

Transportation Asset
Management:
Ready or Not,
Here Comes The New Paradigm

or

The Long Slow Road to Change

Asset Management Defined

“...a comprehensive and structured approach to the long-term management of assets as tools for the efficient and effective delivery of community benefits.”

Strategy for Improving Asset Management Practice, **AUSTROADS**
1997

Asset Management Defined

“...a methodology needed by those who are responsible for efficiently allocation generally insufficient funds amongst valid and competing needs.”

The **American** Public Works Association Asset Management Task Force,
1998

Asset Management Defined

“Asset Management...goes beyond the traditional management practice of examining singular systems within the road networks, i.e., pavements, bridges, etc., and looks at the universal system of a network of roads and all of its components to allow comprehensive management of limited resources. Through proper asset management, governments can improve program and infrastructure quality, increase information accessibility and use, enhance and sharpen decision-making, make more effective investments and decrease overall costs, including the social and economic impacts of road crashes .”

Organization for **European** Cooperation and Development Working Group,
Asset Management Systems, Project Description, **1999**

Asset Management in US

- FHWA Office of Asset Management Created 1998
- Asset Management Primer - December 1999
 - A Business Process
 - A Decision Making Framework
 - Covers An Extended Time Horizon
 - Draws from Economics as well as Engineering
 - Considers A Broad Range of Assets
- MAP-21, the Moving Ahead for Progress in the 21st Century Act - July 2012

Why Asset Management

- Transportation Agencies had Outstanding Historical Record of Effective Asset Management
 1. Changes in Transportation Environment
 - High User Demand
 - Budgets Stretched by Requirements
 - Declines in Staff Resources
 - Mature Assets w/ Ongoing Deterioration

Why Asset Management

- Transportation Agencies had Outstanding Historical Record of Effective Asset Management
2. Changes in Public Expectations
 - Investment of Public Tax Dollars
 - More Communication Opportunities
 - Public Holds Agencies Accountable
 - Requires Explicit & Clearly Defined Goals

Why Asset Management

- Transportation Agencies had Outstanding Historical Record of Effective Asset Management
3. Extraordinary Advance in Technology
- More Sophisticated Analytical Tools
 - Technology to Support Comprehensive, Fully Integrated Systems
 - Ability to Perform What-If Analysis
 - Impact of Various Budget Levels on System Condition & Performance

Asset Management Approach

- Provides Information for Cost Effective Decisions
- Economic Assessment of Trade-Offs Between Alternate Investment Options
 - Project Level
 - Program or Network Level

Asset Management Guiding Principles

- Customer Focused
- Mission Driven
- System Oriented
- Long-Term Outlook
- Accessible & User Friendly
- Flexible

Five Basic Principles

Asset management provides agencies with a systematic approach to managing transportation agencies that improves agency transparency and accountability. It is based on the following five basic principles:

1. **Policy-driven:** Decisions reflect policy goals and objectives that define desired system performance levels.
2. **Performance-based:** Performance information is used to establish target levels, to allocate funding, and to monitor progress.
3. **Evaluates options:** Comprehensive choices and tradeoffs are examined at each level of decision-making.
4. **Data driven:** Management systems and tools that utilize quality data are used to support decisions.
5. **Transparent:** There are clear criteria for making decisions.

Supporting Core TAM Requirements

Five key components are required for any comprehensive Transportation Asset Management system:

1. An asset inventory
2. Methods of assessing current conditions and/or performance
3. A process to determine and evaluate future system needs
4. Tools to evaluate and select appropriate strategies to address current and future needs
5. Methods to evaluate the effectiveness of each strategy⁽¹⁴⁾

Implementation Challenges

Table 2. Challenges to AM development and implementation (from NCHRP Synthesis 439).

Challenges	Responses*	Percent
Lack of resources (e.g., funding, equipment)	35	81 %
Lack of staff	29	67 %
Resistance to change	26	60 %
Inter-departmental interactions	25	58 %
Higher and other priorities	22	51 %
Lack of expertise and training	22	51 %
Staff commitment	18	42 %
Executive commitment	14	33 %
Staff turnover	11	26 %
Availability of adequate tools in the marketplace	9	21 %
Outside pressure to have a subjective approach	8	19 %
Lack of guidance and support	2	5 %

*43 agencies responded, but multiple answers were allowed.

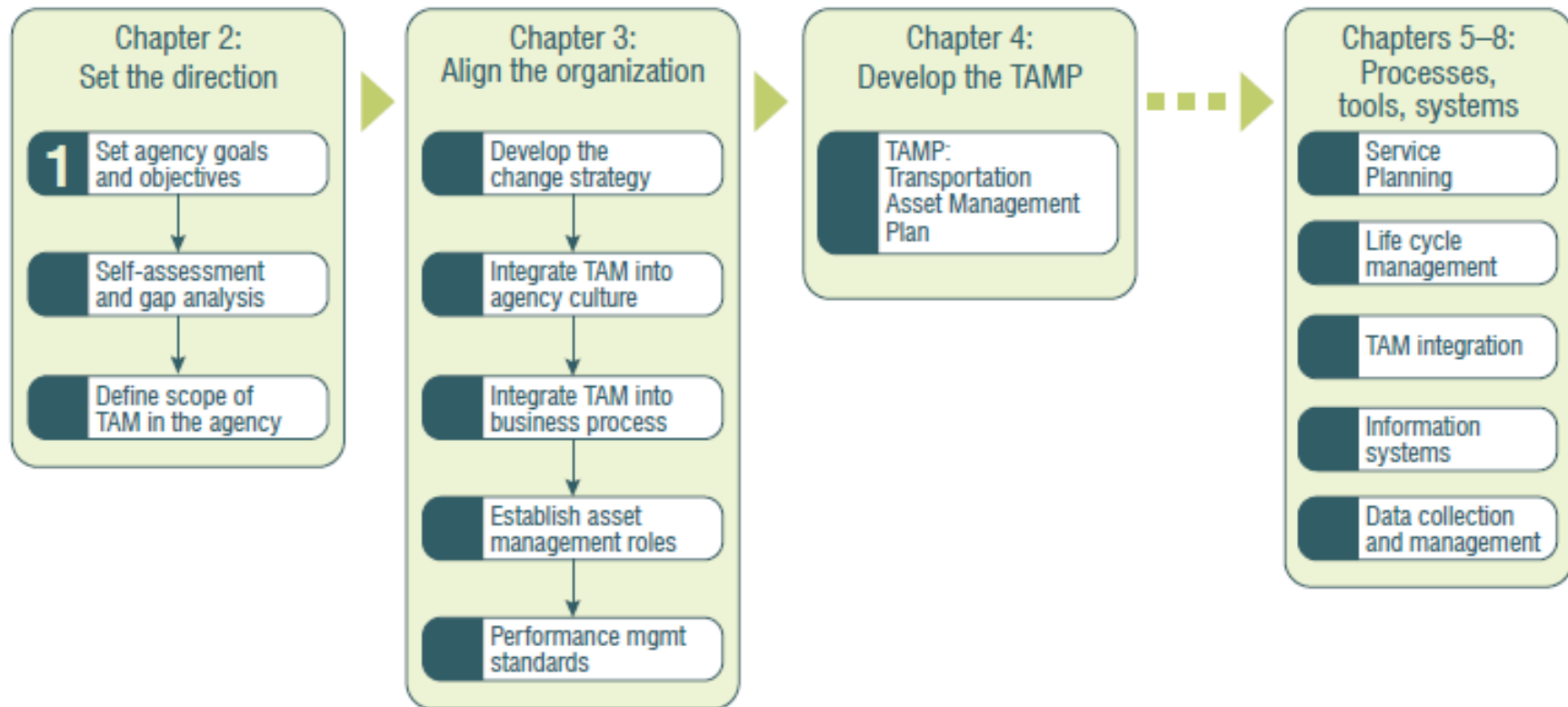


Figure 1. TAM Implementation Steps

Transportation Asset Management Plan

TAMP - A TAMP is an essential management tool that brings together all related business processes and stakeholders, internal and external, to achieve a common understanding and commitment to improved performance. It is a tactical-level document, which focuses its analysis, options development, programs, delivery mechanisms, and reporting mechanisms on ensuring that strategic objectives are achieved.²

Maturity Scale	Processes	Frequency	Sub-element Emphasis	Process Formality	Data & Technology	Outputs & Results	0%	Initial
Level 1 - Initial	Initial stages of inquiry; focus is on literature search and peer reviews/calls	Occasionally do this	Receives minimal emphasis; some efforts underway	Done informally only; ad hoc procedures; minimal documentation; no organizational integration	Manual system exists; plans for automated system in place	Minimal results; long way to go	10%	Initial
							20%	Initial
							30%	Awakening
Level 2 - Awakening	Identify nature/extent of capital assets; prompted by new financial reporting	Sometimes done on an as-needed basis for critical programs and activities	Moderately emphasized; try to adhere to this	Semiformal process; some routine procedures exist; limited organizational integration	Automated system exists; meets basic needs	Some results; still below expectations	40%	Awakening
							50%	Structured
Level 3 - Structured	Processes identify, assess, and value infrastructural assets; focus on preservation and replacement / rehabilitation	Often do this on many programs and activities	Generally emphasized; something that is done and checked	Formal process exists; modestly documented; good but still evolving; some organizational integration	Good system in place; widely available; meets all key user needs	Good results getting there	60%	Structured
							70%	Proficient
Level 4 - Proficient	Processes extend to life-cycle development and preservation	Usually do this; omitted only in exceptional circumstances	Strongly emphasized; used to measure and reward by	Formal documented process; well-tested and well followed; considerable organizational integration	Strong system in place; fully integrated; meets nearly all user needs	Excellent results; still some room to improve	80%	Proficient
							90%	Best practice
Level 5 - Best practice	Fully integrated processes; across all functions; flexible to change	Always do this; standard operating procedure	Heavily emphasized; one of the principles by which business is done	Mastery of formal processes; well-documented; standardized; full organizational integration	State-of-the-art system in place; always seeking betterment	Unparalleled results; fully engaged organization; a total success	100%	Best practice

Gaps (Issues)

Using the results of the synthesis as a base, the TAM ETG identified a variety of factors that limit the ability of state highway agencies to fully utilize asset management. These gaps, which are listed below, range from the availability and capacity of agency employees to the availability of the processes and tools to support an asset management analysis.

- **Agency resources:** The availability of agency resources to support asset management activities is limited and many agencies are not filling vacancies that are created.
- **Agency awareness, knowledge, and understanding:** Asset management represents a new way of doing business, which requires new skills and changes to the types of individuals being hired in transportation agencies.
- **Public understanding:** The common approaches to communicate funding needs have not addressed funding needs in transportation. Additionally, the long-term consequences of deferring asset preservation activities are either not understood or are being ignored.
- **Stewardship:** More elected officials and agency executives need to be made aware of their role as stewards of transportation assets. As a result, they do not place a priority on preserving the value of these assets over time.
- **Organizational culture:** Since these agencies were created, state and federal transportation agencies have primarily focused on expanding and rehabilitating the highway system. Today's economic climate demands that transportation agencies change the organizational culture to support the new way of doing business. These changes involve transitioning from a culture focused on system expansion to system preservation and placing more of an emphasis on system optimization over project optimization.
- **Leadership support and commitment:** Asset management demands the support and commitment of agency leadership in setting policies and investment priorities. Executive support is also instrumental in facilitating the business process and other organizational changes needed to build an organizational culture that supports performance-based decisions.

- **Funding structure:** Historically, transportation funding has been allocated into a number of different formula programs, each of which has their own requirements for using funds. MAP-21 places more of an emphasis on managing to performance outcomes that are documented in the TAMP. MAP-21 also consolidates the funding for some programs, but the remaining programs can influence the amount of flexibility that state highway agencies have in making asset management investments. Changes in existing federal and state policies may also be needed to support investments that optimize system performance rather than focus on optimizing project performance.
- **Data and Systems:** In the past, agency personnel collected the data they needed to make investment decisions independent of other uses for the data. Efforts to improve agency efficiency are forcing transportation agencies to coordinate data collection efforts and to strive for consistent data standards so data can be integrated on an agency-wide basis. Advances in technology have significantly improved data coordination and integration efforts. However, some of the existing technology is under-utilized. In other instances, analysis tools have not yet been developed to provide some of the capabilities desired in using and analyzing available data.
- **Risk Management:** MAP-21 requires the consideration of risk in developing an asset management plan. Although most transportation agencies have accounted for risks on individual projects, the systematic consideration of agency and program risks is a new concept that is not well understood. Among agencies that have considered risk, there is no consistent approach being used. Therefore, guidance is needed on how to better incorporate and use risk in making investment decisions.
- **Long-Term Financial Planning:** Internationally, transportation agencies have developed metrics leading to sustainable transportation systems through a focus on long-term financial plans that balance the trade-offs between anticipated revenue and the funding needed to achieve performance targets. These concepts are not widely understood or utilized within the United States.

Short-Term and Long-Term Strategies to Address Gaps Identified by the TAM ETG

1. Focus short-term strategies on addressing the related to agency resources and leadership.
 - a. Build and strengthen leadership support for asset management programs that consider risk and that reduce the overall life-cycle cost of managing assets.
 - b. Improve the awareness, understanding, and knowledge of asset management at all levels of the organization.
 - c. Assist organizations with the cultural, organization, and institutional changes that are needed to advance the use of asset management.
 - d. Provide technical guidance and support in asset management so existing tools and data can be used fully and MAP-21 requirements can be met.
 - e. Encourage the use of asset management beyond the requirements outlined in MAP-21.
2. Focus long-term strategies on advancing asset management maturity levels and building external support for asset management.
 - a. Support the development of enhanced procedures and analysis tools that support cross-asset optimization, data integration, risk management, and long-term financial planning.
 - b. Demonstrate the influence of asset management on improvements in agency transparency, accountability, and stewardship.
 - c. Align national and state policies and standards with approaches that support the optimization of system performance.

Table 3. Contributing factors influencing each gap area.

Gaps	Organizational Capacity	External Stakeholder Influence	Availability of Processes and Tools	Financial Management
Resources: Agency Resources	<ul style="list-style-type: none"> Staff shortages exist due to retirements and decisions not to fill vacancies The organizational structure does not easily accommodate cross-cutting activities Agency knowledge is retiring faster than it is built 	<ul style="list-style-type: none"> There is external pressure to reduce the size of government agencies 	<ul style="list-style-type: none"> Resources are not always available to maintain data and systems over time The benefits associated with improved data cannot easily be documented and conveyed to decision makers 	<ul style="list-style-type: none"> Work activities are contracted out due to staff shortages
Resources: Agency Awareness, Knowledge, and Understanding	<ul style="list-style-type: none"> Asset management is not part of a traditional engineering curriculum DOTs have not typically hired business majors Existing workloads limit the time available to acquire new skills 	<ul style="list-style-type: none"> Reasons for using asset management are not well known or understood beyond what is legislated 	<ul style="list-style-type: none"> Staff are not always aware of available tools and products Staff do not have the knowledge or experience to know what questions to ask or to evaluate the suitability of available tools and products 	<ul style="list-style-type: none"> Fiscal constraints are forcing agencies to be more efficient with available resources
Resources: Public Understanding	<ul style="list-style-type: none"> Benefits to improved asset management are primarily subjective rather than objective Agencies rely on traditional methods of conveying needs, which have not been effective at driving change 	<ul style="list-style-type: none"> The benefits of asset management are not well understood outside of the transportation community Consequences of deferring preservation activities are not well known Traditional measures of performance have not motivated decision makers in the past 	<ul style="list-style-type: none"> It is difficult to quantify the benefits associated with improved decisions or better data 	<ul style="list-style-type: none"> Long-term consequences of limited investments in transportation are not well understood or are not convincing
Leadership: Stewardship	<ul style="list-style-type: none"> Methods of conveying investment needs that lead to fiscally sustainable programs are not well understood There is little guidance available to help agencies strengthen their roles as system stewards 	<ul style="list-style-type: none"> Elected and appointed officials have not embraced their role as stewards of the transportation system MAP-21 requirements will lead to improved transparency and accountability 	<ul style="list-style-type: none"> Mandates for compliance with standards such as safety and handicap access are often based on highway project location instead of locations of greatest benefit 	<ul style="list-style-type: none"> Financial managers have not traditionally been involved in asset management activities
Leadership: Organizational Culture	<ul style="list-style-type: none"> Most agencies have a short-term rather than long-term focus Efforts of individual champions may start an initiative, but are not sufficient to sustain the initiative over time Asset management is cross-cutting and does not easily fit within existing organizational structures 	<p>Agency leadership changes after elections can have a significant impact on programs that are not fully integrated into business processes</p> <p>In the absence of strong stewards among elected officials, there is little incentive from external stakeholders to use asset management</p>	<ul style="list-style-type: none"> Some guidance is available to identify improvement areas through the self-assessment and gap analysis tools 	<ul style="list-style-type: none"> There are few known financial incentives to motivate agency change
Leadership: Leadership Support and Commitment	<ul style="list-style-type: none"> It is difficult to make the changes needed for asset management without leadership support Historically, legislated requirements have not had the "teeth" necessary to motivate organizational change 	<ul style="list-style-type: none"> Priorities of elected and appointed officials often work against asset management programs Many transportation agency directors serve at the pleasure of elected officials, which makes it difficult to enforce changes to existing investment processes 	<ul style="list-style-type: none"> There is a lack of executive-level metrics that communicate the need for, and the benefits of, preservation activities 	<ul style="list-style-type: none"> Transportation agencies facing constrained budgets are seeking ways of making more cost-effective investment decisions

Table 3. Contributing factors influencing each gap area (continued).

Gaps	Organizational Capacity	External Stakeholder Influence	Availability of Processes and Tools	Financial Management
<p>Planning and Programming:</p> <p>Funding Structure</p>	<ul style="list-style-type: none"> • Dedicated funding sources lead to management of assets individually rather than as a system • Traditional organizational structures do not easily lend themselves to cross-asset analysis • Historically, there has been no accountability for reaching agency goals within planning and programming functions 	<ul style="list-style-type: none"> • Transportation agencies have not traditionally been held accountable for stated performance objectives • Unexpected events tend to divert funding away from sound, long-term goals 	<ul style="list-style-type: none"> • The statewide transportation improvement program is managed on a project-by-project basis rather than a system optimization basis 	<ul style="list-style-type: none"> • Dedicated funding sources prevent true optimization of investments • Future funding levels are extremely variable, making it difficult to conduct long-term planning
<p>Data and Analysis:</p> <p>Data and Systems</p>	<ul style="list-style-type: none"> • Leaders do not understand the value of improved data • Data governance issues have not been addressed to identify data sources, uses, and standards • Some people are hesitant to move forward without adequate data; yet obtaining adequate data can take years • Agency staff do not have the skills to be able to fully utilize existing management systems • Managing the system requires coordination with outside agencies, such as MPOs 	<ul style="list-style-type: none"> • Elected officials and outside stakeholders seek improved methods of visualizing and communicating technical information 	<ul style="list-style-type: none"> • Improved tools are needed to manage systems and to perform cross-asset utilization • Tools to predict the performance of assets other than pavements are not widely available • Many agencies have limited inventory and performance data on roadside assets, with the exception of pavements and bridges 	<ul style="list-style-type: none"> • The lack of confidence in prediction models beyond 5 years makes long-term planning difficult
<p>Data and Analysis:</p> <p>Risk Management</p>	<ul style="list-style-type: none"> • The structured analysis of agency and program risks is not well understood or practiced • Guidance on conducting a formal assessment of agency risks is not available • Legislation provides a basis for a consistent approach to be followed for analyzing and managing risk 	<ul style="list-style-type: none"> • Demand for an agency-wide assessment of risks has been absent • Unexpected events tend to shift funding away from sound, long-term goals 	<ul style="list-style-type: none"> • There are not widely-available tools for conducting a formal risk assessment of agency and program risks 	<ul style="list-style-type: none"> • Guidance for incorporating risk into long-term financial plans is not readily available
<p>Data and Analysis:</p> <p>Long-Term Financial Planning</p>	<ul style="list-style-type: none"> • Organizational changes are needed to focus on long-term, sustainable investments in the infrastructure • Concepts of long-term financial sustainability are not well understood in the United States • Future funding is difficult to predict, making it hard to confidently plan into the future 	<ul style="list-style-type: none"> • Political influence on program decisions can negatively influence an agency's ability to optimize expenditures and achieve goals • In the United States, elected officials have not demonstrated an affinity for being held to long-term financial commitments • There are no consequences for poor stewardship 	<ul style="list-style-type: none"> • Guidance in developing long-term, sustainable programs is not currently available • Existing systems may need increased sophistication to produce the information necessary for developing long-term, sustainable programs 	<ul style="list-style-type: none"> • The links between the long-term financial plan and other operational plans is not well established

Table 4. Focus areas over the next 10 years.

	Within the Next Two Years	Within the Next Five Years	Within the Next Ten Years
Focus Areas	<ul style="list-style-type: none"> • Implementation of MAP-21 	<ul style="list-style-type: none"> • Expanded coverage of assets included in a TAMP • Guidance on: Data Governance & Integration, Long-Term Financial Planning, Risk, System Optimization, Maturity Assessments • Level 3 Performance Measures 	<ul style="list-style-type: none"> • Expanded focus on Long-Term Financial Planning • Core maturity levels met in most states • Establish objective audit mechanism to ensure compliance with TAMP
Awareness Building Topics to Address to Achieve Desired Capabilities	<ul style="list-style-type: none"> • Asset Management • Developing a TAMP • MAP-21 Requirements • Communication Strategies • Risk Management • Data Integration 	<ul style="list-style-type: none"> • Long-Term Financial Plans • Maturity Assessments • System Optimization • Advanced Communication Strategies 	<ul style="list-style-type: none"> • TAMP Audit Mechanisms • Public support for asset management
Capacity Building Topics to Address to Achieve Desired Capabilities	<ul style="list-style-type: none"> • Developing a TAMP • Evaluating State TAMP Processes (FHWA Division Offices) • Aligning TAMP with agency long-range plans and processes 	<ul style="list-style-type: none"> • CEO Stewardship Roles • Enterprise Risk Management • Data Governance and Integration using GIS • Maturity Assessments • System (e.g. Cross Asset) Optimization 	<ul style="list-style-type: none"> • Long-Term Financial Planning • TAMP Audit Procedures • Level of Service Planning
Development of Guidance, Tools, and Templates to Achieve Desired Capabilities	<ul style="list-style-type: none"> • Data Collection and Management of Roadway Assets Other than Pavements and Bridges • TAMP Templates • Maturity Assessment Tools • Knowledge Portal 	<ul style="list-style-type: none"> • Risk Management Guidelines • System Optimization Tools and Strategies • Data Governance Guidelines • New and Enhanced Performance Measures 	<ul style="list-style-type: none"> • Financial Management Templates and Tools

Transportation Asset Management Business Process	Potential Benefits of Data Integration
Asset Inventory	<ul style="list-style-type: none"> • Acquire and upload data from a single source just once. • Update and process inventory records in a single transaction. • Determine more easily how much data exists and how much needs to be collected. • Reduce data handling and processing time with built-in data checking and verification.
Assessing Current Conditions and Performance	<ul style="list-style-type: none"> • Analyze historical and spatial conditions more conveniently. • Quickly identify assets that need immediate attention. • Standardize condition rating procedures and establish more uniform criteria for evaluation. • Store condition/investment analysis data and results more conveniently. • Support collective decisionmaking across various skills sets within an agency.
Determining and Evaluating Future System Needs	<ul style="list-style-type: none"> • Facilitate integrated decisionmaking. • Support investment trade-off analysis (across asset categories and modes). • Allow for more thorough and detailed assessment of investment requirements and help minimize the risk of flawed funding projections. • Effectively determine future funding needs. • Support the development of comprehensive improvement programs that cover multiple assets. • Enhance communication and improve the overall alignment of investment programs.
Evaluating and Selecting Strategies for Current and Future Needs	<ul style="list-style-type: none"> • Develop more effective management strategies by combining data about previous activities or decisions with existing condition data. • Reduce the risk of choosing inappropriate or ineffective action. • Prevent the inadvertent development of multiple strategies for a single asset. • Evaluate the economic viability of various alternatives. • Readily store and retrieve results of analyses. • Support fact-based strategies.
Evaluating the Effectiveness of Each Strategy	<ul style="list-style-type: none"> • Improve performance through immediate feedback. • Calculate performance measures and indicators with a higher level of confidence. • Promote more consistent performance measures agency-wide. • Calculate and evaluate multiple performance measures for many assets in less time. • Conduct different types of analysis with data more flexibly. • Quickly compare assets, resources, personnel and activities.

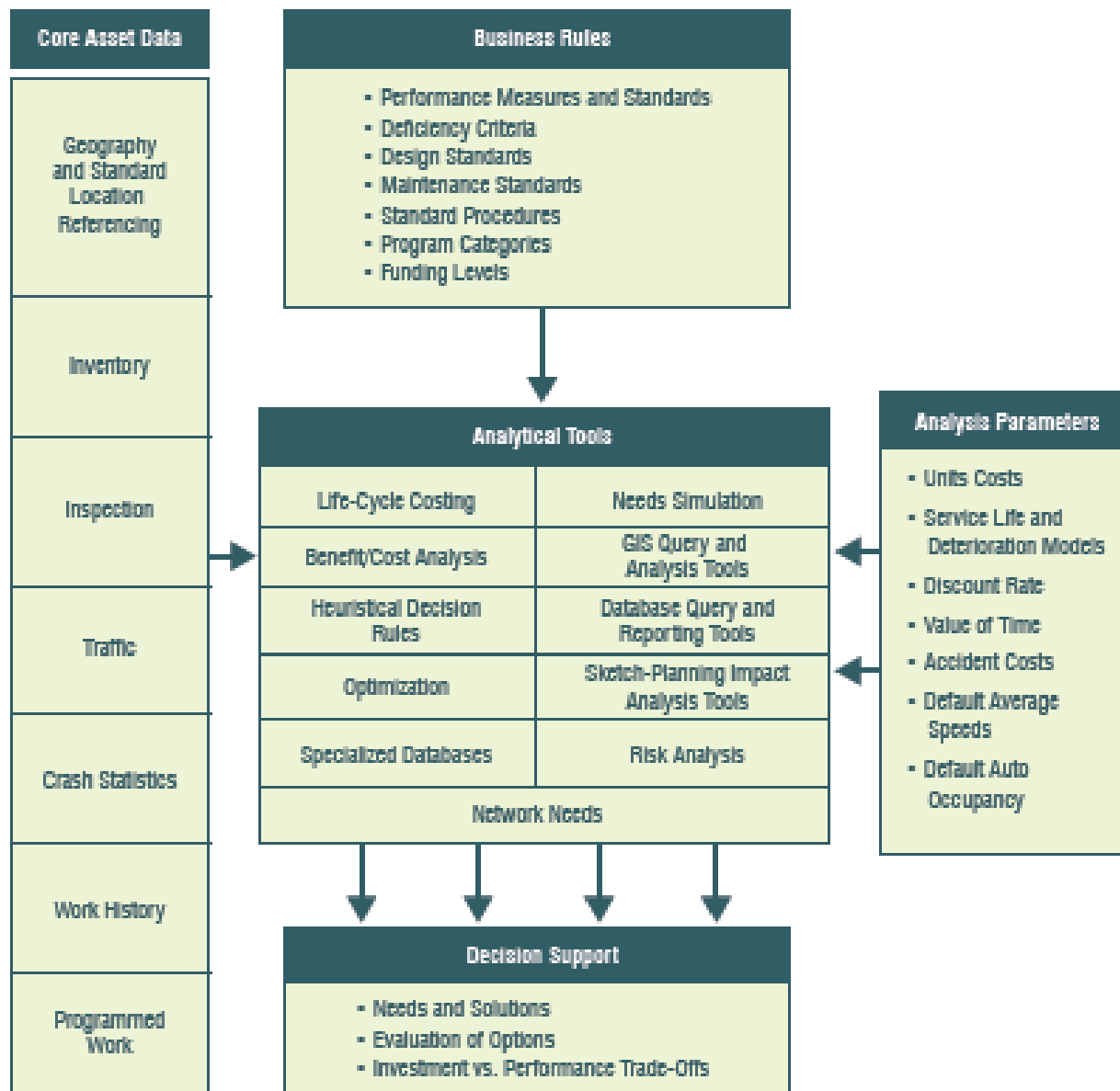


Figure 14. Context for Analytical Toolbox

Other Benefits

Additional benefits driving the adoption of data integration practices among transportation agencies are similarly compelling and numerous:

- **Availability/Accessibility**-Asset data that is easily retrieved, viewed, queried, and analyzed by anyone within an agency encourages the integration of such data into every area of an agency that can benefit from it, spurring both innovation and better decision-making.
- **Timeliness**-Well-organized data can be quickly updated; one input will often apply the data across a variety of linked systems, and the information can be time-stamped to reflect its currency.
- **Accuracy and Integrity**-Errors are greatly reduced because the integration environment drives a higher quality of input and can include automatic or convenient errorchecking and verification.
- **Consistency and Clarity**-Integration requires clear and unique definition of various types of data, avoiding confusion or conflict in the meaning of terms and usage.
- **Completeness**-All available information, including both historical and recent data, is accessible in an integrated database, with any missing records or fields identified and flagged via the integration process.
- **Reduced Duplication**-Identical data is eliminated reducing the need for multiple updates and ensuring everyone is working from the exact same information.
- **Faster Processing and Turnaround Time**-Less time is spent on consolidating and transmitting data to various users in the agency. The integrated data environment saves time by eliminating consolidation and transmittal to disparate users and allows many users to conduct separate analyses concurrently.
- **Lower Data Acquisition and Storage Cost**-Data are collected or processed only once, and the information is consolidated and stored at locations supporting optimal convenience and ease of maintenance.
- **Informed and Defensible Decisions**-Highly organized, comprehensive databases allow users to drill down through successive levels of detail for an asset, supplying more information to support decisions and supporting different types of analysis using various data combinations.
- **Enhanced Program Development**-Comprehensive and coordinated system information advances program development by providing timely data for high-priority actions, promoting efficient distribution of funding among competing programs, and improving consistency in programs from year to year and across departments, among other benefits.
- **Greater Accountability**-Data integration allows rapid and more accurate reporting of costs and accomplishments, including full attribution of results to relevant agency units and functions.

MAP-21 Performance Requirements Summary

[What is TPM](#) | [Difference Between PM and AM](#) | [National Goals](#) | **MAP-21 Performance Requirements Summary**

The [Moving Ahead for Progress in the 21st Century Act \(MAP-21\)](#) is a milestone for the U.S. economy and the Nation's surface transportation program by transforming the policy and programmatic framework for investments to guide the system's growth and development. MAP-21 creates a streamlined and performance-based surface transportation program and builds on many of the highway, transit, bike, and pedestrian programs and policies established in 1991.

This legislation integrates performance into many federal transportation programs and contains several performance elements. The FHWA -TPM team is organized to help with coordinating the alignment of MAP-21 requirements, providing guidance, and resources. To assist with this effort FHWA has provided here more information about the specific performance management requirements outlined in MAP-21. Select one of the program areas to learn more about the performance management requirements.

[National Highway Performance Program \(NHPP\)](#)

[Highway Safety Improvement Program \(HSIP\)](#)

[Congestion Mitigation and Air Quality Improvement Program \(CMAQ\)](#)

[Freight Movement](#)

[Implementation Schedule](#)

Difference Between Performance Management and Asset Management

[What is TPM](#) | [Difference Between PM and AM](#) | [National Goals](#) | [MAP-21 Performance Requirements Summary](#)

Asset management is a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost.(23 U.S.C. 101(a)(2), MAP-21 § 1103)

The basic principles of asset management and performance management are identical. As good asset management must be performance-based. In looking to define the relationship between asset management and performance management one must recognize that broad performance management principles apply to asset management as well as other aspects of the transportation system and transportation organizations. While the core principles of asset management and performance management are identical, the application of these principles to different aspects of the transportation system will vary in terms of:

- the appropriate performance measures
- short-term versus long-term focus
- the appropriate strategies for improving performance and
- the timeframe for being able to observe performance changes

For more information visit the [Asset Management Site](#).

National Goals

[What is TPM](#) | [Difference Between PM and AM](#) | **National Goals** | [MAP-21 Performance Requirements Summary](#)

The cornerstone of MAP-21's highway program transformation is the transition to a performance and outcome-based program. States will invest resources in projects to achieve individual targets that collectively will make progress toward national goals. The FHWA TPM team is working collectively with State and Local agencies across the country to achieve the national goals established by MAP-21 regardless of resource limitations.

The national performance goals for the Federal highway programs as established in MAP-21 are as follows:

Federal-Aid Program

[23USC §150(b)]

Safety - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

Infrastructure Condition - To maintain the highway infrastructure asset system in a state of good repair

Congestion Reduction - To achieve a significant reduction in congestion on the National Highway System

System Reliability - To improve the efficiency of the surface transportation system

Freight Movement and Economic Vitality - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.

Environmental Sustainability - To enhance the performance of the transportation system while protecting and enhancing the natural environment.

Reduced Project Delivery Delays - To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices

The National Highway Performance Program (NHPP)

Performance Element	Performance Requirements for NHPP
Performance Measures	<ul style="list-style-type: none"> • Not later than 18 months after date of enactment USDOT, in consultation with State DOTs, MPOs, and other stakeholders will promulgate a rulemaking that establishes measures. • Provide not less than 90 days to comment on regulation. • Take into consideration any comments. • Limit performance measures to those described under 23USC150(c). • For purposes of carrying out National Highway Performance Program USDOT will establish Measures for States to use to assess: <ul style="list-style-type: none"> ◦ Condition of Pavements <ul style="list-style-type: none"> • Interstate System • National Highway System (excluding the Interstate) ◦ Condition of Bridges <ul style="list-style-type: none"> • National Highway System ◦ Performance of: <ul style="list-style-type: none"> • Interstate System • National Highway System (excluding the Interstate) • USDOT will establish the data elements that are necessary to collect and maintain standardized data to carry out a performance-based approach
Performance Targets	<ul style="list-style-type: none"> • States must coordinate, to the maximum extent practical with relevant MPOs in selecting a target to ensure for consistency • MPOs must coordinate, to the maximum extent practical, with the relevant State/s in selecting a target to ensure consistency • Coordination required with public transportation providers. • States and MPOs must integrate other performance plans into the performance-based process

<p>Performance Plans</p>	<ul style="list-style-type: none"> • Asset Management Plan <ul style="list-style-type: none"> ◦ Risk-based asset management plan ◦ States encouraged to include all infrastructure assets within the right-of-way ◦ Plan Contents <ul style="list-style-type: none"> • pavement and bridge inventory and conditions on the NHS, • objectives and measures, • performance gap identification, • lifecycle cost and risk management analysis, • a financial plan, and • investment strategies ◦ USDOT, in consultation with State DOTs, will establish the process to develop the plan through a rulemaking no later than 18 months after 10/1/2012 ◦ States must have a plan developed consistent with the process by the 2nd fiscal year, otherwise federal share for NHPP will be reduced to 65% ◦ Process certification <ul style="list-style-type: none"> • USDOT 90 days review period to determine certification • States have 90 days to cure deficiencies if not certified • Recertification required every 4 years • Management Systems <ul style="list-style-type: none"> ◦ USDOT will establish minimum standards for States to use in developing and operating: <ul style="list-style-type: none"> • Bridge management systems • Pavement management systems ◦ Minimum standards established through a rulemaking <ul style="list-style-type: none"> • Minimum 90 day comment period • USDOT will promulgate a rulemaking not later than 18 months after date of enactment
<p>Target Achievement</p>	<ul style="list-style-type: none"> • "A State that does not achieve or make significant progress toward achieving the targets... for 2 consecutive reports" <ul style="list-style-type: none"> ◦ Document in 23USC150(e) report actions the State will take to improve their ability to achieve the target

<p>Special Performance Rules</p>	<ul style="list-style-type: none"> • Interstate Pavement Condition <ul style="list-style-type: none"> ◦ Minimum condition level established by USDOT through rulemaking ◦ Condition falls below threshold set by USDOT for 2 consecutive reports then: <ul style="list-style-type: none"> • NHPP funding set aside to address Interstate pavement • STP funds transferred to NHPP to address Interstate pavement conditions • This obligation requirement stays in effect until the minimum thresholds can be met (checked annually) • National Highway System Bridge Condition <ul style="list-style-type: none"> ◦ Greater than 10% of total deck area of bridges on the NHS are located on bridges classified as structurally deficient for 3 consecutive years then: <ul style="list-style-type: none"> • NHPP funding set aside to address bridge conditions on the NHS • This obligation requirement remains in place until minimum condition requirement is met (checked annually)
<p>Performance Reporting</p>	<ul style="list-style-type: none"> • State Report on Performance Progress <ul style="list-style-type: none"> ◦ Required initially by October 1, 2016 and every 2 years thereafter ◦ Report includes: <ul style="list-style-type: none"> • Condition and performance of NHS • Effectiveness of investment strategy for the NHS • Progress in achieving all State performance targets • Metropolitan System Performance Report <ul style="list-style-type: none"> ◦ Required in transportation plan every 4 or 5 years ◦ Report includes: <ul style="list-style-type: none"> • Evaluate condition and performance of transportation system • Progress achieved in meeting performance targets in comparison with the performance in previous reports • Evaluation of how preferred scenario has improved conditions and performance, where applicable • Evaluation of how local policies and investments have impacted costs necessary to achieve performance targets , where applicable • Statewide Transportation Plan <ul style="list-style-type: none"> ◦ No required frequency ◦ Optional report on system performance

