Chapter 9

IMPLEMENTATION AND FUTURE DEVELOPMENTS: SUPPLEMENTAL INFORMATION

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Overview

This chapter describes a process to help MnDOT decide which assets to consider adding when it develops future TAMPs. A few asset management tools and techniques that MnDOT could potentially implement in the future are also discussed.

Process

This section describes a generic process that MnDOT can use to help identify future enhancements to the TAMP. For instance, it includes a process for identifying assets that can be added to future versions of the TAMP. It also includes information on the gap analysis technique used for evaluating current and desired practices and for identifying priorities for actions needed to achieve agency goals. Other performance metrics are also included that can be used to track the financial sustainability of MnDOT's investments.

INCORPORATING OTHER ASSETS IN THE TAMP

Figure 9-1 depicts a process for evaluating the availability and maturity of data for a given asset category, to determine whether it can or needs to be included in the TAMP.

Figure 9-1: Process Used to Collect and Summarize Asset Data

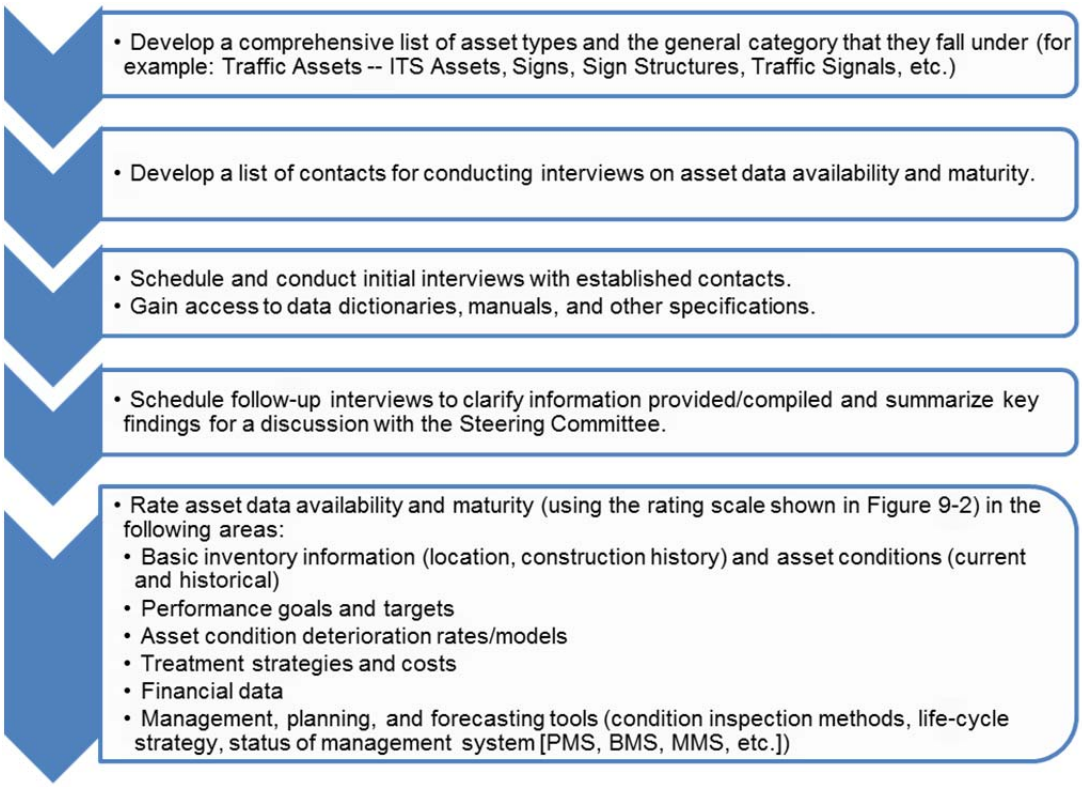

Figure 9-2: Rating Scale for Data Availability and Maturity Assessment

RATING	DESCRIPTION
1	Readily available with minimum manipulation, well-established process, data verified and high-confidence in system
2	Intermediate availability, requires moderate level of manipulation to convert data to a usable format, efforts to improve systems in place
3	Difficult to use data in current format/significant manipulations required, no management system but data tracked through spreadsheets, somewhat documented system
4	Information not readily available/very little data available, no management system in place, complete lack or very little documentation on process
5	Not available/unable to assess, No management system in place

After the data availability and maturity assessments are made, the results should be organized into a matrix (similar to the one shown in Figure 9-3) for comparing the asset categories evaluated.

Figure 9-3: Sample Data Availability and Maturity Level Assessment Summary

ASSET	RATING FOR:					
	BASIC INVENTORY AND CONDITIONS	PERFORMANCE GOALS AND, TARGETS	TREATMENT STRATEGIES AND COSTS	DETERIORATION RATES	FINANCIAL DATA	MANAGEMENT PLANNING, AND FORECASTING
Pavements	1	1	2	2	2	2
Bridges	1	3	3	5	2	4
ITS Assets	2	4	3	5	2	4
Slopes	2	3	3	5	5	5
Guard Rails, Barriers, Impact Attenuators	3	5	3	5	5	4

It should be noted that data availability and maturity cannot be the only driving factors for determination of the final list of assets that will be included in the TAMP; other factors to consider include:

- Level of investment in the assets, including either financial investments or personnel time
- Contribution to the agency's risk levels
- Reporting requirements, legislation, or mandates (e.g. MAP-21 requirements, EPA, GASB, and MnDOT internal requirements)
- Departmental strategic priorities
- Historical practices
- The need to balance transportation partner needs and requests

The final decision regarding the assets to be included should be conducted through a workshop facilitated by the Asset Management Steering Committee and involving members of the asset Work Groups and other MnDOT stakeholders.

GAP ANALYSIS

A gap analysis is a technique that provides an objective and structured process for evaluating current and desired practices and identifying priority actions needed to achieve agency goals. A gap analysis process typically includes a scoring system that allows an agency to rate a specific set of criteria (developed for a specific topic) in order to determine the maturity level for each component included in the assessment.

A recent National Cooperative Highway Research Program project (NCHRP 08-90) resulted in the development of an updated gap analysis spreadsheet tool for asset management. The tool considers MAP-21 requirements and will help state transportation departments identify actions to include in their asset management improvement plans. The gap analysis tool (a) enables an objective assessment of agency practices; (b) introduces a framework for assessing gaps in legislated requirements or core capabilities; (c) provides a tool to facilitate data analysis; and (d) simplifies the analysis and reporting of this information.

The final products from this study are expected to be available in the fall of 2014 through NCHRP[1]. Transportation agencies could potentially use the tool to identify, evaluate, and prioritize areas for improvement through a more structured and streamlined approach.

OTHER PERFORMANCE METRICS

A study published by the FHWA[2] examines a host of proposed performance measures that are centered on an *Asset Sustainability Index* (ASI). The report defines ASI as *a composite metric computed by dividing the amount budgeted on infrastructure maintenance and preservation*[3] *over time by the amount needed to achieve a specific infrastructure target*. Mathematically, it is:

$$ASI = \frac{Amount\ Budgeted}{Amount\ Needed}$$

An ASI value of 1.0 is considered an ideal scenario when all the needs are accounted for. The ASI can be used in time-series plots to analyze long-term trends, and can also be used as a combined metric to include all the assets being managed by an agency. Or, it can focus on a specific asset category or activity (e.g. pavements, bridges, maintenance) to develop a sustainability ratio metric specific to that asset/activity.

Although the ASI is a relatively simple concept, time-series ASI data can be a very informative metric for long-term (and short-term) planning purposes. An example of how Asset Sustainability Indices can be used to visualize program needs is shown in Figure 9-4.

[1] NCHRP (2014). Transportation Asset Management Gap Analysis Tool (Web Link)
[2] FHWA (2012). Asset Sustainability Index: A Proposed Measure for Long-Term Performance (Web Link)
[3] The terms "maintenance" and "preservation" are generically used to include routine, reactive, preventive, rehabilitative, and even replacement activities that contribute to the achievement of an infrastructure condition target.

Figure 9-4: Illustration of Asset Sustainability Indices (Output)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Pavements	0.83	0.82	0.81	0.81	0.80	0.79	0.78	0.77	0.77	0.76
Major Routes	0.80	0.79	0.78	0.78	0.77	0.76	0.75	0.75	0.74	0.73
Arterials	1.00	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
Collectors	1.00	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
Pavement Rehabilitation/Replacement	0.40	0.40	0.39	0.39	0.38	0.38	0.38	0.37	0.37	0.37
Pavement Preventive Mainenance	1.00	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
Bridges	0.90	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.83	0.82
Preventive Maintenance/Preservation	0.90	0.89	0.88	0.87	0.86	0.86	0.85	0.84	0.83	0.82
Sub and Superstructures	0.87	0.86	0.85	0.84	0.84	0.83	0.82	0.81	0.80	0.79
Decks	0.89	0.88	0.88	0.87	0.86	0.85	0.84	0.83	0.82	0.82
Painting	1.00	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91
Maintenance	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.89	0.88	0.87
Guardrail	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.89	0.88	0.87
Pavement Markings	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.89	0.88	0.87
Drainage	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.89	0.88	0.87
Signage	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.89	0.88	0.87
Vegetation/Roadside	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.89	0.88	0.87
Pavement Surfaces	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.89	0.88	0.87
Overall ASI	0.88	0.87	0.855	0.84	0.83	0.82	0.81	0.79	0.77	0.75

Each asset/program has its own sustainability index, which can be then be aggregated into an overall ASI for the agency. The agency can then analyze the specific asset(s)/program(s) that strongly impact the overall ASI. This can help the agency and policymakers set priorities as they make investment decisions. Such a performance metric can help track the financial sustainability of agency assets.