or investments are needed to improve under-performing areas. Includes Central Office technical assistance to districts and local partners.

Trunk Highway State Road Construction

Trunk Highway System Expansion: Hard construction dollars used for expansion on roads and bridges shoulder to shoulder.

Other Trunk Highway System Improvements: Hard construction dollars used for stand-alone projects outside of the highway shoulder, including intelligent transportation systems.

Trunk Highway System Preservation: Hard construction dollars used for preservation of roads and bridges shoulder to shoulder.

Trunk Highway Debt Service

Trunk Highway Debt Service: Repayment of bond debt.

Trunk Highway Operations and Maintenance

Bridges and Structures Inspection and Maintenance: Inspecting, maintaining and operating bridges and structures (bridges, box culverts and overhead sign structures). Conducting bridge inspections, providing inspection training, monitoring and certification; maintaining and repairing bridges; inspecting, maintaining and repairing non-bridge structures such as earth retaining systems (retaining walls), noise walls, tower lighting, roadway lighting, and traffic signal systems.

Roadside and Auxiliary Infrastructure: Maintaining rest areas, fixed scale sites, roadside erosion, vegetation, mowing, and regulatory functions such as land management permits, encroachments, noxious weed control, MS4, etc.

Snow and Ice: All work related to keeping the roads clear of snow and ice. Major activities include winter stockpiling, setup and transfer of de-icing materials, plowing and sanding, preparing, inspecting and cleaning equipment, installing snow fences, and post storm cleanup.

Traffic Devices Operation and Maintenance: Inspecting maintaining, operating and managing the highway traffic safety system through signal timing, freeway management/operations, speed zoning, signals, signing, lighting, guardrail, cable median barrier, crash attenuators, pavement markings, traffic management systems (i.e. ramp meters, cameras), and other activities and devices.

System Roadway Structures Maintenance: Inspecting, maintaining and operating the state highway system roadway structures, including pavement, shoulders and drainage.

Statewide Radio Communications

Radio Towers and Communications: Making major wireless or electronic systems upgrades or improvements; providing a shared public safety radio system among state agencies; deploying electronic and wireless communications systems at regional Transportation Operations Communications Centers, maintaining wireless two-way radio communications systems, towers, and electronic equipment.

County State Aid Roads

County State Aid Highway: Distributing and administering construction and maintenance funds to counties for eligible roads and bridges.

Municipal State Aid Roads

Municipal State Aid Highway: Distributing and administering construction and maintenance funds to cities with a population greater than 5,000 for eligible roads and bridges.

External Partner Support (can occur in any of the products and services): Used for dedicated appropriations, including agreements and partnerships. Services for outside partners, for example cities; counties; other agencies, states, or countries; or other governmental entities. Can be associated to any program or budget activity.

Appendix B: Glossary of Terms

The glossary of terms provides definitions of specific terms used in this report.

Area Transportation Partnership: An ATP is a group of traditional and non-traditional transportation partners including representatives from MnDOT, Metropolitan Planning Organizations, Regional Development Commissions, counties, cities, tribal governments, special interests, and the public that have the responsibility of developing a regional transportation improvement program for their area of the state.

The ATP process was introduced in the early 1990s to ensure stakeholder participation in the investment of federal transportation funding. The ATP process provides for early and continuous involvement in the development of the State Transportation Improvement Plan a four year list of projects that are expected to be done within that timeframe.

Construction cost index: The Minnesota construction cost index is an indicator of price trends for highway construction. It is composed of six indicator items: roadway excavation, to indicate the price trends for all roadway excavation; concrete pavement and plant-mixed bituminous, to indicate the price trend for all surfacing types; and reinforcing steel, structural steel, and structural concrete, to indicate the price trend for structures.

Cost - Indirect: Indirect costs are those costs that cannot be directly tied to a specific output, e.g. depreciation, routine building maintenance, and other administrative and support costs. Indirect costs are frequently referred to as “the cost to keep the lights on.”

Cost - Direct: Direct costs occur when expenditures are tied directly to a project number that can be tracked to a customer deliverable. That is, dollars which buy products and/or services delivered directly to the traveling public.

District Risk Management Program: Focuses funding on all non-NHS highway needs on all state highways. The majority of the program supports pavement and bridge rehabilitation or replacement projects. The DRMP project selection process is structured to give districts the flexibility to address their greatest regional and local risks. Districts are also able to make additional investments on the NHS system if the proposed project is in response to a high risk issue.

Effectiveness: Performance measure focused on achieving the end goal and takes into consideration any variables that may change in the future. Effectiveness encourages innovation as it demands innovation to meet desired goal(s).

Efficiency: Efficiency is often confused with effectiveness as the output to input ratio and focuses on getting the maximum output with minimum resources and still meet effectiveness measures. Efficiency focuses on doing things right and demands documentation and repetition.

Job full cost: Actual transaction amounts plus applied overhead cost rates established by MnDOT based on the previous year’s activity.

Inflation factor: For unit cost growth across all operations and maintenance activities, MnDOT is using a 3 percent inflation factor based on historical data. It incorporates labor compensation rates as well as pricing for major commodity materials and services, such as fuel, asphalt, utilities, and salt.

A 2 percent inflation factor is used when the bulk of the costs are labor, based on historical MnDOT labor costs.

Metropolitan Planning Organization: A metropolitan planning organization is a federally mandated and federally funded transportation policy-making organization in the United States that is made up of representatives from local government and governmental transportation authorities. ([Wikipedia definition of Metropolitan Planning Organization](#))

Minnesota GO: The Minnesota Department of Transportation launched the Minnesota GO visioning process to better align the transportation system with what Minnesotans expect for their quality of life, economy and natural environment.

The effort is based on an understanding that transportation is a means to other ends, not an end in itself. It also recognizes that infrastructure is only one of many elements necessary to achieving a high quality of life, a competitive economy and a healthy environment.

This 50-year vision for transportation will require consistency and collaboration across jurisdictions and sectors to be fully achieved. Although MnDOT initiated the effort to develop the vision, this is a vision for all forms of transportation, and ownership of the vision is a shared responsibility. Minnesota’s multimodal transportation system maximizes the health of people, the environment and our economy. The system:

- Connects Minnesota’s primary assets—the people, natural resources and businesses within the state—to each other and to markets and resources outside the state and country
- Provides safe, convenient, efficient and effective movement of people and goods
- Is flexible and nimble enough to adapt to changes in society, technology, the environment and the economy

Quality of Life	Environmental Health	Economic Competitiveness
Recognizes and respects the importance, significance and context of place – not just as destinations, but also where people live, work, learn, play, and access services Is accessible regardless of socio-economic status or individual ability.	Is designed in such a way that it enhances the community around it and is compatible with natural systems. Minimizes resource use and pollution.	Enhances and supports Minnesota’s role in a globally competitive economy as well as the international significance and connections of Minnesota’s trade centers Attracts human and financial capital to the state.

Minnesota State Highway Investment Plan: The 20-Year Minnesota State Highway Investment Plan 2014-2033 supports the guiding principles from the Minnesota GO vision and links the policies and strategies laid out in the [Statewide Multimodal Transportation Plan](#) to improvements on the [state highway system](#).

National Highway System: The National Highway System consists of roadways important to the nation's economy, defense, and mobility, and was developed by the Department of Transportation in cooperation with the states, local officials, and metropolitan planning organizations. The NHS includes the following subsystems of roadways (a specific highway route may be on more than one subsystem):

Interstate - The Eisenhower Interstate System of highways retains its separate identity within the NHS.

Other Principal Arterials - These are highways in rural and urban areas which provide access between an arterial and a major port, airport, public transportation facility, or other intermodal transportation facility.

Strategic Highway Network - This is a network of highways which are important to the United States' strategic defense policy and which provide defense access, continuity and emergency capabilities for defense purposes.

Major Strategic Highway Network Connectors - These are highways that provide access between major military installations and highways that are part of the Strategic Highway Network.

Intermodal Connectors - These highways provide access between major intermodal facilities and the other four subsystems making up the National Highway System

Performance measures: Quantifiable indicators used to assess how well, or how effectively, an organization is achieving its desired objectives. Much of the time results are compared against established targets to determine if improvement is needed.

Productivity: Performance measure focused on getting the maximum output with minimum resources while still meeting effectiveness targets. Efficiency focuses on doing things right and demands documentation and repetition.

Regional Community Improvement Priority: Regional Community Improvement Priorities are investments that respond to regional concerns and collaboration opportunities, beyond system performance needs, in order to support economic competitiveness and quality of life in Minnesota. While these investments may improve highway performance, they do not constitute an improvement necessary to meet MnDOT's system-wide performance targets.

Statewide Multimodal Transportation Plan: As the Statewide Multimodal Transportation Plan, this document is reflective of Minnesotans' voices, as expressed throughout this intensive engagement and review process. The content is strategically organized into chapters that address the most pertinent questions facing Minnesota's transportation system. The result is a transportation policy framework for all Minnesota partners and transportation modes for the next 20 years that focuses on multimodal solutions that ensure a high return-on-investment while considering the context of place, and how land use and transportation systems should be better integrated.

State Transportation Improvement Plan: The State Transportation Improvement Program is Minnesota's four year transportation improvement program. The STIP identifies the schedule and funding of transportation projects by state fiscal year (July 1 through June 30). It includes all state and local transportation projects with federal highway and/or federal transit funding along with 100 percent state funded transportation projects. Rail, port and aeronautic projects are included for information purposes. The STIP is developed/updated on an annual basis.

Statewide Performance Program: The statewide planning process establishes a cooperative, continuous and comprehensive framework for making transportation investment decisions throughout the state and oversight of the process is a joint responsibility of the Federal Highway Administration and the Federal Transit Administration.

Performance-Based Planning

- The statewide planning process will establish and use a performance-based approach to transportation decision making to support the national goals (MAP-21 Pub. L. 112-141, 23 USC §150) (see: National Goals & Performance Management Measures fact sheet).
- Each state will establish performance targets that address the performance measures, where applicable, to use in tracking progress toward attainment of critical outcomes for the state.
- The state will select performance targets in coordination with the relevant Metropolitan Planning Organizations to ensure consistency, to the maximum extent practicable.
- In urbanized areas not represented by an MPO, the state will select performance targets in coordination with the providers of public transportation, to the maximum extent practicable, to ensure consistency with sections 5326(c) and 5329(d) of title 49.
- States will integrate into the statewide transportation planning process other performance-based plans and processes

Trend analysis: The practice of collecting information and developing a pattern or trend in the information. In project management, trend analysis technique uses historical results to predict future outcome.

Appendix C: Major Highway Project Summaries

