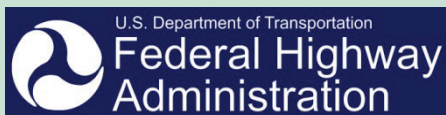


New York State DOT Work Plan for Developing a TAMP

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July 2013

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New York State DOT Work Plan for Developing a TAMP

prepared for

Federal Highway Administration

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1.0 Introduction

In July 2012, Moving Ahead for Progress in the 21st Century (MAP-21) established a performance-based highway program with the goal of improving how Federal transportation funds are allocated. The legislation requires each State department of transportation (DOT) to develop a risk-based Transportation Asset Management Plan (TAMP) that contains the following elements:

1. A summary listing of the pavement and bridge assets on the National Highway System in the State, including a description of the condition of those assets;
2. Asset management objectives and measures;
3. Performance gap identification;
4. Lifecycle cost and risk management analysis;
5. A financial plan; and
6. Investment strategies.

To provide guidance on meeting these requirements, the Federal Highway Administration is assisting the Louisiana, Minnesota, and New York DOTs to develop their TAMPs.

This document presents a work plan for developing the New York State Department of Transportation's (NYSDOT) TAMP. This work plan is based on the results from a NYSDOT TAMP workshop and a NYSDOT TAMP Working Group Meeting.

Participants at the TAMP workshop included members of the NYSDOT's TAMP Working Group, representatives from FHWA, and members of the consultant team.

Commissioner McDonald addressed the group briefly. She stressed the importance of the TAMP for providing direction for future asset management efforts and discussed the importance of managing taxpayers' money to provide the greatest public benefit. As an example, Commissioner McDonald raised the example of Governor Cuomo's new, NY Performs, which endeavors to improve decision making and bring transparency and accountability to all State agencies. Developing a TAMP is an example of how NYSDOT is already seeking these goals.

The objectives of the workshop were to:

- Walk through elements of NYSDOT's asset management process that had been identified previously as opportunities for improvement;
- Discuss existing NYSDOT resources and data related to each area;

- Discuss options for moving forward; and
- Identify key activities required to develop an initial TAMP.

The agenda for the TAMP workshop is provided in Figure 1.1

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Figure 1.1 NYSDOT TAMP Workshop #1 Agenda

Welcome and Introductions	8:30-9:00
Part 1 – TAMP Objectives	9:00-9:30
1. Overview of FHWA effort and MAP-21 requirements	
2. Discuss NYSDOT’s TAMP objectives	
3. Confirm assets to include in the TAMP	
Part 2 – Key Development Activities	
1. Performance Management Framework and Measures	9:30-10:30
a) Existing resources and related efforts	
b) Options based on best practices and national guidance	
c) Preferred option for NYSDOT	
d) Key activities	
<i>Break</i>	10:30-10:45
2. Definition of Levels of Service	10:45-11:45
a) Existing resources and related efforts	
b) Options based on best practices and national guidance	
c) Preferred option for NYSDOT	
d) Key activities	
Lunch	11:45-12:15
3. Tying TAMP to Long-term Strategies	12:15-1:15
a) Existing resources and related efforts	
b) Options based on best practices and national guidance	
c) Preferred option for NYSDOT	
d) Key activities	
4. Financial Plan	1:15-2:15
a) Existing resources and related efforts	
b) Options based on best practices and national guidance	
c) Preferred option for NYSDOT	
d) Key activities	
Break	2:15-2:30
5. Incorporating Risk into the TAMP	2:30-3:30
a) Existing resources and related efforts	
b) Options based on best practices and national guidance	
c) Preferred option for NYSDOT	
d) Key activities	
Part 3 – Summary and Next Steps	3:30-4:30

Following this workshop, NYS DOT held a TAMP Working Group meeting to discuss the sections of the TAMP not addressed during the workshop. The objectives of the subsequent meeting were to:

- Define an outline for the TAMP;
- Discuss the contents of each section of the TAMP; and
- Assign roles among NYS DOT staff.

The activities defined in this work plan are based on the results of the workshop, the subsequent Working Group meeting, and recommendations from FHWA and the consultant team. They are organized around the five questions defined in the FHWA's *Generic Work Plan for Developing a TAMP*:

1. What is the purpose of the TAMP?
2. Who should be involved in developing the TAMP?
3. What should the TAMP look like?
4. What information is needed to develop the TAMP?
5. How do we move from a concept to a final plan?

2.0 What is the Purpose of the TAMP?

2.1 WHAT ARE NYSDOT'S OBJECTIVES FOR DEVELOPING A TAMP?

NYSDOT has identified the following objectives for its TAMP:

- Institutionalize an enterprise view of asset management that combines operations and maintenance with capital planning and programming.
- Communicate asset management policies and strategies in order to make investment decisions more transparent and demonstrate how asset management compliments policies for economic development and sustainability.
- Document and prioritize opportunities for asset management improvement.
- Meet the requirements of MAP-21.

2.2 WHICH ASSETS WILL BE INCLUDED?

NYSDOT's initial TAMP will address the following assets:

- Pavements – NHS, plus the remainder of the State owned system.
- Bridges – all bridges.
- Large culverts – State owned system only.

2.3 WHO WILL CHAMPION AND MANAGE THE EFFORT?

- Rod Sechrist, Assistant Commissioner, Operations and Asset Management Division, will champion the effort at the executive level.
- Steve Wilcox, Associate Director of Transportation Maintenance will serve as Project Lead.
- Brad Allen, Office of Transportation Maintenance will serve as Project Manager.

2.4 WHAT IS THE TIMEFRAME FOR PLAN DEVELOPMENT?

NYSDOT will develop materials for the TAMP, with the goal of having a complete draft by December 2013. This provides ample time for review cycles by FHWA and DOT staff. The final TAMP will be complete by May 2014. A more detailed list of milestones and dates is provided in Section 6. These dates may have to be adjusted to account for modifications needed to comply with the final requirements established through the MAP-21 rule-making process.

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3.0 Who will be Involved in Developing the TAMP?

In addition to the champion and co-leads identified in Section 2, NYSDOT has formed a TAMP Working Group that will be responsible for TAMP development. The group members along with the offices they represent are presented in Table 3.1.

Table 3.1 NYSDOT TAMP Working Group

Role	Name	Organization
TAM Champion	Rod Sechrist	Operations and Asset Management Division
Project Lead	Steve Wilcox	Office of Transportation Maintenance
Project Manager	Brad Allen	Office of Transportation Maintenance
FHWA Liaison	Joan Walters	FHWA
Performance Measures and Forecasting	Lou Adams	Policy & Planning
Structures Management	Francois Ghanem	Office of Structures
Finance	Michael McDermott	Trans. Budget Bureau
Other modes	John Rondinaro	Technical Services
Pavement Management	Michael Rossi	Highway Data Services Bureau
Cross-Program Optimization	Alan Warde	Policy & Planning
Regional Perspective	Brian Kelly	Region 6
External Stakeholders	Marty Neveu	Upstate MPO Liaison
NYS Thruway Executive	Michael Shamma	NYSTA – Acting Chief Engineer
NYS Thruway TAM	Christina Troisi	NYSTA – Office of Asset Management
NYS Thruway Technical	Richard Garrabrant	NYSTA – Special Assistant to Chief Engineer

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4.0 What will the TAMP Look Like?

Table 4.1 provides an outline for the TAMP and describes each section.

Table 4.1 Annotated TAMP Outline

Section	This Section will...
1. Executive Summary	<ul style="list-style-type: none"> Summarize key elements of the TAMP.
2. Asset Management Objectives and Measures	<ul style="list-style-type: none"> Describe the objectives of the TAMP. Describe the scope of the TAMP – e.g., relationship to other documents, which assets are covered, and which parts of the system. Describe the objectives of the asset management program. Describe performance measures and levels of service - both customer level of service and technical level of service. Present short and long-term condition targets. Document the process used to develop the above items.
3. State of the System	<ul style="list-style-type: none"> Summarize the inventory and condition of the highway system. The TAMP will address NHS pavements, pavements on other State owned roadways, all bridges, and large culverts on State owned roadways. Describe operational trends, such as traffic growth and demand on the system. Summarize challenges, such as coordinating with local authorities, and data gaps on the NHS system. Summarize future funding versus condition scenarios. Illustrate the performance gap between existing condition levels and future condition targets. Document the process used to conduct the performance gap assessment, including a description of how non-condition related needs, such as capacity needs, have been incorporated into it.

Section	This Section will...
4. Whole Life Management	<ul style="list-style-type: none"> • Define “lifecycle costs,” and describe the importance of providing the right treatment to the right asset at the right time. • Describe how whole life costs are incorporated into the asset management process. This process includes identifying a sequence of activities such as maintenance, preservation, rehabilitation, etc. that will allow NYSDOT to achieve and sustain a desired level of service over the lifecycle of the assets at minimum practicable cost. Discuss relative costs of each state of an asset’s life, and how level of service and facility importance impacts whole life strategies. • Describe how life cycle costs are incorporated into NYSDOT’s deterioration and treatment selection models. • Present strategies for managing growth and demand. • Describe how the TAMP links to NYSDOT’s strategic plans – DOT Master Plan, Highway Safety Improvement Program (HSIP), Congestion Mitigation and Air Quality (CMAQ), Metropolitan Transportation Organization (MPO) performance-based plans, rail plan, and freight plan.
5. Risk Management	<ul style="list-style-type: none"> • Describe a process for evaluating risks associated with delivering asset management programs and projects (e.g., cost escalations, budget uncertainty, etc.), and present key risks in this category. • Describe system vulnerabilities associated with providing continuity of service (e.g., hazards, extreme events, asset failures, etc.). • Present an initial risk register that provides the following information for key risks – likelihood of occurrence, consequences of occurrence, and mitigation activities. • Describe the process used to evaluate risks and the process for incorporating them into NYSDOT’s asset management practices.
6. Financial Summary	<ul style="list-style-type: none"> • Summarize the amount of funds expected to be available for managing assets, describe where these funds will come from, and describe financial constraints. • Provide a high-level view of how the available funds will be allocated over the next 10 years. • Present funding levels in terms of the financial sustainability of the highway system, and describe how NYSDOT’s GASB 34 process is different than the sustainability approached used in the TAMP. • The process used to develop the financial plan will be documented in Section 7, <i>Transportation Asset Management Practices</i>.

Section	This Section will...
7. Transportation Asset Management Practices	<ul style="list-style-type: none"> • Present a TAM business model. • Describe the process for how funds for managing assets are allocated, including the budgeting process, the project selection process, and the identification of investment strategies. This section will address maintenance, preservation, system renewal, and strategic enhancements. • Define a TAM governance structure – who owns the TAM, how is it used, how it relates to other documents, when will it be updated, etc.
8. Recommended Investment Strategies	<ul style="list-style-type: none"> • Present investment strategies, which will be based on strategies previously developed for NYSDOT’s capital programming instructions, and on the results from the activities documented in previous sections (e.g., performance gap analysis, life cycle cost considerations, risk assessment, financial analysis, etc.). • The process used to define strategies will be documented in Section 7, <i>TAM Practices</i>.
9. Asset Management Enhancement Plan	<ul style="list-style-type: none"> • Identify priorities for asset management process enhancements, including a prioritized list of specific initiatives and a schedule. • Document the process used to identify asset management enhancements, and a process for periodically assessing the asset management process in the future.
Appendices	<ul style="list-style-type: none"> • Supporting documentation.

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5.0 What Information will be Needed to Develop the TAMP?

This section identifies the key information and work activities required to complete the TAMP. The activities are organized by the TAMP sections identified in the previous chapter.

5.1 EXECUTIVE SUMMARY

1. **Synthesize key points from the TAMP after it is complete.** This activity will be the last step in the process, once the other sections are complete.

5.2 ASSET MANAGEMENT OBJECTIVES AND MEASURES

2. **Document the performance measures that will be used throughout the asset management planning process.** At a minimum, the following measures will be used: percent of pavements in good/fair/poor condition, and percent of bridge deck area on bridges classified as structurally deficient. NYS DOT also will describe how these measures will be used in the TAMP - e.g., current condition summary, future targets, project selection, etc.
3. **Define system preservation levels of service.** NYS DOT has discussed the following approach for defining levels of service: 1) Describe the services that NYS DOT provides. 2) Separate the services that are driven by preservation needs from those that are driven by other needs. 3) Develop two sets of Level of Service (LOS) measures for each of the identified preservation oriented services as well as those needed to address MAP-21 required goals and measures. One set of LOS measures would be customer oriented and the other would be technically oriented. 4) Develop a systematic comparison between the customer and technically oriented measures that can be used to prioritize treatments/investments to/in assets, potentially using a good/fair/poor approach. 5) Determine how to define good/fair/poor. Options include condition thresholds, work recommendations, and/or public input. 6) Determine a plan for integrating non-preservation oriented services into future versions of the TAMP.
4. **Document the process for developing pavement and bridge condition LOS and establishing measures.** MAP-21 requires FHWA to certify each DOT's

asset management process. Therefore it is recommended that NYSDOT provide a description of the process used to develop each chapter of the TAMP.

5.3 STATE OF THE SYSTEM

5. **Develop templates for summarizing inventory, condition, and usage data.** NYSDOT will use stacked bars illustrating percent of the network in good/fair/poor condition. Information will be broken down by facility type (NHS, Interstate, etc.). It is recommended that the inventory table show additional inventory that will be added as part of planned highway capacity projects.
6. **Compile data needed to populate the templates.**
7. **Describe how non-asset management plans such as CMAQ and HSIP impact the asset management process.** NHS improvement strategies recommended by other (non asset management) program areas need to be included in the TAMP if they require changes to existing assets. These strategies, if implemented, could have a significant impact on future funding needs for system preservation.
8. **Describe physical and operations trends, such as traffic growth and demand on the system.**
9. **Identify challenges and solutions associated with the asset management process.** One significant challenge relates to the need to coordinate with local agencies. In New York, a significant portion of the NHS is owned and operated by agencies other than NYSDOT, primarily toll authorities and cities. NYSDOT will document this portion of the NHS (by mileage and owner) and identify steps they are going to take to include them in their asset management plan.
10. **Develop scenarios showing the relationship between future funding levels and resulting conditions.** NYSDOT is currently capable of developing these types of scenarios for pavements and bridges for a 10 year analysis period. NYSDOT also will document the approach used to model future conditions.
11. **Develop, implement, and document a process for defining condition targets.** NYSDOT will develop short and long-term targets. It is anticipated that the targets will vary by functional class.
12. **Develop, implement, and document a process for conducting a performance gap assessment.** The performance gap assessment will illustrate the relationship between current conditions and target values. The assessment process should consider non-condition related needs, such as those related to capacity that will impact system preservation needs.

5.4 WHOLE LIFE MANAGEMENT

13. **Document how lifecycle costs are incorporated into the asset management process.** NYSDOT will compile and develop materials related to the definition of life cycle costs, the importance of considering life cycle costs, the relative costs at each state of an asset's life, and how levels of service and facility importance impact whole life strategies. For example, whole life strategies applied to low volume roads are likely to differ from those applied to high volume roads.
14. **Document how lifecycle costs are addressed by NYSDOT's pavement and bridge management systems.**
 - a. Describe approach to minimizing lifecycle costs for pavement and bridge
 - b. Describe approaches to provide minimum level of service while also trying to maximize return on investment (demand recovery).

5.5 RISK MANAGEMENT

15. **Compile and summarize existing practices related to system risks associated with providing continuity of service (such as the risks associated with resiliency, asset failure, vulnerability, and extreme weather events).** NYSDOT formally addresses system risks through a number of efforts. These processes and results will be incorporated into the TAMP.
16. **Develop a process for evaluating risks associated with delivering asset management programs and projects.** Examples of these types of risks include cost escalations and budget uncertainty. In addition to developing a new risk analysis approach, NYSDOT will also identify the low hanging fruit in this area for inclusion in the TAMP. Full implementation of the new process will occur after the initial TAMP is complete.
17. **Develop an initial risk register.** NYSDOT will develop a register that defines key risks, describes their relative frequency and consequences, and defines mitigation strategies. The version developed for the initial TAMP will be viewed as an initial risk register. A more complete version will not be possible until NYSDOT can fully implement the new assessment approach defined in Activity #15.
18. **Document the process used to incorporate risk into the TAMP.**

5.6 FINANCIAL SUMMARY

19. **Compile existing information on future revenue projections.** NYSDOT will summarize expected revenue projections over a 10-year period and document the sources of the revenue.

20. **Develop, implement, and document the process for allocating funds between program areas.** NYSDOT has processes in place for allocating funds to pavements, bridges, and culverts. However, this formal budgeting process only covers a single year. Therefore, NYSDOT will develop an approach that covers a 10 year planning horizon. The allocation process will consider the asset management elements described for previous sections, including the performance gap assessment, whole life cost considerations, and the risk assessment. This section of the TAMP will present the results of the allocation process. The description of the process will be included in Section 7, *Transportation Asset Management Practices*.
21. **Develop and implement an approach for assessing the financial sustainability of the transportation system.** NYSDOT currently uses the GASB-34 modified approach. However, as currently implemented, this approach to evaluating asset value is not applicable to the TAMP. Therefore, NYSDOT will develop a new approach for assessing financial sustainability.

5.7 TRANSPORTATION ASSET MANAGEMENT PRACTICES

22. **Develop and document an asset management business model.** The model will present an enterprise view of asset management that combines operations and maintenance with capital planning and programming.
23. **Describe the process for how asset management funds are allocated.** NYSDOT will document the entire asset management resource allocation process, including how funds are allocated to program areas (Section 6), how funds are allocated geographically, the role of whole life costs in project selection (Section 4), the role of risk assessment (Section 5), the process used to select investment strategies (Section 8), etc. The intent of this section is to provide a complete story of how asset management funds are spent.
24. **Develop and document a TAMP governance process.** This process will define who owns the TAMP, how it will be used throughout NYSDOT, how it relates to other NYSDOT documents, when the TAMP will be updated, and how NYSDOT will periodically assess its asset management programs.
25. **Document process of establishing TAM business model, allocation processes, and governance.**

5.8 RECOMMENDED INVESTMENT STRATEGIES

26. **Define investment strategies.** NYSDOT has previously defined investment strategies for inclusion in its capital planning and programming investment instructions. For example, NYSDOT has defined guidance on when to apply treatments based on asset condition, and identified other considerations for when needs exceed funding levels. Examples of these other considerations

include a preservation first policy, and a set of factors used to prioritize projects. NYS DOT will build upon these strategies based on the results of the previous activities, such as the performance gap analysis, risk assessment, and financial planning, in order to define investment strategies for the TAMP. Currently, NYS DOT revisits its investment strategies every two years. The intent is for the TAMP to be a living document, but at the same time, provide more stability in terms of investment strategies so that they do not change every two years.

27. **Document the process used to define investment strategies.** This material will be presented in Section 7 (*Transportation Asset Management Practices*).

5.9 TRANSPORTATION ASSET MANAGEMENT ENHANCEMENT PLAN

28. **Define priorities for enhancing the asset management process.** NYS DOT will develop a prioritized list of initiatives, and a schedule for implementation. The improvements will address strategy, processes, data, and system enhancements.
29. **Document the process used to develop the enhancement plan.**

5.10 APPENDICES

30. **Identify and compile existing materials that will be included as appendices in the TAMP.**

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6.0 How will NYSDOT Move from a Concept to a Final Plan

Members of the TAMP Working Group will be responsible for developing the materials included in the TAMP. The TAMP Project Lead and Project Manager will facilitate all work, ensure coordination between the various parties, and combine the results. The TAMP Working Group will work under the direction of the Capital Program Team (CPT). The Capital Program Delivery Committee is responsible for final acceptance of the TAMP (see figure 6.1).

The development process will proceed largely along the schedule defined by FHWA for its series of monthly TAMP development webinars. However the activities related to process enhancements have been moved up to facilitate completion of a draft TAMP in December.

Table 6.1 presents key milestones and dates. Throughout the table the word “materials” is used to represent all raw materials that NYSDOT will provide the consultant team for incorporation into the TAMP document. For example, “state of the system materials” is used to mean all of data, tables, charts, text, etc. that NYSDOT would like to include in the State of the System section of the TAMP.

Figure 6.1 TAMP Development Organization

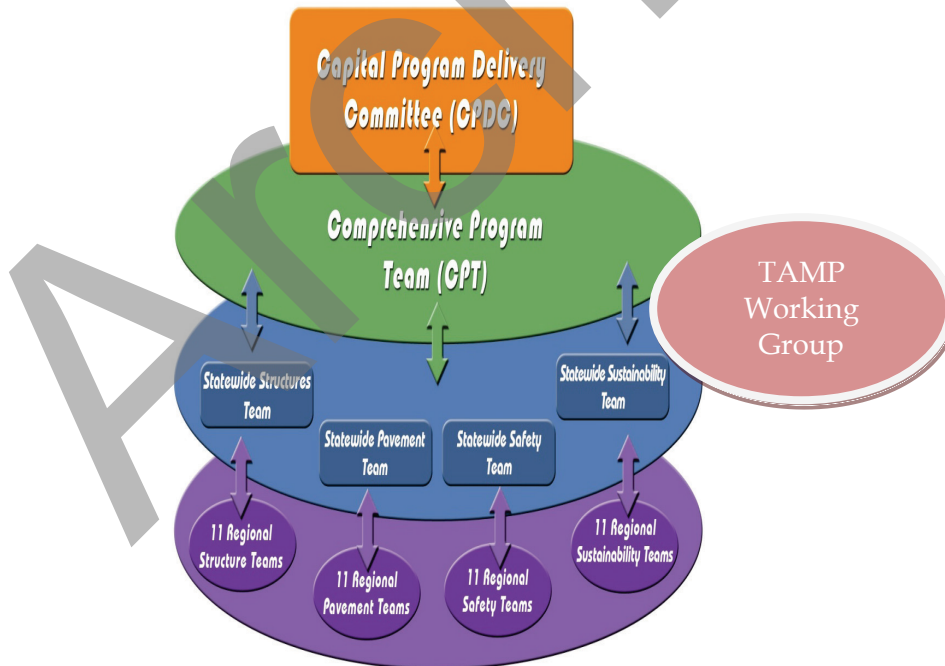


Table 6.1 Major Milestones

May 23, 2013	<ul style="list-style-type: none"> • Final TAMP outline
June 27, 2013	<ul style="list-style-type: none"> • List of performance measures (#2) • Approach for presenting the performance gap assessment (approach for #12) • Approach for target setting (approach for #11) • Approach for developing levels of service (approach for #3)
July 25, 2013	<ul style="list-style-type: none"> • Risk approach (approach for #15, #16, #17) • Outline for the financial plan section (approach for #19, #20, #21)
July 31, 2013	<ul style="list-style-type: none"> • The following materials to the NYSDOT TAMP Project Manager <ul style="list-style-type: none"> – Performance measure materials (#2) – Levels-of-service materials (#3 and #4) – State of the system materials (#5 through #8) – Performance gap materials (#10) – Lifecycle cost materials (#13, #14) – Description of existing risk practices (#15) – Financial plan materials (#19, #20, #21) – Partial asset management practice materials (#22, #23, and #25)
Sept 15, 2013	<ul style="list-style-type: none"> • The remainder of the materials to NYSDOT TAMP Project Manager
Nov 15, 2013	<ul style="list-style-type: none"> • All materials to consultant team
Dec 31, 2013	<ul style="list-style-type: none"> • Complete draft TAMP
May 22, 2014	<ul style="list-style-type: none"> • Final TAMP

Following the development of this work plan, NYSDOT’s TAMP Project Lead and Project Manager met with members of the TAMP Working Group, representatives from FHWA, and the consultant team to develop a more detailed action plan. The action plan, which is provided in Appendix A, defines a series of actions and deliverables for each work item defined in Section 5. In addition, each action has been assigned to a NYSDOT staff member, along with a deadline. The action plan was then distributed to members of the NYSDOT TAMP Working Group, who are responsible for developing the materials that will be incorporated into the TAMP.

A. NYSDOT TAMP Action Plan

Work Plan Section	Work Item	Action Item	Deliverable
5.0	0	Develop a TAMP review process	Review plan: reviewers, distribution mechanism, review period, method for addressing comments
5.2	2	Define measures to be used in item 6	Definitions of NYSDOT selected measures
5.2	2	Describe how each measure is used	Narrative
5.2	2	Narrative on need for economic benefit measures	Narrative
5.2	3	Narrative on current versus future state for Level of Service	Narrative
5.2	4	Narrative on process for performing 2 and 3	Narrative
5.3	5	Establish standard format for presenting system condition data	Example charts: stacked bar r/o/y/g over time (10 years back)
5.3	5	Establish format for presenting inventory	See Work Plan
5.3	6	Create final condition charts based on format from 5	Final Charts
5.3	6	Populate Inventory Table	Completed Current Inventory Table
5.3	7	Narrative on if/how CMAQ and HSIP impact TAM investments	A description of how investment decisions made based on HSIP and CMAQ impact asset conditions and how that is accounted for in TAM practices.
5.3	8	Narrative on operational trends/ charts	Narrative and charts describing future trends in the operational conditions on NYS highways.
5.3	9	Narrative on other current challenges. Could include: Regional Economic Development Councils, NYWorks, Fracking, data collection on local Federal Aid roadways	Narrative describing each challenge as it currently presents itself to NYSDOT.
5.3	9	Narrative on managing assets we don't own portions of the system we don't own: e.g. Thruway, MBTA, Bridge Authority, Local-owned NHS	Narrative on incorporating TAM requirements into MPO Performance based plans, authority capital programs. How can we handle local-owned NHS pavements outside of MPOs?
5.3	9	Plan for engaging Thruway, maybe MTA, MBTA	Identify a Thruway member for the Team
5.3	9	Develop a plan for engaging with all agencies that own NHS assets	Engagement plan: audience, purpose, content, feedback mechanism, role in TAMP development

Work Plan Section	Work Item	Action Item	Deliverable
5.3	9	Identify non-State NHS outside of MPO areas	List of segments, and owners
5.3	10	Develop charts for pavement and bridges showing diverging condition trends for pavement and bridge based on change to preservation first strategy	Leverage Lou's diverging line charts
5.3	10	Narrative explaining benefits of preservation first strategy	Leverage Steve's white paper
5.3	10	Multiple-line charts showing condition trends from various funding levels	Leverage Ron's analysis
5.3	10	Narrative explaining impact of funding on conditions.	Based on charts provided from analysis. Leverage Ron's analysis
5.3	11	Define short term targets - % of preservation & capital need addressed, years 1-5	Narrative defining targets
5.3	11	Define long-term targets - modeled condition following anticipated funding applied following selected strategy, stratified by infrastructure class - 10 year horizon	Narrative defining targets
5.3	11	Process for setting short-term targets	Narrative of CPT process used to establish goal of addressing 70% of preservation need.
5.3	11	Process for setting long-term targets	Narrative of how we model future conditions based on selected strategy and how that drives selection of a target.
5.3	12	Performance Gap assessment	Narrative of how we balance risks between asset classes and programs to seek a stable infrastructure with anticipated funding.
5.4	13	Lifecycle costs in TAM Process	Narrative of how life cycle costs are incorporated - follow points in outline, bridge, pavement culverts
5.4	14	Lifecycle costs in BMS & PMS	Explanation of how life-cycle considerations factor into bridge and pavement needs model and treatment selection
5.4	14	Demand recovery example	Narrative on how demand recovery strategy works.
5.4	14	Culvert needs modeling	Discuss current state of culvert modeling/treatment selection and lack of standard decision tree and needs for models/software.

Work Plan Section	Work Item	Action Item	Deliverable
5.5	15	Risk narrative	Description of risk-based practices incorporated in NYSDOT's TAM business practices following outline.
5.5	16	Risk management practices	Document initial practices for: 1. developing and updating risk register, 2. ensuring that risk register is used to drive TAM practices and policies.
5.5	17	Initial Risk Register - format	Establish a format for recording risks. Reach out to Kim and Todd.
5.5	17	Initial Risk Register - known risks	Begin to enter risks into register. Start with risks from narrative above and add in all gaps identified in the plan.
5.5	17	Initial Risk Register - remaining TAM risk	Hold brainstorming session to finish risk register.
5.5	17	Risk Gaps	Identify risks without mitigation strategies as gaps.
5.5	18	Incorporating Risk Management into TAMP	Document the process followed for item #17.
5.6	19	Current year funding: All non transit funding separate out HSIP and CMAQ and proportion out local investments in non-FA infrastructure	Table of funding levels by source, category and year
5.6	19	5 year projection for TAM funding, minus CMAQ and HSIP	Five year projection from Governor's enacted budget showing sources; published 5-year plans for Authorities and metros.
5.6	19	Yr 6-10 projection for TAM funding	Estimated from above.
5.6	20	Narrative on allocation setting	1. dividing between statewide categories, 2. within categories dividing between pavement and bridge (bridge cost and risk drive prejudice toward bridge needs).
5.6	20	Funding levels for pavement, bridges, (and large culverts?) for 10 years based on above.	Table of projected investments by asset, infrastructure type, and year.
5.6	20	Narrative on need for local data to support the above system	Currently rely on locals to self-report conditions only at project locations. No ability to model conditions or needs for local owned non-NHS federal aid system
5.6	20	Narrative on lack of knowledge on local investments other than federal match	Narrative explaining difficulty in projecting strategies for local owned system due to lack of knowledge of local investments in Federal Aid system

Work Plan Section	Work Item	Action Item	Deliverable
5.6	21	Sustainability Index	Narrative with charts describing investment present and future compared to total need per year, infrastructure type, and asset type.
5.7	22	Business Model	Narrative with graphics. Draw from business model presentations and CPU guidance. What are the roles and responsibilities of the various business groups? How do they interact? List deliverables or required actions.
5.7	23	Investment Plan	Narrative of how money is spent on the program. Narrative, heavily from CPU instructions, setting the rules for selecting investments. Include all details that will be consistent between CPUs, leave out details that will be modified with each update, e.g. specific formulas for bridge/pavement indices.
5.7	24	TAMP Governance	Narrative on policies and practices for owning, maintaining, updating and using TAMP to drive TAM.
5.7	24	TAM Practice Gaps	Identify areas for improvement: follow up using CPS, better integration of maintenance and capital strategies, etc.
5.7	25	Document process	Narrative documenting process, mostly from 2011, that established 22 and 23.
5.8	26	Investment Strategies	Narrative describing strategies that we are employing to make investment decisions: preservation first, demand recovery, targeted enhancements, etc.
5.8	27	Document process for establishing investment strategies	Document the process followed to establish item 26.
5.9	28	Gap Register	List of identified gaps in TAMP including: Description of gap, relative importance, strategy to address gap, timeframe to address gap, owner responsible for addressing gap.
5.9	29	Gap Process	Narrative documenting process for identifying, prioritizing, and developing strategies to close gaps.
5.9	29	Strength Register	List or narrative of activities that we completed before starting to develop our TAMP (unofficial for FHWA).
5.10	30	Identify items for appendices	List of items to be compiled for appendices.
5.10	30	Compile appendices	Appendices

Source: NYSDOT