Transportation Planning Capacity Building Program

Developing Formal Asset Management Plans

A TPCB Peer Exchange

Location:	Columbia, South Carolina
Date:	February 5-6, 2014
Host Agency:	South Carolina Department of Transportation (SCDOT)
Peer Agencies:	Louisiana Department of Transportation and Development (LA DOTD) Minnesota Department of Transportation (MnDOT) North Carolina Department of Transportation (NCDOT)
Federal Agencies:	Federal Highway Administration (FHWA) Federal Transit Administration (FTA) Volpe National Transportation Systems Center (Volpe Center)

U.S. Department of Transportation
Federal Highway Administration • Federal Transit Administration

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE June 2014	3. REPORT TYPE AND DATES COVERED Final Report

4. TITLE AND SUBTITLE Developing Formal Asset Management Plans *A TPCB Peer Exchange*	5. FUNDING NUMBERS MJ77300 / HW2LA300
6. AUTHOR(S) Terry Regan; Scott Middleton	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Department of Transportation Research and Innovative Technology Administration John A. Volpe National Transportation Systems Center 55 Broadway Cambridge, MA 02142	8. PERFORMING ORGANIZATION REPORT NUMBER DOT-VNTSC-FHWA-14-05.
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Federal Transit Administration/Federal Highway Administration Office of Planning & Environment/Office of Planning 1200 New Jersey Avenue, SE Washington, DC 20590	10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT	12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

This report highlights key recommendations and best practices identified at the peer exchange on Transportation Asset Management Plans (TAMP), held on February 5 and 6, 2014, in Columbia, South Carolina. This event was sponsored by the Transportation Planning Capacity Building (TPCB) Peer Program, which is jointly funded by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA).

14. SUBJECT TERMS Keywords: asset management, asset management plans, MAP-21	15. NUMBER OF PAGES 22
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT Unlimited

Contents

Introduction

This report highlights key recommendations and noteworthy practices identified at the peer exchange on "Developing Formal Asset Management Plans" held on February 5-6, 2014 in Columbia, South Carolina. This event was sponsored by the Transportation Planning Capacity Building (TPCB) Peer Program, which is jointly funded by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA). Additional information about the TPCB Program is available on page 15 of this report.

Overview of the Peer Exchange

Goals of the Peer Exchange

The South Carolina Department of Transportation's (SCDOT) Office of Planning and Asset Management has been tasked with producing a risk-based transportation asset management plan (TAMP), as required by the Moving Ahead for Progress in the 21st Century Act (MAP-21). The primary goal of this peer exchange was to build the capacity of SCDOT staff to implement a formal asset management process by drawing upon the experiences of the three peer State DOTs.

Through this peer exchange SCDOT staff sought to gain a better understanding of the following:
- Coordinating the many disciplines involved in the asset management process, including finance, planning, engineering, and maintenance;
- Integrating several of the Federal- and State-required plans developed by SCDOT;
- Using asset management principles to make informed funding decisions that extend the service life of SCDOT's highway assets; and
- Developing a formal TAMP that satisfies MAP-21 requirements and meets the unique needs of SCDOT.

Selecting the Peers

In advance of the exchange, the TPCB program identified State DOTs that would be able to share their experiences, lessons learned, and recommendations for the asset management process. TPCB staff selected peers based on their experience in developing and implementing formal risk-based asset management plans as required by MAP-21. Special attention was granted to agencies involved in FHWA's Transportation Asset Management Plan Pilot Program, which has supported the development of TAMPs in three States to serve as models to other State DOTs. Two of the three peers have participated in this program. Each of the chosen peers brought a unique perspective to the peer exchange, including finance, planning, traffic engineering, and maintenance.

The representatives from the three State DOT peers for the exchange were:
- **Michael Bridges,** Undersecretary, Office of Management and Finance – Louisiana Department of Transportation and Development (LA DOTD)
- **Kirby Becker,** Planning Director, Office of Transportation System Management – Minnesota Department of Transportation (MnDOT)
- **Jennifer Brandenburg,** State Asset Manager, North Carolina Department of Transportation (NCDOT)

A full list of attendees is available in Appendix B of this report.

Format of the Event

The two-day peer exchange was held on February 5-6, 2014, at SCDOT in Columbia, SC. Participants included the three peer presenters, SCDOT staff, FHWA South Carolina Division Office staff, FHWA North Carolina Division Office staff, FHWA Louisiana Division Office staff, and facilitators from the Volpe Center. The exchange began with a brief round of introductions and background information on asset management and SCDOT's goals for the exchange. The two sessions on the first day focused on the existing inventory and asset management systems in place at each of the peer agencies and asset management data needs in general. These sessions included presentations from each of the three peers followed by discussion with the host agency and other participants in the exchange. On day two, the three peers presented their agencies' experiences in planning for asset management systems and implementing formal asset management plans. After a final question-and-answer session, the event concluded with action planning that summarized the key findings of the exchange. An agenda for the program is available in Appendix C of this report.

Key Concepts in Asset Management

What is Asset Management?

According to FHWA, transportation asset management is a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively throughout their lifecycle. By establishing an underlying, agency-wide framework for asset management, State DOTs can incorporate asset management principles into their standard business operations. Effective asset management within a State DOT results in a general state of good repair over the lifecycle of a State's highway assets, including pavements, bridges, and other physical assets. Asset management supports short and long term resource allocation decisions that are based on data analysis that considers engineering needs, lifecycle cost, and investment risk.

The benefits of effective asset management plans are numerous. Asset management enables states to improve system performance while also operating in a financially sustainable manner. The development of asset management plans results in improved coordination between the maintenance, preservation and the capital programs within a State DOT. The asset management plan is also an important means of incorporating asset management into the long range planning process.

Asset Management and MAP-21

In 2012, the Moving Ahead for Progress in the 21st Century Act (MAP-21) required each State to develop a risk-based asset management plan for the National Highway System (NHS) to improve or preserve the condition of the assets and the performance of the system (23 U.S.C. 119(e)(1), MAP-21 §1106). Forthcoming rulemaking from the U.S. Department of Transportation (USDOT) will establish the formal process of developing State asset management plans for the NHS. Once the final rule is in place, states will need to complete the formal TAMP by the second fiscal year beginning after the release of regulations for the asset management plan development process.

Under MAP-21, each State's TAMP will need to include several elements, including: asset inventories; bridge and highway condition data; lifecycle cost analysis; performance gap analysis; and a financial plan that evaluates various investment options. The TAMP will also need to take a risk-based approach that prepares for the risk of extreme weather, climate change, seismic activity, and preservation needs. Asset management under MAP-21 will require planners to focus on using pavement and bridge data to manage the transportation system for performance and condition in the long-term.

Although this peer exchange was an excellent opportunity for SCDOT to learn about new Federal requirements, the exchange focused more broadly on developing a successful asset management system, in addition to meeting expected requirements. MAP-21 provided a valuable point of reference for the exchange and will provide a useful foundation for SCDOT as the agency develops its formal TAMP.

Focusing the Conversation

To focus the discussion at the peer exchange, the TPCB program included the following discussion items in the agenda it sent to the peers and host agency in advance of the event. The peer exchange was organized in four sections: 1) Existing Inventory and Asset Management Systems; 2) Asset Management Data Needs; 3) Planning for an Asset Management System; and 4) Implementing a Formal Asset Management Plan. Peers developed PowerPoint presentations in response to these questions, which the TPCB program collected prior to the event and compiled into a single document. These materials are available in a supplemental appendix to this report.

Session 1: Existing Inventory and Asset Management Systems

- Your State's basic background
- Your overall approach to asset management
- Motivation for asset management in your State
- Specific asset management system in place in your State

- Assets included in the asset management process in your State

Session 2: Asset Management Data Needs
- Data necessary for asset management
- Setting data governance/management policies
- Data gathering
- Data interoperability and consistency
- Dealing with data deficiencies

Session 3: Planning for Asset Management Systems
- Advantages and disadvantages of specific asset management systems (e.g. AgileAssets)
- Unifying multiple asset management systems
- Determining appropriate resource allocation between preservation and mobility
- Making the most of limited resources
- Connection between asset management and MAP-21
- Connection between asset management and financial planning, as required by MAP-21
- Relationship between asset management plans and other plans
- Other State/Federal requirements

Session 4: Implementing a Formal Asset Management Plan
- Organizational structure required to support asset management functions
- Individuals and offices that should be involved in the asset management process
- Resources required to do asset management effectively
- Preparing a plan in-house vs. with a consultant

Discussing Key Concepts
After each of the four sessions, the facilitator allowed time for the peer exchange participants to respond directly to the peers with questions and comments. Key questions generated by peer exchange participants during this portion of the peer exchange are listed below.

- What is your State's timeframe for developing the formal TAMP?
- How did your agency decide what assets to include in the TAMP?
- What are the advantages and disadvantages of hiring a consultant to help develop the TAMP?
- How do you plan to involve the public in the development of your agency's TAMP?
- Has your State attempted to connect the TAMP to the economic impact of asset management?
- How does your agency's TAMP reference freight planning issues?
- How difficult will it be for your agency to obtain support for the TAMP from the DOT districts?
- How does your agency interface its financial planning with its asset management system?
- How does your agency determine appropriate expenditure on pavement? How is funding for preservation distributed geographically?
- What office or individuals did you include in the risk assessment process at your agency?
- What kinds of risk analysis does your agency conduct?
- How does your agency define risk?
- How does your State plan to revise or update its risk analysis?
- How often does your State collect pavement data on the NHS?
- How is maintenance work recorded in your pavement management system?
- How much does your agency spend on data collection and analysis annually? How is data collection funded? How does your agency balance the cost of data with the cost of maintenance work?

Key Recommendations and Lessons Learned

Over the course of the two-day exchange, peer agency staff delivered presentations and engaged in discussions about their experience with the asset management process. This section highlights recommendations for SCDOT and other states that are developing formal TAMPs. It summarizes the key recommendations that emerged from the peer exchange and profiles noteworthy practices employed by peer agencies.

A. Preparing for an Asset Management Plan

During the first session of the exchange, the peers provided background on the necessary elements for effective asset management. The peers also suggested training, literature, and other resources that State DOTs may find useful during the development of the TAMP.

Necessary Resources for Asset Management
Throughout the exchange, the peers explained the elements necessary for a successful asset management process. Although each State took a different approach to asset management, all three peers commented on the value of stakeholder involvement, sound roadway data, and leadership support. The peers also noted that having an experienced asset management project manager is also useful to support the creation of the TAMP. Finally, the peers agreed that a well-formulated long-range transportation plan is also helpful in developing the TAMP.

Useful Resources Available to All States
Regardless of a State's level of familiarity with the asset management process, there are several resources available to all states. Many of these resources are listed in Appendix D of this report.

> *Best Practice Example:* Through the National Highway Institute (NHI), FHWA offers a series of training courses related to asset management. LA DOTD's entire executive staff completed NHI Course Number: 131106, which offers a one-day overview of asset management and includes the option of an additional one-day agency-specific asset management workshop. LA DOTD found that this course was useful in generating support for the TAMP at the executive level.

Organizational Culture and Management Support
In addition to leadership support for the formal asset management plan, the peers commented on the value of broad organizational acceptance of asset management principles. An agency that is fully committed to asset management, one peer argued, is more likely to follow through with the course of action laid out in the TAMP. Because individuals can leave an organization at any time, embedding asset management principles within an agency is important to ensure continuity.

All peers agreed that top-level management within a DOT must support and promote the idea of asset management in order for TAMPs to be successful. Strong leadership behind the asset management plan is necessary to connect the many business areas of a DOT that are involved in asset management.

B. Developing a Formal Asset Management Plan

Throughout the exchange, the peers shared their hands-on experience drafting and developing the TAMP, with a focus on effective strategies for collaboration and leadership.

Working Collaboratively
Because of the interdisciplinary nature of asset management, the peers noted the importance of an organizational structure that supports cooperation across offices and business areas. The asset management process requires the involvement of a wide range of disciplines within a State DOT, including planning, engineering, finance, legal, and maintenance. Proper asset management encourages planners, for example, to incorporate long-term maintenance costs into their project planning work.

> *Best Practice Example:* One way to foster collaborative decisionmaking is to establish an asset management steering committee with an executive-level champion. MnDOT, for example, has established a steering committee with 30 staff from all of the agency's disciplines, including

representatives of planning, bridge, materials (pavement), finance, maintenance and operations, as well as district-level staff. Within the steering committee, MnDOT also has a project management team and asset-specific work groups. Other states may choose to also include representatives from the offices of information technology, multimodal planning, traffic, safety, and data collection and analysis.

Hiring Asset Managers
Each State DOT may locate the responsibility for asset management is a different location. Some states may have dedicated asset management offices, while others may not. For states that do not have offices of asset management, creating a new asset management position can provide leadership for the development of the TAMP and relieve overburdened staff.

Best Practice Example: In order to guide the development of the TAMP, LA DOTD hired a full-time asset management engineer in the Data Collection and Analysis section of the Office of Multimodal Planning. This individual is responsible for the day-to-day management of the plan. SCDOT also has plans to hire a full-time asset management engineer.

Use of Consultants
If funding is available and staff resources are limited a suitable alternative could be utilizing consultant services. The three FHWA TAMP pilot states have made use of consultants to complete their formal asset management plans. Consultants can assist with overall organization and help facilitate formal asset management discussions. Consultants can also assist with the writing of the TAMP itself.

Best Practice Example: FHWA hired a consultant to support the three TAMP pilot states, including Louisiana and Minnesota. In addition to the consultant from FHWA, LA DOTD hired an in-house consultant to help draft the asset management plan in plain language.

C. Selecting Asset Management Systems

Forthcoming rulemaking will present requirements for pavement and bridge management systems capable of analyzing asset data and generating deterioration models. Additionally, these systems will need to be able to assess different funding scenarios and predict how they will affect the long-term performance and condition of the transportation network. One of SCDOT's key motivations for hosting this exchange was to learn about the advantages and disadvantages of specific asset management systems on the market. To achieve this goal, the peers explained their use of the many different systems and software options available.

Use of Commercial Off-the-Shelf (COTS) Software
Two of the three peers use a private company's integrated infrastructure asset management software as part of their roadway inventory, maintenance, and asset management systems.

Best Practice Example: LA DOTD uses COTS software to maintain condition and inventory data on pavement, bridges, and roadway structures in Louisiana. The agency also uses a product from the same company to coordinate its highway maintenance management program and to link data from disparate sources within the agency. Notably, LA DOTD's asset management data interfaces directly with the agency's SAP Portfolio financial system in order to track expenditures on each asset owned by the agency.

Best Practice Example: NCDOT uses COTS software for four purposes: bridge management, maintenance management, pavement management, and trade-off analysis. Through the software, NCDOT is able to review different budget scenarios and generate work plans that make the most efficient use of funding. The trade-off analysis function is an especially useful tool for prioritizing expenditures and deciding between competing objectives. As *Figure 1* demonstrates, the software's trade-off analysis function can predict the varying levels of service that will result from different budget scenarios (i.e. level of funding dedicated to pavement and bridges or the geographic distribution of funding). According to NCDOT, the ability to consolidate data and conduct trade-off analysis is one key advantage of using this COTS software.
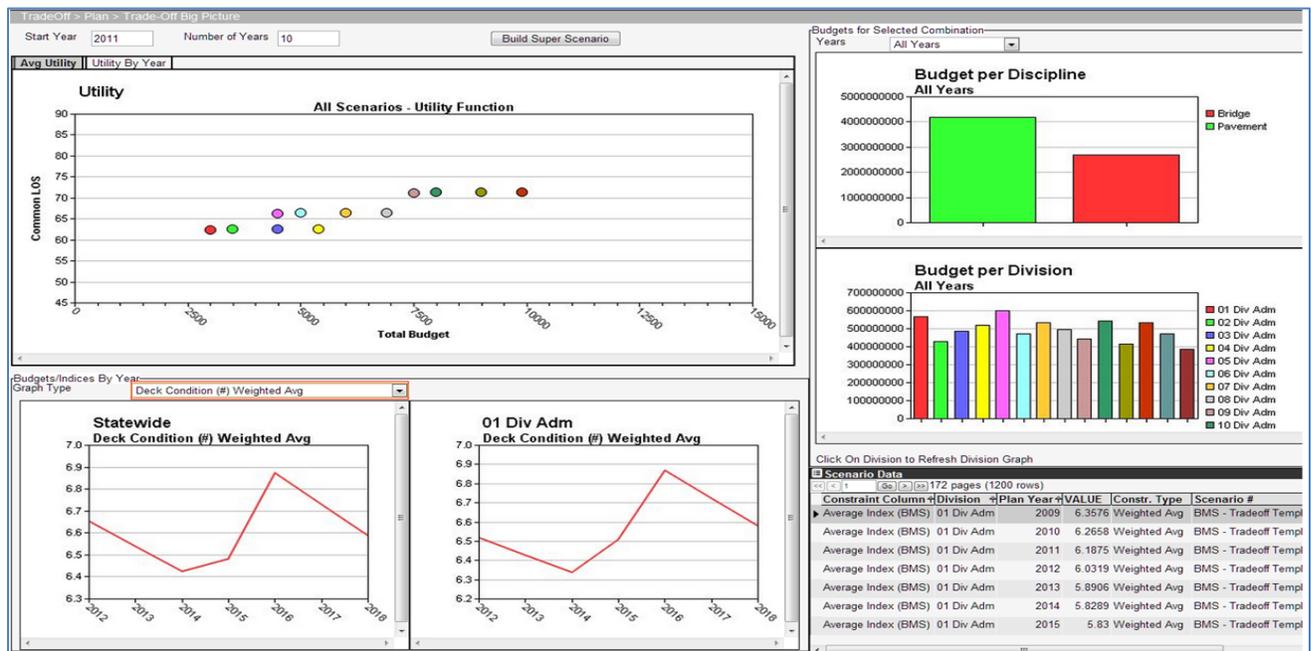
Figure 1: NCDOT's COTS asset management software allows the agency to conduct trade-off analysis to plot several useful charts, including the level of service that would result from a variety of budget scenarios (top left).

Home-grown Asset Management Systems
In addition to commercially-available asset management systems, many State DOTs also choose to independently develop systems that are unique to a given State. The peer states have developed their own pavement management systems, highway performance management systems, highway inventory data systems, and highway condition data systems.

> **Best Practice Example:** While MnDOT does not make use of COTS asset management software, the agency is in the process of developing a home-grown system called the "Transportation Asset Management System" (TAMS), which will serve as MnDOT's single source of data for managing the maintenance of roadside infrastructure. This tool will allow MnDOT to better manage roadside infrastructure data such as location, past, present and future work activities, equipment, materials, and staffing needs.

Other Asset Management Systems
In addition to commercially available and home-grown asset management systems, the peer states use several other commercially-available asset management systems, such as the AASHTOWare bridge management software BrM (formerly known as Pontis).

> **Best Practice Example:** MnDOT has chosen to integrate commercial bridge management software with the agency's home-grown Bridge Replacement and Improvement Management (BRIM) system. The BRIM system allows MnDOT to prioritize bridge investments based on risk and importance factors. As shown in *Figure 2*, BRIM generates a bridge planning index score for each bridge in the State. Each bridge's score is based on risk factors (such as fracture criticality and substandard vertical clearance) and importance factors (such as bridge length and traffic volume).

Bridges													
Review	Relative weights of hazards (a copy of the information entered at left)								Sum		Ranking		
All	25.0	20.0	15.0	10.0	10.0	5.0	10.0	5.0	100				
Other												Rank of BPI score	
	Scaled BPI times relative weight								Raw R score	Importance factor	BPI score	Entire state	Each district
brkey	rwDeck	rwSuper	rwSubs	rwScour	rwFracC	rwFatigu	rwOverW	rwOverH	rRawSco	rImporta	rScore	staterank	distran
5895	5	5	8	1	0	0	6	2	25	1.33	1	1	1
9800	5	2	11	6	6	0	6	5	41	1.39	18	2	2
4667	8	2	1	2	0	0	2	5	19	1.00	19	3	1
5900	13	5	11	1	0	5	2	2	38	1.21	24	4	1
6690	8	2	9	7	0	0	6	5	36	1.16	26	5	1
6515	9	2	4	10	10	1	4	5	45	1.32	27	6	3
09001	5	8	8	7	0	1	0	5	34	1.05	30	7	1
6517	5	2	5	10	10	1	6	5	44	1.20	33	8	4
9265	5	7	4	10	10	1	9	4	50	1.26	37	9	5
5380	5	5	8	7	6	4	2	5	41	1.05	38	10	2
4700	18	11	9	5	0	0	2	5	49	1.18	40	11	2
9300	9	8	8	4	7	5	8	5	54	1.30	40	12	6
4654	23	12	8	8	0	5	0	0	55	1.27	43	13	7
27842	5	5	11	10	10	5	4	3	53	1.21	43	14	8
9114	13	5	8	7	0	5	2	5	44	1.00	44	15	3

Figure 2: MnDOT's Bridge Replacement and Improvement Management (BRIM) system generates a bridge planning index score for each bridge that allows the agency to prioritize bridge-related expenditures based upon a bridge's importance and risk to the asset.

D. Identifying Assets for the TAMP

Beyond bridges and pavements, MAP-21 allows each State's asset management plan to focus on a set of additional assets, according to the State's unique needs and priorities. In light of this fact, the peers identified the assets included in their TAMPs and their rationale for selecting those assets.

Setting Priorities
In deciding whether to include an asset in the TAMP, each State first must consider the cost of collecting inventory data on that asset, the benefit of planning for that asset, and the abundance of that asset in the State.

> *Best Practice Example:* Minnesota's TAMP includes six assets: pavements, bridges, drainage structures, overhead sign structures, and high mast light tower structures. MnDOT has plans to include additional assets such as guardrails, noise walls, and retaining walls in the future. The agency decided upon these particular assets by considering multiple criteria: current investment; ownership; public and external expectations; the timing of other agency efforts; size (i.e. inventory); age and condition; risk to agency and traveling public; and the availability of data.

Multimodal Asset Management Plans
State DOTs that maintain transit assets may include those assets in the TAMP just as they would include any highway asset. Whether or not a State DOT's TAMP accounts for transit assets, DOTs can cooperate with transit providers to integrate asset management plans.

> *Best Practice Example:* MnDOT's transit office oversees transit providers in Greater Minnesota and has several staff members responsible for overseeing transit's role in the TAMP. MnDOT maintains an inventory of all Greater Minnesota transit-owned facilities and rolling stock. Maintenance plans exist for every transit-owned facility or transit system (for vehicles) and are updated or spot-checked annually. Similarly, NCDOT intends to use its TAMP as a model for the development of asset management plans for other modes and plans to eventually integrate modal asset management plans into a single document.

E. Data Collection and Analysis

A successful asset management plan relies on data-driven decisionmaking. The development of a TAMP

provides an excellent opportunity for agencies to consider what data they should be collecting and why.

Data Requirements
There are several types of data necessary for a successful TAMP. Inventory and condition data on pavement, bridges, and other assets must be the first priority. States should also have adequate financial data on each asset. Finally, a State must have reliable lifecycle cost data in place to make long-term decisions about maintenance and capital expenditure. These data must be accurate and up-to-date, and must include a location component. With all these forms of data in place, State DOTs have the ability to prioritize investments, create work plans, track performance, and evaluate spending decisions.

Investing in Data Inventories
Managing an asset requires either an exact or approximate inventory of that asset. Due to technological advances and changes in transportation planning requirements, states are collecting, tracking, and managing more data than ever before. Each State DOT must determine the appropriate amount to spend on data collection and management. State DOTs must also be prepared to justify data investments to legislatures and internal decisionmakers.

Best Practice Example: When considering whether to collect each additional data element, states must consider the costs of updating that data inventory and the return on investment of collecting that data. NCDOT, for example, only collects data that allow it to prioritize investments in a cost-effective manner. Right-of-way fences, for example, are not inventoried because of the high cost of collecting data and the low value of that data for decisionmaking.

While NCDOT does maintain a full inventory of all State-owned bridges and pavement, the agency conducts a sample of roadside feature assets such as signs and guardrails. The cost of collecting such data in full would be prohibitively high due to the high mileage of the State-owned system in North Carolina.

Data Collection
The three State DOT peers each provided insight into roadway data gathering strategies in place in their states. Although every State may collect data in a different way, the peers emphasized the importance of consistency in collecting accurate and complete data.

Figure 3: NCDOT's tablet data collection device

Best Practice Example: To collect accurate and consistent data on the State-owned roadways in North Carolina, NCDOT uses an automated distress vehicle to survey the interstate and primary route mileage in the State. To collect data on secondary routes in North Carolina, NCDOT developed an easy-to-use tablet data collection device with GPS capability, seen in *Figure 3*. Two-person rating crews from NCDOT use the tablets to conduct an annual windshield survey of all the secondary routes in the State.

Best Practice Example: MnDOT manages pavement condition data through its Highway Pavement Management Application (HPMA) pavement management software. The HPMA system relies on data from a MnDOT-owned van that drives the entire State highway system annually to collect pavement condition data (see *Figure 4*). With this data in place, MnDOT uses HPMA to develop funding scenarios based on pavement treatment decision trees and performance prediction models.

Data Governance and Management
Linking disparate data systems helps eliminate inaccuracy, reduce data redundancy, and promote collaboration across a State DOT. To keep costs at a minimum, State DOTs should focus on collecting

data once and using it multiple times.

Best Practice Example: All of NCDOT's management systems use common data formats and reference points. Similarly, LA DOTD is adopting a commercially available Roads and Highways software to connect data from disparate sources and eliminate data redundancy.

Best Practice Example: In order to coordinate data stewardship across the agency, MnDOT has established a Data Governance Council at the executive level.

Figure 4: MnDOT uses a van to collect roadway data on Minnesota's 12,000-mile state highway system.

The council, which represents nine data domains within the agency, sets data stewardship policies and ensures that the agency adheres to seven data principles:

- Data shall be managed as a state asset
- Data quality fits its purpose
- Data is accessible and shared as permitted
- Data includes standard metadata
- Data definitions are consistently used
- Data management is everyone's responsibility
- Data shall not be duplicated

F. Executing the TAMP

Developing a formal asset management plan is a key step in institutionalizing an asset management process within a State DOT that will allow the agency to improve system performance in a financially sustainable manner.

Finalizing the TAMP
Once the TAMP is in draft form, it should be reviewed and approved by the steering committee or other body responsible for its implementation. With the TAMP in a near-final form, the asset management steering committee should hold an in-person meeting with executive staff to solicit their input and endorsement of the plan. At that point, the State DOT must send the TAMP to FHWA to check the plan for compliance with MAP-21 requirements. When the final version of the TAMP is in place, State DOTs must then revise the plan on a regular basis.

Linking the TAMP to Other Plans
Transportation Asset Management Plans are policy documents that complement and influence other planning documents and programs at the State level. Plans with connections to the TAMP include financial plans, marketing plans, human resources plans, customer service plans, long-range transportation plans, statewide transportation improvement plans, and performance management plans. The American Association of State Highway and Transportation Officials' (AASHTO's) Transportation Asset Management Guide summarizes the ideal connections between the TAMP and other plans and programs, as shown in *Figure 5*.
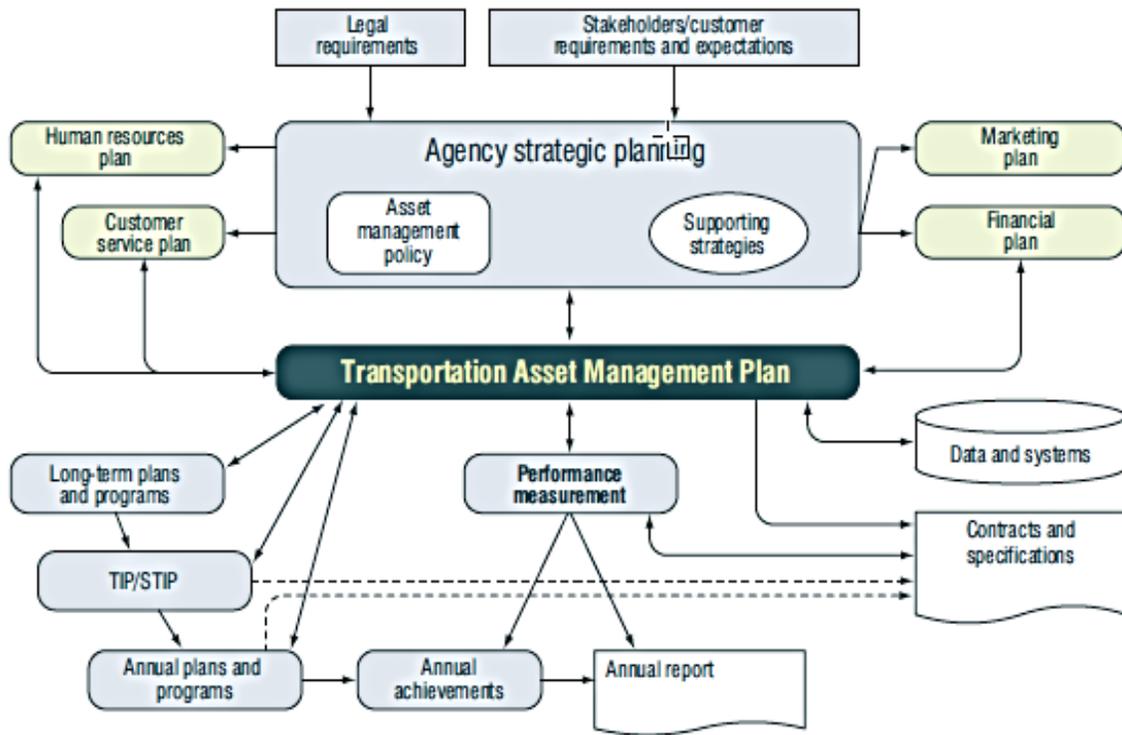
Figure 5: Transportation Asset Management Plans connect to all other documents and strategic planning efforts at the State level.

Prioritizing Expenditures

With the final TAMP in place, State DOTs can use the asset management process to make cost-effective resource allocation decisions for maintenance, construction, and reconstruction projects. Although each State will establish a different asset management process, all states can use the TAMP to find an efficient balance of expenditure between maintenance and mobility. In an era of competing objectives, asset management allows states to make the most of limited resources.

> *Best Practice Example:* LA DOTD is using its new asset management process to consider asset lifecycle costs and take a more proactive approach to maintenance decisions. The agency has incorporated performance measures into its project selection manuals. These performance measures will enable LA DOTD to evaluate the effectiveness of funding decisions and to make future improvements to the TAMP itself.

G. Communicating and Coordinating with Stakeholders and the Public

By sharing the TAMP with legislators and the general public, State DOTs can use asset management to inspire confidence in project selection and demonstrate objective, data-driven decisionmaking to the stakeholders at all levels.

Justifying Maintenance Expenditures

Transportation Asset Management Plans are valuable resources for communicating the rationale behind funding decisions and project selection, both to legislatures and to the general public. Although maintenance programs may receive less attention and support than new construction projects, effective asset management allows State DOTs to demonstrate that adequate maintenance funding levels are necessary to support an appropriate level of service on a State's roadways.

Communicating with the Public

One challenging aspect of advertising the TAMP is explaining the technical nature of the asset management process to individuals without engineering backgrounds. To address this challenge, the TAMP must be written in plain language and should include creative communication strategies.

> *Best Practice Example:* LA DOTD plans to conduct workshops for legislators and other individuals to explain the agency's use of the TAMP to set funding policy and make allocation decisions. The agency is also experimenting with the use of social media in its public involvement process.

Action Planning and Next Steps

During the final stage of the exchange, the peer DOTs and SCDOT staff worked with the facilitator to summarize their next steps to develop formal asset management plans, implement asset management plans at their respective agencies, and make use of the information shared during the exchange. The result was an agreed-upon set of next steps for each agency. These include:

- SCDOT staff will hold a post-peer exchange debrief to identify next steps and discuss needs for the development of South Carolina's TAMP.
- All attendees will consider attending the National Conference on Transportation Asset Management in April 2014.
- SCDOT staff will form a TAMP steering committee to guide the development of the formal TAMP. The steering committee will determine who from SCDOT should attend the upcoming Asset Management Conference and whether SCDOT should hire a consultant for the development of the TAMP.
- SCDOT staff will also review LA DOTD's request for proposals (RFP) for its asset management system to identify specific ideas and terminology that may be useful for SCDOT's acquisition of a new asset management system.
- Staff from NCDOT and SCDOT will arrange to meet in Charlotte, NC and review NCDOT's use of its commercially available asset management system.
- To begin the process of implementing a risk management program, SCDOT staff will review MnDOT's risk plan to draw upon the MnDOT's experience in defining agency-specific categories for risk, drafting mitigation strategies for risk, and funding options for mitigating risk. SCDOT staff will be mindful of the importance of drawing upon a diverse group of staff in the development of the risk management process.
- At a high level, SCDOT plans to use the development of the TAMP to promote a risk-based approach to the strategic planning process more generally. In a similar vein, SCDOT staff plan to use the TAMP to advance asset management principles throughout the organization and emphasize the importance of maintenance and preservation.

About the Transportation Planning Capacity Building (TPCB) Program

The Transportation Planning Capacity Building (TPCB) Program is a joint venture of the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) that delivers products and services to provide information, training, and technical assistance to the transportation professionals responsible for planning for the capital, operating, and maintenance needs of our nation's surface transportation system. The TPCB Program website (www.planning.dot.gov) serves as a one-stop clearinghouse for state-of-the-practice transportation planning information and resources. This includes over 70 peer exchange reports covering a wide range of transportation planning topics.

The TPCB Peer Program advances the state of the practice in multimodal transportation planning nationwide by organizing, facilitating, and documenting peer events to share noteworthy practices among State DOTs, Metropolitan Planning Organizations (MPOs), transit agencies, and local and Tribal transportation planning agencies. During peer events, transportation planning staff interact with one another to share information, accomplishments, and lessons learned from the field and help one another overcome shared transportation planning challenges.

Appendices

A. Key Contacts

Kirby Becker
Planning Director
Office of Transportation System Management
Minnesota Department of Transportation
395 John Ireland Blvd.,
St. Paul, MN 55155
(651) 366-3740
kirby.becker@state.mn.us
http://www.dot.state.mn.us/

Jennifer Brandenburg
State Asset Manager
North Carolina Department of Transportation
4809 Beryl Road
Raleigh, NC 27606
(919) 733-3725
jbrandenburg@ncdot.gov
http://www.ncdot.gov/

Michael Bridges
Undersecretary, Office of Management &
Finance
Louisiana Department of Transportation and
Development
1201 Capitol Access Road
Baton Rouge, LA 70804
(225) 379-1270
Michael.Bridges@LA.GOV
http://www.dotd.la.gov/home.aspx

Jessica Hekter
Community Planner
FHWA South Carolina Division Office
1835 Assembly Street, Suite 1270
Columbia, SC 29202
803-765-5458
jessica.hekter@dot.gov
http://www.fhwa.dot.gov/scdiv/

Mark Lester
Community Planner
South Carolina Department of Transportation
955 Park Street
Columbia, SC 29202
(803) 737-1444
lestermc@scdot.gov
http://www.dot.state.sc.us/

Terry Regan
Community Planner
Volpe National Transportation Systems
Center/U.S. DOT
55 Broadway
Cambridge, MA 02142
(617) 494-3628
terry.regan@dot.gov
www.volpe.dot.gov

Egan Smith
Community Planner
FHWA Office of Planning
1200 New Jersey Avenue, SE
Washington, DC 20590
(202) 366-6072
egan.smith@dot.gov
www.planning.dot.gov

B. Event Participants

Name	Agency
Todd Anderson	South Carolina Department of Transportation
William Beatty	FHWA North Carolina Division Office
Kirby Becker	Minnesota Department of Transportation
Jennifer Brandenburg	North Carolina Department of Transportation
Michael Bridges	Louisiana Department of Transportation and Development
Brandon Buckner	FHWA Louisiana Division Office
David Cook	South Carolina Department of Transportation
Unwanna Dabney	FHWA North Carolina Division Office
Robert Dickinson	South Carolina Department of Transportation
Jim Feda	South Carolina Department of Transportation
Doug Frate	South Carolina Department of Transportation
Jim Garling	FHWA South Carolina Division Office
Rickele Gennie	FHWA South Carolina Division Office
Jessica Hekter	FHWA South Carolina Division Office
Mark Lester	South Carolina Department of Transportation
Scott Ludlam	South Carolina Department of Transportation
Rob Manning	South Carolina Department of Transportation
Scott Middleton	Volpe National Transportation Systems Center/U.S. DOT
Yolanda Morris	FHWA South Carolina Division Office
Terry Regan	Volpe National Transportation Systems Center/U.S. DOT
Walter Reed	South Carolina Department of Transportation
Tony Sheppard	South Carolina Department of Transportation
Egan Smith	FHWA Office of Planning
Jose Valdivieso	South Carolina Department of Transportation
Jim Warren	South Carolina Department of Transportation
Clifton White	South Carolina Department of Transportation

Developing Formal Asset Management Plans
Peer Exchange: South Carolina Department of Transportation
Columbia, South Carolina

Dates: Wednesday-Thursday, February 5-6, 2014

Host Agency: South Carolina Department of Transportation (SCDOT)
Facilitator: Terry Regan, Volpe Center
Peers:
Kirby Becker, Planning Director, Minnesota Department of Transportation
Jennifer Brandenburg, State Road Maintenance Engineer, NCDOT
Michael Bridges, Undersecretary, Louisiana Department of Transportation and Development

Format:
- Brief presentations by peer DOTs
- Informal facilitated discussion among all participants

Day 1: February 5th at SCDOT

Time	Topic	Lead Presenter
12:00 p.m.	**Welcome and Overview** FTA and FHWA staff welcome attendees, review the agenda, describe documentation/follow-up, and establish ground rules for discussions.	
12:15 p.m.	**SCDOT Welcome and Goals** SCDOT welcomes participants and opens the exchange. Provides context on what motivated the peer exchange request and South Carolina's goals for the day. Explains background of SCDOT's asset management efforts.	Host
12:30 p.m.	**Setting the context: key concepts in asset management**	Terry Regan
12:45 p.m.	**Session 1: Existing Inventory and Asset Management Systems** *A summary of the inventory and asset management systems in place in each peer state.* - Louisiana - Minnesota - North Carolina **Comments and Discussion**	Peers All
2:45 p.m.	*Break*	
3:00 p.m.	**Session 2: Asset Management Data Needs** - Data necessary for asset management - Setting data governance/management policies - Data gathering - Data interoperability and consistency - Dealing with data deficiencies **Comments and Discussion**	Peers All
5:00 p.m.	**Wrap up Day 1 and prepare for Day 2**	Facilitator

Day 2: February 6th at SCDOT

8:00 a.m.	**Session 3: Planning for an Asset Management System** • Advantages and disadvantages of specific asset management systems (e.g. AgileAssets) • Unifying multiple asset management systems • Determining appropriate resource allocation between preservation and mobility • Making the most of limited resources *Compliance with State and Federal Planning Requirements* • Asset management and MAP-21 • Connection to financial planning, as required by MAP-21 • Relationship between asset management plans and other plans • Other State/Federal requirements **Comments and Discussion**	Peers All
9:15 a.m.	*Break*	
9:30 a.m.	**Session 4: Implementing a Formal Asset Management Plan** • Organizational structure required to support asset management functions – *Who should be at the table?* • Resources required to do asset management effectively • Preparing a plan in-house vs. with a consultant **Comments and Discussion**	Peers All
11:00 a.m.	**Small Group Discussion / Action Planning** • Final best practices and lessons learned • Open roundtable discussion/Q&A • Action planning • Report out	All
12:00 p.m.	**Conclusion**	Facilitator
12:15 p.m.	**Wrap up**	**Facilitator**

D. Additional Resources

AgileAssets *Success Stories*: "North Carolina DOT Optimizes Budgets and Integrates Asset Management Practices with AgileAssets' Software Solutions."
http://www.agileassets.com/ncdot_chooses_agileassets/

AASHTO: Transportation Asset Management Guide: A Focus on Implementation
http://www.fhwa.dot.gov/asset/pubs/hif13047.pdf

FHWA: Asset Management Homepage
http://www.fhwa.dot.gov/asset/

FHWA MAP-21 Asset Management Questions & Answers
https://www.fhwa.dot.gov/map21/qandas/qaassetmgmt.cfm

FHWA: Transportation Asset Management Plan Pilot Program Webpage
Transportation Asset Management Plan Pilot Program

FHWA: Strategic Framework to Support the Implementation of Transportation Asset Management in State Transportation Agencies, Transportation Asset Management Expert Task Group
http://www.fhwa.dot.gov/asset/pubs/framewok.pdf

LA DOTD Work Plan for Developing a Transportation Asset Management Tool
http://www.fhwa.dot.gov/asset/tamp/la_tamp.pdf

MnDOT Work Plan for Developing a Transportation Asset Management Tool
http://www.fhwa.dot.gov/asset/tamp/mn_tamp.pdf

NCHRP 08-90: Transportation Asset Management Gap Analysis Tool
http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3397

NHI Asset Management Training Webpage
http://www.fhwa.dot.gov/asset/training.cfm

TPCB Homepage
http://www.planning.dot.gov/

TRB Committee on Transportation Asset Management (ABC 40)
https://sites.google.com/site/trbcommitteeabc40/

TRB's 10th National Conference on Transportation Asset Management
http://www.trb.org/Calendar/Blurbs/167632.aspx

USDOT MAP-21 Homepage
http://www.dot.gov/map21

E. Acronyms

AASHTO	American Association of State Highway and Transportation Officials
BRIM	Bridge Replacement and Improvement Management
COTS	Commercial Off-the-Shelf
DOT	Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GIS	Geographic Information Systems
HPMA	Highway Pavement Management Application
HPMS	Highway Performance Management System
LA DOTD	Louisiana Department of Transportation and Development
LRTP	Long-Range Transportation Plan
MAP-21	Moving Ahead for Progress in the 21st Century
MnDOT	Minnesota Department of Transportation
MPO	Metropolitan Planning Organization
NCDOT	North Carolina Department of Transportation
NHI	National Highway Institute
NHS	National Highway System
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Act: A Legacy for Users
SCDOT	South Carolina Department of Transportation
STIP	Statewide Transportation Improvement Program
TAMP	Transportation Asset Management Plan
TIP	Transportation Improvement Program
TPCB	Transportation Planning Capacity Building
USDOT	U.S. Department of Transportation