

PAVEMENT CONDITION

MnDOT estimates \$30-33 billion in available funding for the state highway system over the next 20 years. A minimum of \$23.5 billion is needed to manage highest risks and meet legal requirements. This folio provides information on potential Pavement Condition investment strategies, funding levels, and outcomes for the estimated \$7-9 billion of remaining investment.

1 | WHAT IS PAVEMENT CONDITION?

One of MnDOT's largest assets is its pavements. Pavements are a critical part of MnDOT's transportation network, providing mobility and access to a wide range of users. MnDOT maintains over 11,703 miles of state highways that serve vehicles, freight, transit, bicycle users, and pedestrians. The state system consists of Interstates (e.g. I-94, I-35), non-Interstate National Highway System (NHS) routes (e.g. US 169, MN 371), and non-NHS routes (e.g. MN 13, US 59). On an average day, there are over 90 million vehicle miles traveled on Minnesota highways.

GOAL AND OBJECTIVES OF INVESTMENT

With Pavement Condition investment, MnDOT works to preserve the structural integrity of pavements to provide a safe and reliable driving surface for passenger vehicles, freight, transit, and non-motorized users. To reach this goal, MnDOT works to:

- Maintain pavements in good condition and minimize the share in poor condition
- Use cost effective treatments for replacement, rehabilitation, repair, and preventive maintenance
- Apply a mix of short-, medium-, and long-term fixes at the right time to maximize the life of the pavement

TYPES OF IMPROVEMENTS

Generally speaking, roads are fully reconstructed about every 50 years. MnDOT completes various types of pavement treatments including resurfacings and preventive maintenance between reconstructions. These treatments over the life of a roadway reduce long-term costs and prolong pavement life before a reconstruction is needed. Preventive maintenance activities help to slow pavements from deteriorating from good to fair condition. Resurfacing projects are needed approximately every 15-20 years for asphalt pavements and 25-30 years for concrete pavements.

HOW DOES MNDOT CURRENTLY SELECT PAVEMENT CONDITION IMPROVEMENTS?

Potential pavement projects are identified by the Highway Pavement Management Application (HPMA) and by MnDOT District staff. MnDOT initially scores highway segments based on the projected pavement condition forecasted by the HPMA. Pavement needs on the Interstates and other NHS routes are scored and selected separately from pavement needs off the system. Pavement projects are scored and selected within each district when selecting projects to include in the 10-year Capital Highway Investment Plan. During this process, non-pavement work may be added to a pavement project or a pavement project may be combined with a nearby bridge project.





2 | WHY IS INVESTING IN PAVEMENT CONDITION IMPORTANT?

Investment in Pavement Condition supports the state transportation goal to provide for and prioritize funding of transportation investments that ensures that the state’s transportation infrastructure is maintained in a state of good repair. Pavement deterioration is a serious risk that MnDOT is facing.

The majority of Minnesota’s highways were originally constructed between 60 and 70 years ago. Pavements generally need to be fully reconstructed every 50 years. Additional investment is needed to continue to maintain the current condition of pavements. MnDOT also needs to make minor repairs on regular intervals to prolong pavement life and reduce total life-cycle costs. MnDOT is better able to fulfill its responsibilities as stewards of the highway system by making the proper fix at the proper time.

HOW DOES PAVEMENT CONDITION SUPPORT EQUITABLE OUTCOMES?

Pavement Condition investment provides an opportunity to improve roadway condition and design especially through reconstruction projects. Many existing roadways were under designed and did not provide amenities and infrastructure to all users and the surrounding community especially in rural communities and through tribal nations.

HOW DOES MNDOT MEASURE PERFORMANCE, CONDITION, OR OUTCOMES?

Each year, MnDOT travels the state highway system with a special van that evaluates the degree of cracking and the smoothness of the ride to determine the Ride Quality Index (RQI) rating for each section of roadway. MnDOT strives to minimize the number of miles in poor condition while maximizing the number of miles in good condition. The condition of pavements is tracked annually and future pavement preservation needs are forecasted.

MnDOT’s targets for pavements are as follows:

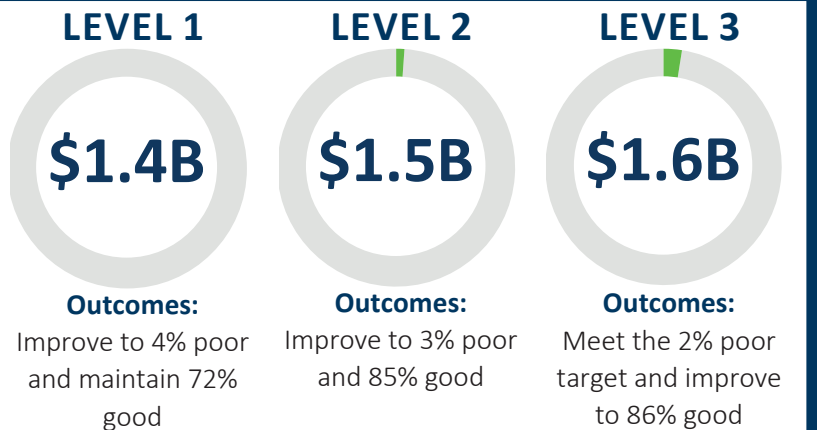
INTERSTATE	REMAINING NHS	NON-NHS
Good: 70% or greater	Good: 65% or greater	Good: 60% or greater
Poor: 2% or fewer	Poor: 4% or fewer	Poor: 8% or fewer (recommended change from 10% poor)

For reference, Interstate pavements current conditions are 0.5% poor and 91% good. Remaining NHS are approximately in 0.6% poor and in 82% good. Remaining NHS are approximately in 2.4% poor and in 75% good. Pavements are in the best condition in recent history.

3 | OPTIONS FOR INVESTING OVER THE NEXT 20 YEARS

Interstate System

The **minimum level** MnDOT would invest in Interstate pavements is **\$1.4 billion**. This is to prevent MnDOT from passing the threshold of **5% poor** as required by federal legislation while maintaining **82% in good**. Each increasing level of investment would move pavement condition closer to reaching the Interstate target of 2% poor. All levels of investment would keep Interstate pavements meeting the good target of 70% good.





4 | PAVEMENT CONDITION RISKS

WHAT ARE THE RISKS OF UNDERINVESTING?

As a part of developing performance levels for various programs and strategies, MnDOT also identified the risk of underinvesting. Six risks were rated as low to high risks based on investment at the minimum investment level for Pavement Condition. The risks and their impacts are identified below.

HIGH RISKS

Risk: Increase in poor pavement condition requiring more maintenance projects

Impact: Could result in more frequent work zones and an

increased crash exposure for roadway workers and the traveling public

Risk: Increase costs to users from poor pavement quality

Impact: Could impact vehicle fuel efficiency, increase travel times, greater wear and tear on vehicles, damage to freight cargo, and increase freight costs from detours around load posted roadways

Risk: Maintenance budgets require more reactive repairs due to lack of capital investment

Impact: Could divert operations and maintenance budgets from other activities to keep roadway pavements safe and drivable

MEDIUM RISKS

Risk: Inability to meet federal legislative requirements/ performance thresholds

Impact: Could increase financial reporting requirements, impact state bond rating and result in federal sanctions which decreases our spending flexibility

Risk: Inability to invest in more long-term pavement projects at the right time

Impact: Could require more frequent use of shorter-term fixes adding less service life to the system, requiring additional pavement investment over its life-cycle, and adding to long-term costs

Risk: Not meeting public expectations for roadway conditions

Impact: Could decrease public trust and lead to reprioritization of pavement program and projects

WHAT LEVELS OF INVESTMENT REDUCE THE LIKELIHOOD OF THE RISK OCCURRING OVER THE NEXT 20 YEARS?

The table to the right provides a summary of how risk levels changed with increased investment in Pavement Condition.

RISK STATEMENT	SHIFTS FROM HIGH TO MEDIUM RISK	SHIFTS FROM MEDIUM TO LOW RISK
Increase in poor pavement condition requiring more maintenance projects	Investment Level 3	N/A
Increase costs to users from poor pavement quality	Investment Level 2	Investment Level 4
Maintenance budgets require more reactive repairs due to lack of capital investment	Investment Level 3	N/A
Inability to meet federal legislative requirements/ performance thresholds	N/A	Investment Level 1
Inability to invest in more long-term pavement projects at the right time	N/A	Investment Level 4
Not meeting public expectations for roadway conditions	N/A	Investment Level 4



To find out more details about Pavement Condition planning and projects, go to:

Project Selection: www.dot.state.mn.us/projectselection/

Transportation Asset Management Plan: www.dot.state.mn.us/assetmanagement/tamp.html

Pavement Management: www.dot.state.mn.us/materials/pvmtgmt.html

For more information, contact:

Brad Utecht, AICP

Project Manager, 20-year State Highway Investment Plan

Minnesota Department of Transportation

395 John Ireland Boulevard, MS 440

St. Paul, MN 55155-1899

651.366.4835

bradley.utecht@state.mn.us