AASHTO CPBM TAM Subcommittee

TAM Strategic Action Plan

About the Plan

Transportation asset management is an area of great importance to state departments of transportation (DOT) and other transportation agencies. As defined in the transportation legislation Moving Ahead for Progress in the 21st Century (MAP-21), transportation asset management (TAM) is a "strategic and systematic process of operating, maintaining, and improving physical assets… that will achieve and sustain a desired state of good repair over the life cycle of the assets at minimum practicable cost."

This TAM Strategic Action Plan establishes a common agenda for advancing TAM knowledge and practice for the American Association of Transportation Officials (AASHTO) Committee on Performance-Based Management (CPBM) Subcommittee on Asset Management, in coordination with the Subcommittee's partners and stakeholders.

Plan Objectives and TAM Vision

The plan is intended to help transportation agencies – and the national-level organizations that play a key role in setting a TAM research agenda and delivering TAM research – meet the needs of today while continuing to advance the state of practice towards a long-term vision of multi-modal transportation asset management.

The following vision was established by a representative group of TAM subcommittee members and partners.

Sound investments
That consider long-term needs
Data-driven decisions
That maximize performance of our transportation system
A sustainable and inclusive framework
That recognizes the changing world we live in

The Benefits of TAM

Sustained asset condition, performance, resilience, and longevity. Asset management involves maintaining the asset condition over the asset's lifetime. Improved condition results in improved performance and ultimately extends the life of an asset compared to the alternative of continually deferring maintenance.

Improved accountability. When asset management practices are embedded in an agency, staff are held accountable within the agency and to customers and stakeholders to follow TAM practices and consistently maintain the assets in a state of good repair

Increased efficiency and effectiveness. When assets are managed following an agreed upon management strategy, efficiency and effectiveness are improved. Regular maintenance can be planned and scheduled, reducing disruption to service.

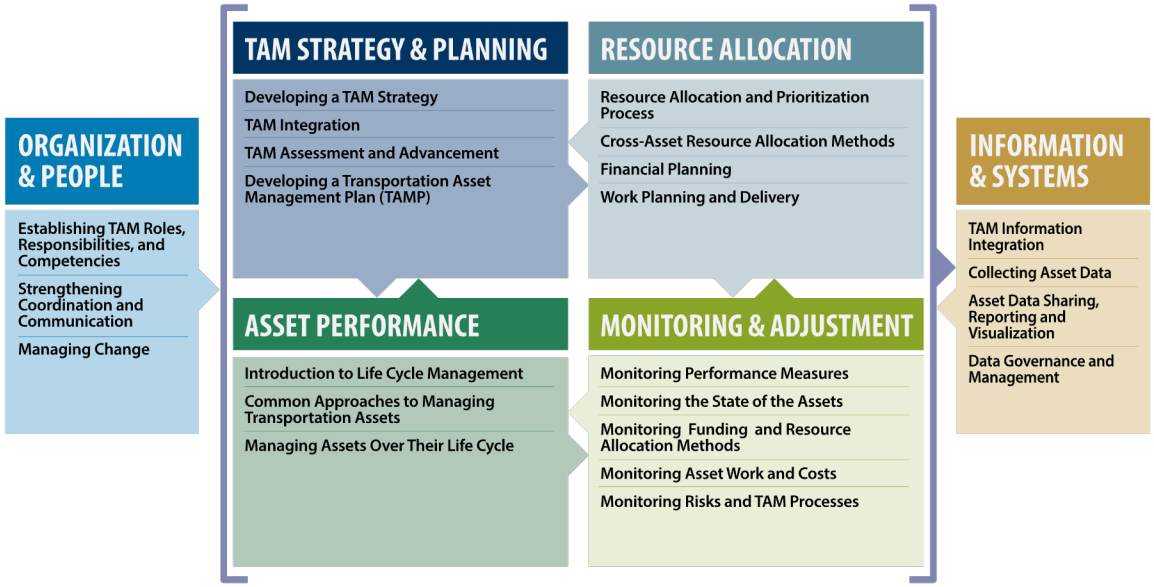
More benefit for each dollar invested. Transportation assets cost money to build, maintain, operate, and use. By stressing the importance of life cycle planning and costs and placing agreed levels of service at the core of the asset management process, TAM helps to ensure that the benefits delivered by the network are maximized, while the costs of providing, maintaining, and using it are minimized.

Reduced risk exposure. When assets are maintained and managed consistently and resilience is improved, the agency reduces the exposure to risk.

Improved coordination and communication. TAM helps improve resource allocation and coordination between agency areas on asset management related projects and maintenance.

Plan Organization

The plan is organized around the TAM Framework introduced in the *AASHTO TAM Guide* in order to clarify and reinforce alignment around common needs and objectives. The TAM Guide Framework groups the components of asset management into six areas.



The AASHTO TAM Guide TAM Framework

CPBM TAM Subcommittee

TAM Strategic Action Plan

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<< Near Term (1-3 Years) **Long Term** (5-10 Years) **>>**

Committee Activities

Integrate the Research Process into Committee Structures (XC)

Align research needs statements and committee business processes with the TAM roadmap to ensure focused results, sharing ideas and research status to capitalize on synergies. Establish mechanism to coordinate monthly knowledge transfer on research progress and accomplishments. Conduct coordination meetings with related committees, including those of the Transportation Research Board (TRB), the American Public Transportation Association (APTA), and the Association of Metropolitan Planning Organizations (AMPO).

Develop AASHTO TAM Recommended Practice (AP)

Provide guidance and examples on how to develop TAM plans for all asset classes.

Develop Methods to Assess Research Impact (XC)

Establish methods, measures, and standard criteria to assess impact of TAM research.

Connect with IAM Standards and Bodies (SP)

Align TAM with ISO/international practice including American Public Works Association (APWA) and Institute of Public Works Engineering Australasia (IPWEA). Strengthen connections to the World Road Association (PIARC).

Internal TAM Workforce Development Workshop (OP)

Develop and deliver a workshop to provide agencies with tools to enhance staff understanding and buy-in for TAM.

TAM Framework Key

- TAM Strategy and Planning (SP)
- Organization and People (OP)
- Asset Performance (AP)
- Resource Allocation (RA)
- Monitoring and Adjustment (MA)
- Information and Systems (IS)
- Cross-Cutting Topics (XC)

Implementation Activities

Identify Noteworthy TAM Plans and Practices (SP)

Provide a framework where states can learn from peers and noteworthy references, incorporating elements of the structure, description, and approach as desired.

Provide Training on TAM Data Visualization (IS)

Address challenges that TAM practitioners face in condensing TAM into enjoyable and understandable pieces for different audiences.

Develop TAM Committee Onboarding Procedure (OP)

Educate agency employees regarding existence, mission, opportunities for involvement, and inspire leaders to encourage participation by employees of the majority of US states and other agencies.

Develop National Database of TAM Experts (XC)

Develop and maintain web-based index of TAM experts.

Develop Asset Management Student Exercises (XC)

Integrate Asset Management into college-level courses to motivate/ expose young professionals to TAM.

Align Data with Federal Reporting Requirements (AP)

Align disparate data needs for Federal planning and reporting.

Identify Strategies to Adjust Between TAMPs (MA)

Identify strategies for making adjustments based on performance between asset classes. Ensure direct linkages between condition assessment, performance management, and project prioritization.

TAM Strategic Action Plan (continued)

<< Near Term (1-3 Years) **Long Term** (5-10 Years) **>>**

Assess Benefits Realized from TAM (SP)

Research approaches to show quantifiable value and benefits of TAM to continue to promote and mature TAM practices.

Support TAM and TPM Education, Training and Workforce Development (OP)

Develop and lay the foundation for multiple tools, curriculum, and certification programs related to TAM and TPM.

Establish a Risk and Resilience Research Program to Develop National Standards (MA)

Establish a series of individual research projects born out of NCHRP 23-09 to yield a collection of tools and techniques for agencies' all-hazards risk and resilience analysis.

Support Data Governance through BIM (IS)

Research BIM applications to support DOTs' data governance.

Integrate Required Planning and Performance Processes (SP)

Identify noteworthy practices in how DOTs and MPOs are linking and including TAM decisions in traditional planning processes.

Assess Successful Practices for Managing Uncertainty (SP)

Survey and interview State DOTs and others as to their practices during COVID.

Incorporate Risk at Project and Network Levels (MA)

Develop methods to allow agencies to incorporate quantitative risk assessment at project and network levels. Support risk and resilience being on par with traditional performance measures.

Implement Guidance on System Level Asset Valuation (RA)

Support implementation activities for the forthcoming *Guide to Computation and Use of System Level Valuation of Transportation Assets*.

Evaluate Federal Measures and Metrics for Pavements (AP)

Evaluate and assess existing national-level performance measure requirements to determine applicability and usability of these measures to state-level TAM decision making.

Advance Asset Data Collection Technology (IS)

Research to understand what the latest technologies for asset analysis can offer an agency as well as guidance on how frequently that information needs to be generated.

Assess Socio-Economic Indicators in TAM (SP)

Research the use of equity, economic, and environmental indicators in TAM calculations and decision-making.

Improve Asset Performance by Bundling Capital Projects (RA)

Research effective corridor planning strategies that promote sustainable capital asset improvements that impact asset class performance and other performance areas.

Develop Corridor Planning and Allocation Approaches (RA)

Organize a framework for corridor (or system/area) plans that can be used for efficient asset management and resource allocation.

Develop Detailed TAM Case Studies (XC)

Identify and develop multi-media case studies that document, in great detail, how a transportation agency implemented a TAM program or practice.

Incorporate Change Management in TAM (OP)

Develop a framework, recommended actions, and synthesis of noteworthy practices for agencies to use in incorporating change management strategies in TAM practice.

Conduct Regional and National Peer Exchanges (XC)

Continue to deliver thematic TAM peer exchanges at the regional and national levels for targeted professionals.

Create Catalog of Condition Assessment Protocols (AP)

Document and provide examples of condition assessment for all types of assets.

Engage Stakeholders in TAM (OP)

Develop communication tools designed to engage stakeholders in developing TAM strategies for various asset categories and agencies.

Develop Data Governance Guidebook (IS)

Create knowledge throughout the TAM community on data governance.

Synthesize Internal Staff Development Best Practices (OP)

Synthesize best practices for workforce development and training in order to enhance the capabilities of a TAM team/staff or attract internal staff to become involved in TAM program/implementation.

Develop TAM Big Data Case Studies (IS)

Create case studies addressing noteworthy applications of big data analytics to TAM.

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TAM Strategic Action Plan

Plan Development

A 2019 TAM Strategic Planning Workshop, held on October 17-18, 2019 in Irvine, California, provided the foundation for the plan. With over 45 attendees representing more than 35 organizations, the discussions brought together many voices and perspectives to identify, define, and prioritize the specific opportunities for TAM advancements that will deliver real value to transportation agencies.

At the outset of the 2019 TAM Strategic Planning Workshop, participants defined the goals and desired outcomes to be addressed by the TAM Strategic Action Plan that would shape the continued advancement of TAM practice over a ten-year timeframe.

Timeframe	Desired Products and Outcomes
2 Years	• **Product:** High level CEO instruction in what asset management can do for an organization and its long term investment decisions • **Outcome:** Embedded TAM business process that are sustainable across major leadership changes
3-5 Years	• **Product:** Means and methods for before-and-after assessments • **Product:** Performance measures for additional assets • **Outcome:** Achieve greater consistency within asset classes • **Outcome:** Fully integrated agency asset management, performance management, and risk management

5-10 Years	• **Product:** Multimodal framework for TAM that enables consistency in language and approach across modes and assets
	• **Outcome:** TAM processes, people, and information are working systematically
	  ○ Transportation programs, project scopes, and budgets are set based on outputs of TAM analyses
	  ○ TAM is integrated into all lines of business, and job descriptions include TAM
	• **Outcome:** Increase the credibility of TAM programs by shifting from reporting-only to decisions based on investment scenarios
	  ○ Optimum lifecycle strategies can be utilized on all assets
	  ○ Increased use of multi-objective modeling techniques
	  ○ Use greater percentage of model recommendations
	• **Outcome:** Adopt meaningful performance measures that incorporate user experience
	• **Outcome:** Implement TAM culture throughout all levels of the agency
	• **Outcome:** Advance TAM practices towards international standards
	• **Outcome:** Provide asset owners with TAM tools for addressing critical challenges
	• **Outcome:** Increase availability of human and information resources for TAM: findable, searchable, usable

Workshop survey and polling data helped establish baseline and desired future maturity levels for a variety of key TAM capabilities and competencies required to achieve these objectives. These data were used to help identify areas with needs best addressed by three improvement action types: implementation support, general or targeted research efforts, and the coordinated activities of the national-level organizations that play a key role in setting a TAM research agenda and delivering TAM research.

The workshop culminated with the development of over 25 specific, actionable research and action statements. The action items presented in the TAM Strategic Action Plan are synthesized from these statements, organized according to the established AASHTO TAM Guide Framework, and categorized according to the three improvement action types.

Areas of Need

TAM has been a focus area for DOTs in the U.S. for over 15 years, paralleling similar efforts to improve asset management in transportation and other infrastructure-intensive industries in the U.S. and abroad. Over this period, transportation agencies have worked to increase their understanding of the value and performance of existing assets; and implement improved asset management systems and approaches.

Much progress has been made in data driven decision-making, improved performance management, strengthened knowledge amongst practitioners, and the availability of resources to support TAM. The TAM Strategic Action Plan reflects these accomplishments while also highlighting the areas where future progress must break substantial new ground.

In certain areas, where the maturity of TAM practice is relatively high, there is the greatest need for implementation support. Further advancement in these areas is generally captured by the committee activities and implementation activities included in the plan. Examples include:

- **Asset inventory and condition development**
- **TAM plan development**
- **Setting and reporting agency performance measures**

In other areas, where maturity is generally lower, there is a greater need for general or targeted research. These needs have been translated into the research activities included in the plan. Examples include:

- **Applying a structured risk management approach**
- **Implementing corridor-based investment strategies**
- **Leveraging the capabilities of big data analytics and artificial intelligence**