Chapter 7

PERFORMANCE GAPS
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PERFORMANCE GAPS

Overview

Asset condition is a critically important component of the highway system’s overall performance. Assets that are maintained in a state of good repair support safe and efficient travel and are less costly to operate over an entire life-cycle. MnDOT continuously monitors and reports asset condition using the business practices and performance measures described in Chapter 3. This information serves as the basis for MnDOT’s preservation driven investment programs and maintenance activities. For pavements and bridges, asset condition is also used to identify performance gaps, defined here as the difference between existing and desired performance.

This chapter presents 2012 condition results alongside target recommendations for state highway pavements, bridges, highway culverts, deep stormwater tunnels, overhead sign structures, and high-mast light tower structures. These target recommendations provide points of reference for evaluating condition and the adequacy of MnDOT’s planned investment. New targets for highway culverts, deep stormwater tunnels, overhead sign structures, and high-mast light tower structures also have the potential to elevate the importance of these asset categories and provide a basis for developing and evaluating investment strategy alternatives.

STATUS OF TARGETS APPEARING IN THE TAMP

TAMP target recommendations reflect the expert judgment of MnDOT staff and were identified having considered a combination of current policy and investment direction (e.g. MnSHIP), federal and state requirements (e.g. MAP-21, GASB 34), risk, expected or anticipated deterioration, principles of life-cycle costs, and public expectation (as solicited through past planning efforts).

Chapter 2 further described the MnSHIP development process looking at tradeoffs between investment levels, performance levels, and risks to evaluate and select investment priorities. Chapter 3 described the process outcomes and how they were used to help identify targets and outcomes for pavement and bridge condition.
For non-pavement and non-bridge assets, Work Groups developed asset-specific target methodologies, having considered existing and anticipated future conditions, current information on capital and maintenance investments, anticipated deterioration, and risk. For example, the Hydraulic Work Group identified the number of culverts in Poor and Very Poor condition, determined how many of them deteriorate to a worse condition annually, made judgments on the length of time that a culvert should remain in Poor or Very Poor condition given risk, and determined how many culverts could feasibly be repaired annually. The Technical Guide includes several tables that illustrate how these data were used to calculate targets. A similar methodological approach was followed for recommending targets for overhead sign structures.

Specific targets may be approved, modified or rejected through MnDOT’s public planning process and senior leadership review. Approved or modified targets for the asset categories covered below will be used to calculate investment need and guide resource allocation decisions in the next iteration of MnSHIP. These targets will also be used to further develop and refine MnDOT’s asset management strategies.

Target Recommendations

As discussed previously, the TAMP uses the terms target and plan outcomes to differentiate between desired outcomes and the outcomes MnDOT plans to achieve within the constraints of available resources. A single number can represent both ideas if MnDOT plans to achieve its desired outcome. In situations where a target and a plan outcome diverge due to insufficient resources, MnDOT uses the target to communicate need, while managing its program and maintenance activities to the plan outcome. This terminology eliminates the need for aspirational and constrained targets, as described in MnSHIP. For further detail on these terms, please see Chapter 3.

RECOMMENDED PAVEMENT TARGETS

Figure 7-1 presents MnDOT's existing pavement condition targets, plan outcomes (as reported in MnSHIP), and the new targets recommended in this TAMP.

This TAMP recommends that MnDOT recognize its plan outcomes on the Interstate and non-Interstate NHS as targets for the purpose of defining its desired outcomes and calculating investment needs. While slightly less aggressive than the target used to calculate need in MnSHIP, maintaining Poor pavement condition on no more than two percent of the Interstate System and four percent of the non-Interstate NHS represents a performance standard that is consistent with traveler expectations and MnDOT’s strategic goals and objectives.
Off the NHS, this TAMP recommends MnDOT adopt a pavement condition target of no more than ten percent Poor. This target, which is a slightly higher than existing conditions, is less aggressive than the no more than three percent Poor target MnDOT has historically used to calculate needed investment in non-NHS pavement. Adopting a less aggressive pavement condition target on the non-NHS reflects emerging federal and state policy directing MnDOT to focus its resources on priority networks (e.g. NHS). Outreach conducted as part of MnSHIP also found that a majority of MnDOT’s external stakeholders are willing to trade pavement condition on low volume roads for continued investment in other performance areas, such as safety, mobility and non-motorized transportation.

Unlike this TAMP’s target recommendations for Interstate and non-Interstate NHS pavement condition, a no more than 10 percent Poor target on the non-NHS is not likely to be met under existing revenue projections. MnDOT expects the share of non-NHS roadway miles with Poor pavement condition to increase from 7.5 percent in 2012 to 12 percent in 2023 – a difference of 303 miles. While consistent with MnSHIP investment priorities, this outcome poses significant user costs, risks damage to MnDOT’s reputation, and limits the agency’s opportunities to manage assets in a cost-effective manner. Adopting this target on the non-NHS supports strategic prioritization while still conveying the idea that there is a gap between MnDOT’s desired and planned outcome in this performance area.

This TAMP recommends retiring MnDOT’s pavement condition target of 5-9 percent across all state highways. A single statewide pavement condition result is a useful summary reporting tool, but the 5-9 percent target is made redundant by MnDOT’s measures of pavement condition on Interstates, the non-Interstate NHS and the non-NHS. These sub-system measures provide a better, more accurate indication of performance because they track more closely with how MnDOT manages and invests in its assets.

Figure 7-1: Existing and Recommended Pavement Condition Targets

<table>
<thead>
<tr>
<th>System</th>
<th>2012 Condition (% Poor)</th>
<th>Aspirational Target (% Poor)</th>
<th>Constrained Target/10-year Anticipated Outcome (% Poor)</th>
<th>Target Recommendation (% Poor)</th>
<th>Plan Outcome (% Poor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate</td>
<td>2.4 %</td>
<td>≤ 2%</td>
<td>2 %</td>
<td>≤ 2 %</td>
<td>2 %</td>
</tr>
<tr>
<td>Non-Interstate NHS</td>
<td>4.3 %</td>
<td>≤ 4%</td>
<td>4 %</td>
<td>≤ 4 %</td>
<td>4 %</td>
</tr>
<tr>
<td>Non-NHS</td>
<td>7.5 %</td>
<td>NA</td>
<td>12 %</td>
<td>≤ 10 %</td>
<td>12 %</td>
</tr>
</tbody>
</table>
RECOMMENDED BRIDGE TARGETS

As identified in Figure 7-2, the TAMP recommends no changes to MnDOT’s bridge condition targets. Consistent with MnSHIP investment priorities, MnDOT expects to meet condition targets for both NHS and non-NHS bridges. Compared to current condition, MnDOT expects the share of NHS deck area on Poor condition bridges to drop slightly from 4.7 percent in 2012 to 2 percent in 2023. The share of non-NHS deck area on Poor condition bridges is expected to increase from 2.1 percent to 6 percent, but this remains below MnDOT’s target of 8 percent.

Figure 7-2: Existing and Recommended Bridge Condition Targets

<table>
<thead>
<tr>
<th>System</th>
<th>2012 Condition (% Poor)</th>
<th>MNSHIP</th>
<th>TAMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS</td>
<td>4.7 %</td>
<td>≤ 2%</td>
<td>≤ 2 %</td>
</tr>
<tr>
<td>Non-NHS</td>
<td>2.1 %</td>
<td>≤ 8%</td>
<td>≤ 8 %</td>
</tr>
</tbody>
</table>

RECOMMENDED HIGHWAY CULVERT AND DEEP STORMWATER TUNNEL TARGETS

Figure 7-3 presents the current condition of MnDOT’s highway culverts and deep stormwater tunnels. Performance targets for the condition of these assets were not available during the development of MnSHIP. This TAMP, reflecting the expert judgment of the Hydraulics Work Group, recommends that MnDOT establish targets that no more than eight percent of highway culverts be in Poor condition and no more than three percent be in Very Poor condition. These targets represent a slight improvement over 2012 condition levels. For deep stormwater tunnels, this TAMP recommends that MnDOT establish targets in line with those for highway culverts. This target represents a substantial improvement over current condition; however, a plan is in place to systematically address deep stormwater tunnel needs over the next several years, including within a very large tunnel under I-35W in Minneapolis. Deep stormwater tunnel condition will improve to 23 percent Poor and 11 percent Very Poor as a result of rehabilitating the I-35W (south) tunnel.
RECOMMENDED OVERHEAD SIGN STRUCTURES AND HIGH-MAST LIGHT TOWER STRUCTURES TARGETS

Figure 7-4 presents the current condition of MnDOT’s overhead sign structures and high-mast light tower structures. Performance targets for the condition of these assets were not available during the development of MnSHIP. This TAMP, reflecting the expert judgment of the other traffic structures Work Group, recommends that MnDOT establish a target of no more than four percent of its overhead sign structures in Poor condition and no more than two percent be in Very Poor condition. MnDOT expects the share of overhead sign structures in Poor condition to decline in the future as installation specifications and protocols are put in place.

At the time of the development of this TAMP, MnDOT was in the process of redefining condition rating criteria for high-mast light tower structures and there was insufficient data to appropriately recommend a condition target. A target for this asset category will be revisited during the next update of MnSHIP.

Note: Investment need identified to meet target; commitment will be determined in MnSHIP

Figure 7-4: Recommended Existing Conditions and Recommended Overhead Sign Structures and High-Mast Light Tower Structures Condition Targets

<table>
<thead>
<tr>
<th>Asset</th>
<th>2012 Condition</th>
<th>Aspirational and Constrained Target / 10-year Anticipated Outcome</th>
<th>Target Recommendation</th>
<th>Plan Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overhead Sign Structures</td>
<td>6 % Poor; 8 % Very Poor</td>
<td>NA</td>
<td>≤ 4 % Poor; ≤ 2 % Very Poor</td>
<td>TBD</td>
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<tr>
<td>High-Mast Light Tower Structures</td>
<td>6 % Poor; 15 % Very Poor</td>
<td>NA</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

Note: Investment need identified to meet target; commitment will be determined in MnSHIP
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