

Basic Transportation Asset Management Plan Outline

This outline was created using the Transportation Asset Management Plan (TAMP) Builder (www.tamplate.org), a product of NCHRP Project 8-36/116. Please visit [the site](#) for more information.

Introduction

The Introduction section of your TAMP orients your reader to the purpose, goals and contents of the document. It includes an overview of your agency's mission and goals, and a high level description of your agency's assets and their role in serving your customers, creating vital communities, and supporting the economy. You may want to include an executive summary as part of your Introduction section.

Note: State DOTs must submit an initial TAMP by April 30th, 2018 and a complete TAMP by June 30, 2019. The initial TAMP has slightly different requirements from the final TAMP, in part because it will be used by FHWA to certify the state's TAMP development processes. According to FHWA-issued TAMP process certification guidance, the initial TAMP may exclude the following sections:

- Life cycle planning analysis
- Risk management analysis
- Financial plan.

The initial plan must include the performance measures for pavement and bridge conditions, but State DOTs are not required to include their two and four-year performance management targets for bridge and pavement conditions in their initial TAMP. This one-time exclusion applies because the deadline for State DOTs to set those targets is less than 6 months before the deadlines for submission of the initial TAMP (however, FHWA encourages State DOTs to include the targets if available). In all other respects, however, the initial plan must meet TAMP requirements.

Background

The introductory section allows the reader to quickly review the purpose of your TAMP, understand the mission and goals of your agency, find a snapshot of the assets that your agency manages, and learn what can be found inside the document. The section should orient your readers so that they can easily find a particular section of the document, if that is what they are seeking. It also provides details about other relevant documents and

how they might be linked to the TAMP. Finally, the introductory section includes an overview of the process for developing the TAMP, and ongoing implementation and updating activities.

TAMP development is an iterative process, and therefore it can be challenging to present the relevant sections in final form, in a linear manner and without reference to other sections. An executive summary can be used as a strategy for providing an overview of the final findings, conclusions and recommendations for the plan. An executive summary can be included as part of the introduction, or stand alone as its own section.

What to Include

The following may be included in the Introduction section of your TAMP:

- Executive Summary (or can stand alone as own section)
- Purpose of the Transportation Asset Management Plan including answers to the following questions:

- (1) What is the current status of our assets?
- (2) What is the required condition and performance of those assets?
- (3) Are there critical risks that must be managed?
- (4) What are the best investment options available for managing the assets?
- (5) What is the best long-term funding strategy?

- Agency overview (including agency assets, state geography, demographics, governance, etc.)

- Agency mission and goals
- TAMP section overviews
- TAMP implementation and update process

Note: Because Basic's TAMP does not include a Regulatory and Legislative Requirements section, include any relevant language here (e.g. regarding MAP-21).

References

- Transportation Asset Management Plan Final Rule:
<https://www.federalregister.gov/d/2016-25117>
- Federal TAMP Requirements:
<https://www.gpo.gov/fdsys/pkg/FR-2016-10-24/pdf/2016-25117.pdf>
- Federal TAMP Guidance: <https://www.fhwa.dot.gov/asset/guidance/certification.pdf>

Inventory and Condition

The Inventory and Condition section of your TAMP provides an overview of the assets in your TAMP and a high level description of the current conditions of those assets (e.g. materials, components, age, condition rating, replacement value). All asset types and data discussed in subsequent sections will relate to the inventory included in this section. The assets will be presented by any asset classification system that your agency employs.

Background

You are required to include all pavement and bridge assets located on the NHS in your state, but you may include additional assets to allow for a more extensive management program. The asset types that you include should be reflected in the performance measures that you include in that section (e.g. any asset that will have performance data gathered should be listed in your inventory). If your agency has historic asset data, that can also be included in this section.

The level of detail at which you present your asset inventory will depend upon:

1. The data you have available;
2. The methods your agency uses to make asset maintenance decisions (e.g. do you break assets down to the component level for maintenance); and
3. The performance measures that you use to track conditions.

If your agency's asset inventory is extensive, you may consider including the full inventory in an appendix and providing only a high level summary (e.g. count by functional class and system) in this section of your TAMP.

What to Include

The following may be included in the Inventory and Condition section of your TAMP:

- A list (summary or count) of all assets for which your agency chooses to include in the TAMP (with the possibility of a full inventory included as an appendix). This must include all NHS pavement and bridges in your state, regardless of owner.
- Historic data,
- Corresponding condition and performance data for those assets (likely to be presented in tabular format, with details in an appendix).

Note: The TAMP rule requires that agencies produce an estimate of asset value for NHS pavements and bridges. If you have not included an asset valuation section in your TAMP a tabulation of asset values should be included here.

Note: As you have not included a Data Management section in your TAMP, a summary of how data on the inventory are managed should also be described here.

Note: As you have not included a Process Improvements section in your TAMP, a summary of how you agency uses data to consider adjustments to the process could be described here.

Note: As you have not included a Future Demand section in your TAMP, a description of how future growth will impact asset needs could be included here.

References

- Transportation Asset Management Plan Final Rule:
<https://www.federalregister.gov/d/2016-25117>

Objectives and Measures

The Objectives and Measures section of your TAMP provides an overview of the measures that you are using to track and manage your assets' performance. These measures will provide data relevant to asset condition and management practices, but are selected to support your agency's overall goals and objectives. This section provides highlights of the ways that asset management program activities are driving measures in the desired direction, and are working to support agency-wide goals and objectives.

Background

The objectives included in your TAMP should provide a description of what your agency intends to achieve through transportation asset management plans and processes. These may be linked to, or in some cases synonymous with, those objectives that have been established at the agency-wide level. They will all be supportive of the agency-wide purpose and mission.

You must include the performance measures for NHS pavement and bridge condition established in 23 CFR Part 490. Your agency may also include other performance measures to supplement the required measures in your TAMP. Your performance measures selected for the management of assets will:

- provide you with your baseline asset conditions;
- help you track your progress across program areas;
- predict how conditions are likely to change in the future; and
- provide a level of conditions or performance to which you are striving.

The measures should be quantifiable using the data that your DOT is currently collecting. Most (if not all) of the measures you will use for your TAMP are likely among those that your DOT is already collecting, and may be used in other program areas.

What to Include

The following may be included in the Objectives and Measures section of your TAMP:

- An overview of your agency's objectives and measures, with discussion of the elements that link directly to asset management;
- A description of the objectives of your TAM program;
- A description of the measures for your TAM program, linked to your objectives;
- Current asset baseline conditions, reported through performance measures;
- A snapshot of how the agency hopes those measures to move, for the objectives to be met; and
- A discussion of your agency's process of measuring, tracking, reporting and revising the measures (and objectives, if warranted), or a reference to the Performance Assessment section.

Note: if you have not included an Environmental Sustainability section in your TAMP, a mention of how your agency is managing that issue with respect to assets can be included here.

Note: if you have not included a Communications and Reporting section in your TAMP, a

discussion of how your agencies uses measure to communicate with stakeholders and decision makers can be included here.

References

- National Performance Management Measures; Assessing Pavement Condition for the National Highway Performance Program and Bridge Condition for the National Highway Performance Program.: <https://www.federalregister.gov/d/2017-00550>
- NCHRP Report 551 - Performance Measures and Targets for Asset Management: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_551.pdf
- NCHRP Report 666 - Target-Setting Methods and Data Management to Support Performance-Based Resource Allocation by Transportation Agencies - Volume I: Research Report, and Volume II: Guide for Target Setting and Data Management: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_666.pdf

Performance Assessment

The Performance Assessment section of your TAMP describes how your agency is doing with respect to measures, objectives and level of service goals that relate to asset management. It provides a description of where your agency stands with respect to measures, targets, and goals, what is required to meet goals and targets, and what is likely to happen given the actual budget. It also provides a description of the process by which your agency tracks performance (e.g. data collection, analysis, revision of policies or targets). It may also detail the internal strategies that the agency employs to effectively and efficiently share data among departments.

Background

State DOTs are required to establish a process for conducting a performance gap analysis. This analysis must include two and four year targets as required in 23 CFR 90, performance gaps for NHS pavements and bridges, and strategies to close or address the gaps. The analysis should also include 10 year targets, covering the time frame of the TAMP.

The final rule on TAM defines ‘performance gap’ as “the gaps between the current asset condition and state DOT targets for asset condition...”. Your performance assessment should also include the gaps between predicted asset condition and state DOT targets for asset condition.

What to Include

The following may be included in the Performance Assessment section of your TAMP:

- The reporting of relevant performance measures and current conditions, and a comparison to goals and objectives
- Gap analysis showing current condition; two, four and ten year targets; two, four, and ten year performance projections
- An explanation of how these are linked to other sections of the TAMP (e.g. Objectives & Measures, Level of Service)
- A description of how these measures fit within the overall agency measures
- A description of the ways in which the measures support decision-making and program adjustment within the agency
- Process for conducting performance gap analysis to identify deficiencies hindering progress toward improving or preserving the NHS and achieving and sustaining the desired state of good repair.

Note: if you have not included a Current Methods and Tools section in your TAMP, a summary of how what data tools your agency uses to capture and analyze data for performance monitoring should be included here.

References

- National Performance Management Measures; Assessing Pavement Condition for the National Highway Performance Program and Bridge Condition for the National Highway

Performance Program.: <https://www.federalregister.gov/d/2017-00550>

- NCHRP Report 551 - Performance Measures and Targets for Asset Management: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_551.pdf

- NCHRP Report 666 - Target-Setting Methods and Data Management to Support Performance-Based Resource Allocation by Transportation Agencies - Volume I: Research Report, and Volume II: Guide for Target Setting and Data Management:

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_666.pdf

- FHWA TPM Toolbox: <https://www.tpmtools.org>

Lifecycle Planning

The Lifecycle Planning section of your TAMP describes your agency's process for management of the lifecycle of your assets. A lifecycle plan is a strategy for managing a group of assets with the aim of maintaining a specific level of service while minimizing costs. Consideration of the lifecycle through the management of assets ensures that your agency is getting the highest and best use out of your infrastructure. This section includes a description of the process behind this management, as well as how your asset data supports and informs this policy.

Background

Lifecycle planning is completed at the asset group, or sub-group level. Each lifecycle plan will consider the following for each asset type:

- Replacement cost
- Deterioration curves (for asset or component, as appropriate)
- Desired level of service, and risk associated with loss or reduction in service
- Maintenance strategies and impact on deterioration rate
- Maintenance costs
- Sustainability and environmental considerations of maintenance, rehabilitation and replacement

What to Include

The following may be included in the Lifecycle Planning section of your TAMP:

- Lifecycle plans for each asset type, or asset sub-group
- Description of how relationship between lifecycle plans and performance measures
- Description of the implementation of lifecycle management into the agency's decision making process
- Process for the development of a financial plan
 - Estimated cost of expected future work to implement investment strategies
 - Estimated funding levels
 - Future funding sources
 - NHS pavement and bridge asset valuation and the investment necessary to maintain asset value

Note: if you have not included an Asset Valuation section in your TAMP, a description of how your agency measures the value of your assets could be included here.

References

- Using a Life Cycle Planning Process to Support Asset Management:
https://www.fhwa.dot.gov/asset/pubs/life_cycle_planning.pdf
- NCHRP Report 545 - Analytical Tools for Asset Management:
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_545.pdf
- UK Roads Liaison Group Lifecycle Planning Guidance (Chapter 9):

<http://www.ukroadsliaisongroup.org/en/utilities/document-summary.cfm?docid=5C49F48E-1CE0-477F-933ACBFA169AF8CB>

Risk Management

The Risk Management section of your TAMP will discuss the concept of risk, how your agency has incorporated it into TAM, and the ways in which the consideration of risk informs maintenance practices, asset replacement or rehabilitation, and emergency response. If your agency uses a risk register, that should be included in this section.

The five-part FHWA publication, Risk-Based Transportation Asset Management, provides the following definitions of risk and risk management:

Risk is the positive or negative effects of uncertainly or variability upon agency objectives.

Risk management is the cultures, process and structures that are directly towards the effective management of potential opportunities and threats.

Background

Each state's TAMP must be "risk-based." Risk management considerations in asset management have focused primarily on bridges and tunnels, but all of your agency's policies and decisions may be viewed through the lens of risk.

For each asset to be considered, you will calculate the following:

1. Likelihood of an extreme event (e.g. flood, earthquake, asset failure), expressed as a probability.
2. Consequences to the asset (as a category of the damage or loss of function); and
3. Effects (e.g. on agency mission, life, environment, users, etc.).

To present these categories, many DOTs create a risk register, or identify a range of criticality ratings. You may find it easiest to present this in a matrix format, displaying the associated risk (either by risk type for each asset, or by type of asset). From there, you will be able to include a risk factor in project prioritization, mitigation plans, inspections, or maintenance activities.

As part of a separate FHWA rule, states must conduct a statewide evaluation of the State's existing roads, highways, and bridges eligible for emergency funding, that have required repair and reconstruction activities on two or more occasions due to emergency events, to determine if there are reasonable alternatives to any of these roads, highways, and bridges. The evaluation shall consider the risk of recurring damage and cost of future repair under current and future environmental conditions. A summary of the evaluation shall be included as part of the TAMP.

What to Include

The following sub-sections may be included in this section of your TAMP:

- Agency-wide risk management strategy
- Risk management process for TAM
 - Risk-based asset inspections
 - Risk-based maintenance planning and practices
 - Emergency response plans
- Risk management monitoring, reporting and revising

- Your agency's risk register
- Process for developing a risk management plan
 - Identification
 - Assessment
 - Evaluation and prioritization
 - Mitigation Plan
 - Monitoring Approach
 - Summary, for NHS pavements and bridges, of the evaluations of facilities repeatedly damaged by emergency events

References

- Incorporating Risk Management into Transportation Asset Management Plans.
https://www.fhwa.dot.gov/asset/pubs/incorporating_rm.pdf
 - Integrating Extreme Weather and Adaptation into Transportation Asset Management Plans, the final report of NCHRP Project 25-25(94):
[http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP25-25\(94\)_FR.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP25-25(94)_FR.pdf)
 - FHWA Risk Management Publications (5-part series):
<http://www.fhwa.dot.gov/asset/pubs.cfm?thisarea=risk>
 - NCHRP Report 632 - An Asset-Management Framework for the Interstate Highway System: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_632.pdf
 - NCHRP Report 706 - Uses of Risk Management and Data Management to Support Target- Setting for Performance-Based Resource Allocation by Transportation Agencies: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_706.pdf
 - AASHTO Enterprise Risk Management Portal: <http://www.erm-portal.com>

Financial Plan

The Financial Plan section of your TAMP includes anticipated available funding and estimated cost of expected future work. It is typically presented by asset type. This section is linked to, and reflective of, your agency's Capital Improvement Plan.

Background

TAM program funding should be presented in the context of your agency's overall funding sources and spending needs. This section will reference other sections of your TAMP which highlight asset condition and needs, and compare current needs with historical conditions and spending patterns. It is the basis for the analysis in the investment strategies section.

The focus of the section is the amount of funding that your agency has available, by funding stream or revenue source. The TAM financial plan will be linked to your agency's overall budget and Capital Improvement Plan, and will be updated in accordance with that.

What to Include

The following sub-sections may be included in the Financial Plan section of your agency's TAMP:

- Agency annual funding sources and budget
- Budgeting cycle and allocation decision process
- Overall TAM budget by activity type (e.g. maintenance, rehabilitation, data collection, etc.)
- TAM budget by asset type (and possibly sub-asset type)
- Process for the development of a financial plan
- Estimated cost of expected future work to implement investment strategies
- Estimated funding levels
- Future funding sources
- NHS pavement and bridge asset valuation and the investment necessary to maintain asset value

References

- Developing TAMP Financial Plans.
https://www.fhwa.dot.gov/asset/pubs/developing_tamp_fp.pdf
- Australian Financial Plans and Their Relevance to U.S. Transportation Agencies:
<http://www.fhwa.dot.gov/asset/pubs/aufinancialplans.pdf>
- NCHRP Report 522 – A Review of DOT Compliance with GASB:
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_522.pdf
- NCHRP Report 608 - GASB34 - Methods for Condition Assessment and Preservation:
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_608.pdf

Asset Valuation

The Asset Valuation section of your TAMP provides a description of how your agency determines the value of your assets. It also includes the current, estimated value of each of your assets.

Background

Asset valuation is a required element of annual financial reporting by government agencies to the federal government. The details on requirements are included in the Government Accounting Standards Board Statement 34 (GASB 34). Asset valuation can be used to establish asset value, track asset depreciation, and estimate the asset service life. There are different approaches to meeting GASB34, including straight-line depreciation and the “modified approach.” The data required for to estimate the asset value will depend upon the approach used. The references listed in this section provide more information on this topic.

The TAMP rule requires that agencies produce an estimate of asset value for NHS pavements and bridges. In addition to meeting a reporting requirement, asset valuation provides many benefits to TAM (and other purposes) for an agency, including:

- Asset management decision-making (e.g. comparing replacement vs. rehabilitation costs)
- Measuring loss of service potential
- Pricing and funding
- Determination of equity
- Risk management
- Sale and purchase of assets
- Benchmarking
- Taxation

What to Include

The following sub-sections may be included in the Asset Valuation section of your agency’s TAMP:

- Description of the agency’s valuation process
- Asset valuation reporting practices
- List of asset values (required for NHS pavements and bridges)
- Use of asset valuation throughout agency practices

References

- NCHRP Report 522 – A Review of DOT Compliance with GASB
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_522.pdf
- NCHRP Report 608 - GASB34 - Methods for Condition Assessment and Preservation
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_608.pdf

Investment Strategies

Federal rules define ‘investment strategies’ as “a set of strategies that result from evaluating various levels of funding to achieve State DOT targets for asset condition and system performance effectiveness at a minimum practicable cost while managing risks. “ In practice, the Investment Strategies section of your TAMP describes the process by which your agency translates your data, objectives, measures and policies into decisions about how to spend its constrained resources. This section uses the budget described in the Financial Plan section and provides at least two scenarios: 1) projected trends toward goals using the existing budget; and 2) the budget needed to meet all goals.

Background

Your agency’s TAM investment strategy is the product of the policies, goals and measures you have identified, viewed within the context of your asset data, valuation, and forecasted growth, and other factors detailed in the previous sections of your TAMP. Your investment strategy leads to a well-defined plan that specifies how funds will be allocated across assets and TAM activities in both the short and long-term.

The process could follow the following four steps:

1. Translate goals and objectives into levels of service and performance targets
2. Analyze assets to determine short-term and long-term needs
3. Determine service gaps based on targets
4. Create investment plan detailing short term and long term work

This process should lead you to a set of (at least two) scenarios:

1. Projected performance based on current funding levels; and
2. Funding amount needed to meet your targets and goals

The strategies should lead to a program of projects for inclusion in the Statewide Transportation Improvement Program (STIP) that would:

1. Achieve and sustain a desired state of good repair over the life cycle of the assets,
2. Improve or preserve the condition of the assets and the performance of the NHS relating to physical assets,
3. Make progress toward achievement of the State targets for asset condition and performance of the NHS, and
4. Support progress toward the achievement of the national goals.

The plan shall demonstrate how the strategies satisfy these four requirements.

What to Include

The following may be included in the Investment Strategies section of your agency’s TAMP:

- The relevant policies, objectives, measures and targets that are driving your investment strategy, and the reasons for the different scenarios
- Descriptions of the two (or more) scenarios
- An investment plan with budget levels, proposed projects, etc.
- Discussion of how investment strategies make or support progress towards achieving

SGR, improving or preserving the condition of the NHS, achieving state DOT targets, and achieving national performance goals.

- Process for developing investment strategies, which shall be influenced by the performance gap analysis, lifecycle planning, risk management, and financial plan.

Note: if you have not included a Future Demand section in your TAMP, a description of how projected future growth is impacting the scenarios could be included here.

References

- NCHRP Report 545 - Analytical Tools for Asset Management

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_545.pdf

- NCHRP Report 632 - An Asset-Management Framework for the Interstate Highway System http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_632.pdf

Process Improvements

The Process Improvements section of your TAMP provides a description of any methods in which your agency is engaged that are designed to measure, and provide input for improvements, to your TAM practice. TAM is understood as a process of continual improvement, and it is in this section that it can be documented.

Background

Agency implementation of TAM should be continuously evaluated, monitored and improved. The AASHTO Transportation Asset Management Guide provides a self-assessment exercise that can be used by agencies in the early adoption phase. This guide can help to highlight an agency's current position and organizational structure as it will serve to support TAM.

The improvement process can be organized into three action areas:

- Organizational alignment – readying the agency for a stronger connection between the mission and TAM
- Strengthen the enabling process – providing detailed information on the data, tools and measures that are used to support TAM decisions and actions
- Strengthen information systems and data – investing, as necessary, in the data and information systems needed to be confident in TAM decisions and actions

What to Include

The following may be included in the Process Improvements section of your agency's TAMP:

- A description of the process by which your agency undergoes assessment of the evaluation and improvement of your TAM activities
- Results of any previous findings and subsequent process adjustments

References

No specific references for this section.