

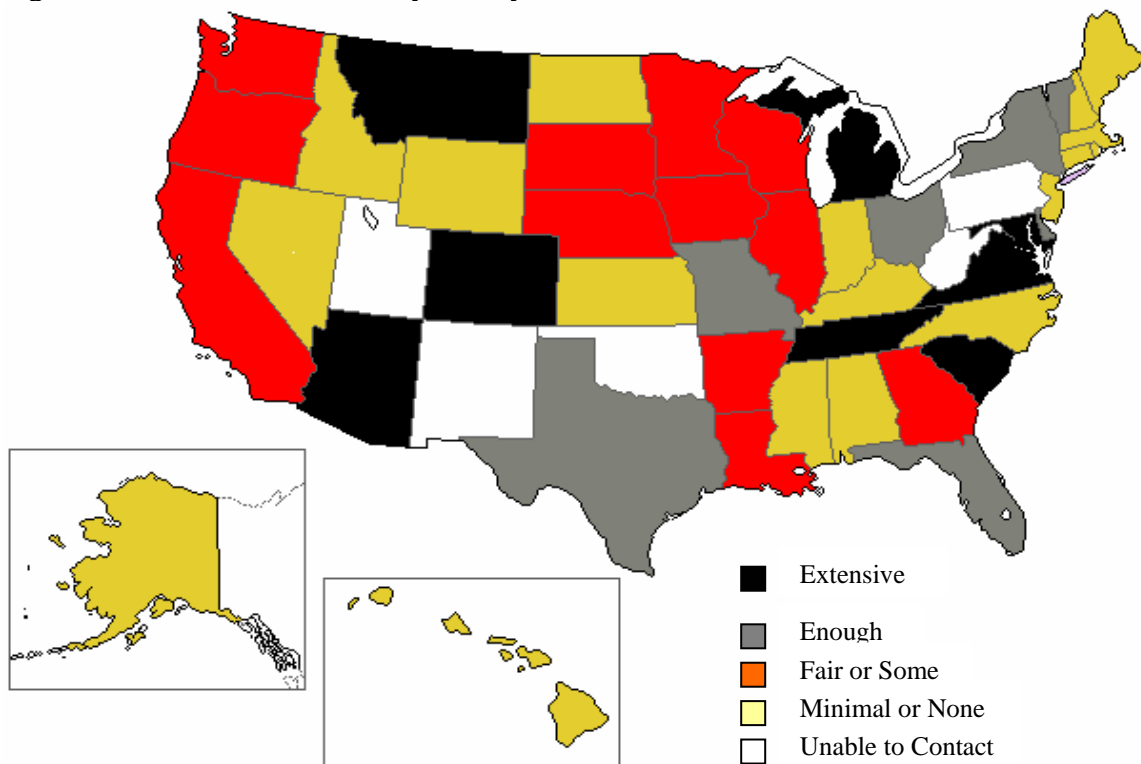
3.1 Introduction

The first step in our research process was to identify state departments of transportation that had strategic planning and/or asset management information available. In order to obtain further information, the research team felt it was necessary to contact as many states as possible. This would determine two things, 1) the extent of information that was available and 2) how advanced other states were in these two fields.

3.2 Methodology

All fifty states were analyzed in this study. Out of the fifty, seven were identified as having extensive material available for the purpose of this study. In conjunction with a Strategic Plan, these seven also were explicitly using Asset Management tools. These states were Arizona, Colorado, Maryland, Montana, South Carolina, Tennessee, and Virginia. Eighteen of the fifty had minimal information about their Strategic Plan. However, nine out of the eighteen states with minimal information concerning their Strategic Plan were still considered important states to follow up on, because they have either mentioned Asset Management in their Strategic Plan or they are beginning to move in the direction of putting Asset Management into practice. **Figure XXX** identifies these states. An example of a state that is moving in the direction of Asset Management practices would be Michigan. They had very minimal information concerning their Strategic Plan, but they are at the forefront of the Asset Management initiative and consider themselves one of the leaders in the field.

Figure XXX States Identified by Survey



Obtaining the Strategic Plan from many states was a two step process. Initially the state web-sites were screened for a document containing the DOT's Strategic Plan. It became apparent that this information was not readily available on all DOT web-sites, therefore, it was important to contact a person in the planning division in order to obtain their Strategic Plan. The research team was either directed to the location of the document or the document was emailed, mailed or faxed.

After tracking down as many of the Strategic Plans as possible, all of the Plans were scrutinized for its content. Goals, objectives, and performance measures were pulled out of the document and studied. Out of these three categories, Asset Management-like practices were identified. Some of these include optimizing the use of all resources, increase investment in programs, and using the Computerized Maintenance Management System (CMMS) that is operational in critical areas for each Modal Administration in Maryland.

3.2.1 Components Identified

Through the process of studying the Strategic Plans that were retrieved, the research team was able to identify some common elements that were mentioned in the documents. These included system preservation, multi-modal tradeoffs, performance programming, maintenance/replacement tradeoffs, resource allocation, decision support using BMS.PMS, maintenance management systems, forecasting/tracking tools, life-cycle costs, priority selection process, budgeting, stakeholder involvement, workplace improvement, and construction. In addition to those components a explicit mention of asset management and performance measures was strictly noted by the research team. However, only six states made specific mention to Asset Management. The remaining states that had a number of the previously mentioned components were considered by the research team to be practicing Asset Management-like activities.

3.3 States Researched

3.3.1 Arizona

Arizona was one of the first states that was identified with an extensive amount of material relating to this research project. Their Strategic Plan contained a comprehensive look at Arizona's short-term and long-term projections for the future. The Strategic Plan devised goals, objectives, and performance measures for the entire DOT, which spanned over all departments. Included in the Strategic Plan, was the mention of Asset Management. Although there was no formal write-up for Asset Management practices, they made mention of some Asset Management-like practices that they were under-going. These practices include four things 1) increasing the quality, timeliness and cost-

efficiency of products and services and 2) optimizing the use of all resources, 3) identifying the number of lanes open to traffic, and 4) using the Average Evaluation Rating.

3.3.1.1 Goals

This has outlined five very specific goals that are applied by all facets of the DOT. These goals include;

Table XXX

Goal 1	Improving the movement of people and products throughout Arizona
Goal 2	Increase quality, timeliness and cost-efficiency of products and services
Goal 3	Develop high performing and successful workforce
Goal 4	Optimizing the use of all resources
Goal 5	Improve public and political relationships to gain support that is necessary to meet Arizona's transportation needs

3.3.1.2 Objectives

Likewise, Arizona's objectives are as specifically stated as their goals are. These numerous objectives that are outlined are useful tools used to accomplish the goals previously stated. A few of these objectives include;

Table XXX

Objective 1	Development process in which congestion management issues are incorporated into the highway development process
Objective 2	The maintaining of consulting costs
Objective 3	Response to inquiries within ten days
Objective 4	Maintaining of total design work at 50% of total Construction Operating Budget
Objective 5	Produce no less than 70% of overall construction engineering program in-house

These along with many other objectives work together to ensure the obtainment and success of the five goals outlined in their Strategic Plan.

3.3.1.3 Performance Measures

In order to ensure the obtainment of these goals and objectives it is necessary to outline some specific measurements in order to guarantee the DOT is on the correct path and that all goals will be met. Arizona has many performance measures. They include;

Table XXX: Ratings used by Arizona

PM 5	Average evaluation rating
PM 6	Injury incident rate
PM 7	Stakeholder satisfaction rating

* PM = Performance Measure

3.3.1.4 Inclusion of Asset Management

3.3.2 Colorado

One of the other states contacted, which also has a comprehensive Strategic Plan, was Colorado. Colorado's Strategic Plan is divided into five different sub-programs, which include Safety, Mobility, System Quality, Strategic Projects, and Program Delivery. These three categories include their own goals, objectives, and performance measures, which will be discussed in the following sections. Similar to Arizona, Colorado also made mention of Asset Management-like practices. These practices include six things 1) preserve transportation system, 2) keep the system available and safe for travel, and 3) increase investment in programs, 4) the use of Surface Condition Rating, Bridge Sufficiency Rating, Maintenance Condition Survey, 5) ensure the maximum useful life, and 6) maximize efficiency of existing infrastructure.

3.3.2.1 Goals

Unlike Arizona, Colorado has a goal for each of its sub-programs. Each of these goals were then followed by specific objectives that would foster the success of reaching each of these goals.

Table XXX. Colorado Goals by Sub-Program

Safety	1.) It is important for them to reduce transportation-related crashes, injuries and fatalities and the associated loss to society
System Quality	1.) Preserve transportation systems 2.) Keep the system available and safe for travel
Mobility	1.) Improve mobility 2.) Increase travel reliability
Strategic Projects	1.) Accelerated completion of projects 2.) Increase investments in various other programs
Program Delivery	1.) Delivery of high quality products and services in a timely fashion 2.) Attract and retain effective and qualified people 3.) Foster an environment that respects workforce diversity

3.3.2.2 Objectives

The objectives are precisely written for the specific sub-program that correlates. The Safety component would like to reduce the rate and severity of incidents while promoting education and awareness. Emphasizing applicable safety features consistent with population growth is an excellent way they feel can accomplish this. Ensuring maximum useful life and maintaining acceptable levels of service and condition are both performance measures used to reach the System Quality’s goals. This component is also geared towards developing a “travel-friendly” transportation system by ensuring investments for aesthetics and environmental concerns. In order to accomplish the goal of preserving mobility Colorado must anticipate its future needs. In order to this they would like to seek external customer feedback and preserve transportation choices for its residents. The number one way they feel they can accomplish this is by maximizing efficiency of existing infrastructure and enhancing quality of life. As for their Strategic Projects sub-program, including performance measures such as promoting partnership with all governments in order to accelerate strategic project delivery is important. This is accomplished through maintaining eligibility of CDOT’s bonding program. Program Delivery is the final sub-program mentioned in their Strategic Plan. It emphasizes fiscal integrity through timely funding while preserving the base funding in correlation with pursuing new sources. CDOT feels that by identifying innovative human resource solutions and creating public confidence by following a planning process ensures that they can fulfill the goals and objectives expressed in their Strategic Plan.

Table XXX Objectives for Colorado by Sub-Program

Safety	1.) Reduce the rate and severity of incidents 2.) Promote education and awareness
System Quality	1.) Ensure maximum useful life 2.) Maintain acceptable levels of service and condition 3.) Ensuring investments for aesthetics and environmental concerns
Mobility	1.) Maximize efficiency of existing infrastructure and enhancing quality of life
Strategic Projects	1.) Promote partnership with all governments in order to accelerate strategic project delivery
Program Delivery	1.) Emphasize fiscal integrity through timely funding 2.) Preserve the base funding in correlation with pursuing new sources

3.3.2.3 Performance Measures

Many performance measures were created and used by Colorado in order to assess the progress towards their goals and objectives. The Safety sub-program outlines a statewide safety incident rate and alcohol-related incidents are compared to the Statewide Incident Rate. Perception ratings and corridor safety assessment improvement sites are also included in this category. As for the System Quality component, surface condition rating and bridge sufficiency rating are very important. A maintenance condition survey and a

quality of life evaluation are administered to ensure that these aspects of the Strategic Plan are being accomplished with a “fair/good” response. The Mobility sub-program uses the Travel Rate Index and Customer Perception Rating, in collusion with a few other measurements, to keep track of the progress they are making in this area. Strategic Projects are concerned with monitoring actual funds encumbered and actual funds expended, in addition to, tracking the number of days it takes to complete payment processing and billing.

Table XXX Performance Measures for Colorado by Sub-Program

Safety	1.) Safety Incident Rate 2.) Perception Ratings 3.) Corridor Safety Assessment
System Quality	1.) Surface Condition Rating 2.) Bridge Sufficiency Rating
Mobility	1.) Travel Rate Index 2.) Customer Perception Rating
Strategic Projects	1.) Actual funds encumbered vs. funds expended 2.) Number of days to complete payment processing and billing
Program Delivery	

3.3.2.4 Inclusion of Asset Management

3.3.3 Tennessee

3.3.3.1 Goals

Tennessee Department of Transportation (TDOT) has taken a proactive approach towards designing their strategic plans. Their approach to strategic planning relies on the managers and staff who actually must implement the plan, which is more likely to result in strategic actions. All the efforts to articulate and carry out a strategic plan are coordinated by the Office of Strategic Planning. Within this office there are four “Goal Teams”, as of September 2002, representing a cross-section and organizational units within DOT, ensuring that ideas are drawn from across all functional units.

In their *2002-2003 Strategic Plan*, TDOT has articulated five goals (TDOT website):

1. Create a departmental culture that emphasizes opportunity, learning, recognition, and accountability for the benefit and development of TDOT employees.
2. Preserve the transportation infrastructure and enhance system capacity with full consideration of social and environmental issues.
3. Create a more effective and efficient process-based organization.
4. Maximize safety of the state's transportation system.

The implementation of each goal is constantly monitored and the entire strategic plan is reviewed and updated on a yearly basis. According to TDOT’s *Progress During 2001-2002* (TDOT website), the April 2002 revision of the *2001-2001 Strategic Plan* resulted

in the elimination of Goal 5 (Develop a Needs-Based Planned Approach to Transportation Systems Development), which is seen as one of the major accomplishments. Also some of the remaining goals underwent changes, described in the 2001-2002 Strategic Plan. Since TDOT constantly monitors and reviews the goals, these are constantly changing to reflect the level of implementation.

3.3.3.2 Objectives

TDOT has clearly articulated 19 objectives for all four goals and 64 strategies associated with them that must be achieved for having successfully carried out the goal. Table T.1 lists these objectives grouped by their goal. Please see appendix XX for a list of the strategies associated with each goal.

Table T.1

Goals	Objectives
Demonstrate that TDOT's employees are our most important resource and critical to our success	Implement at least two new educational or leadership development opportunities for TDOT Employees by June 2003.
	Implement an active employee recognition program throughout TDOT by June 2003
	Reach and maintain parity and increase utilization for underutilized groups within all TDOT Divisions/Regions by January 2005.
	Implement a fair, streamlined and practical performance evaluation system for TDOT by January 2005.
Increase capacity and efficiency of current transportation infrastructure with full consideration of social and environmental issues	Improve traffic flow by identifying and modifying congested locations.
	Improve traffic flow and safety by constructing and operating an Intelligent Transportation System (ITS).
	Maximize the capacity of the existing highway system through effective incident and work zone management.
	Promote increased vehicle occupancy by providing high occupancy vehicle (HOV) lanes on interstate highways.
	Develop and implement a strategy to upgrade intermodal freight connector routes.
	Connect county seats and major rural cities to the interstate system with highways meeting current design standards to promote safety, access, mobility and economic development.
	Develop and implement cost-effective maintenance strategies for the existing transportation infrastructure.
Create a more effective and efficient process-based organization	Provide a method to measure and improve departmental processes.
	Increase our internal and external customer satisfaction.
	Improve internal and external data-sharing and communication using electronic technologies.
	Increase upward and downward communication within the Department among all levels.
Maximize safety of the State's Transportation	Reduce both fatalities and serious injuries resulting from crashes on Tennessee's highway system by 2% annually.
	Provide direction and support for transportation system safety initiatives in TDOT.

System	Integrate (improve) public awareness and education programs for safe driving behavior throughout TDOT and state government.
	Establish a framework for implementing a “target zero” highway safety concept in Tennessee.

(Source: <http://www.tdot.state.tn.us/>)

3.3.3.3 Performance Measures

TDOT has defined seven performance measures in its strategic plan. As with the objectives, these are highly related with the goal they apply for. Table T.2 presents the performance measurements associated with each goal.

Table T.2

Goal	Performance measurement
Demonstrate that TDOT’s employees are our most important resource and critical to our success	Periodic changes in the Organizational Assessment Survey (data currently available: 1997 and 2000)
	Number of executives, managers, and supervisors who have completed mandatory training by category
Increase capacity and efficiency of current transportation infrastructure with full consideration of social and environmental issues	Miles of congested Interstate – 1999 measurement will be used as the base year index.
Create a more effective and efficient process-based organization	Percentage of projects let to contract on schedule, based on the "Top Management Report"
Maximize safety of the State’s Transportation System	Number of fatalities on Tennessee’s highway system
	Seatbelt use in Tennessee
	Number of crashes and injuries on Tennessee highway system

(Source: <http://www.tdot.state.tn.us/>)

3.3.3.4 Inclusion of Asset Management Elements

Even though TDOT’s strategic plan does not specifically talk about Asset Management, it uses some of its key elements. The asset management like activities are mentioned in the strategies for each objective defined in table T.2, being listed in Appendix T.1.

3.3.4 Montana

3.3.4.1 Goals

The goals of the Montana DOT are defined in its Strategic Business Plan through critical success factors that utilize a balance of the following perspectives:

- Financial
- Customer satisfaction
- Business process improvement
- Stable and well-trained workforce

For each of these factors, the Montana DOT has developed a set of corresponding goals and objectives, which are detailed in an extensive set of tables located within their business plan document. Montana DOT has developed several corresponding actions towards the achievement of each of these goals, which are also included in detail within the aforementioned tables.

For the financial perspective, the Montana DOT has defined the following overall goals:

- Maximize revenue streams and explore innovative financing options
- Deliver a cost-effective transportation program to the citizens of Montana
- Develop a consistent, statewide project programming methodology

For the customer satisfaction perspective, the Montana DOT has defined the following overall goals:

- Provide a safe and efficient inter-modal transportation system
- Maximize external customer satisfaction
- Enhance the social, economic, and environmental qualities of Montana

For the stable and well-trained workforce perspective, the Montana DOT has defined the following overall goals:

- Provide a safe and healthy workplace for employees
- Optimize the MDT work environment to assure a qualified and stable workforce
- Use information technology to conduct business efficiently and effectively

3.3.4.2 Objectives

For each of the goals defined in the aforementioned section, Montana DOT has developed a corresponding set of objectives, which are too numerous to include in this section of the report. A complete list of objectives is detailed in an extensive set of tables located within Montana DOT's Strategic Business Plan document.

3.3.4.3 Performance Measures

Montana DOT developed a balance scorecard as an approach to determine the agency's business goals and as the most efficient means of measuring goal attainment or success. The balance scorecard provides a quantifiable method of analyzing the organization and examining its needs from an overall systems perspective, in essence, ensuring that nothing occurs within the agency in isolation (or without effect) on one or more parts of the organization.

The balance scorecard identifies and then builds interrelationships between various components of the organization by placing a focus on the following four defined quadrants:

- Financial
- Customer
- Internal business
- Learning and growth

For its financial quadrant, Montana DOT has defined the following measures:

- Percent of revenue growth per year
- Various cost effectiveness indicators
- Percent variance from annual project mix

For its customer quadrant, Montana DOT has defined the following measures:

- Highway/Air fatalities and injuries
- Customer satisfaction index
- Ridership and wetland creation

For its internal business quadrant, Montana DOT has defined the following measures:

- Percent of project phases and/or projects delivered on time
- Overall ride index
- Employee satisfaction index

For its learning and growth quadrant, Montana DOT has defined the following measures:

- OSHA/WC rates
- Turnover/sick rates
- Percent trained and utilized

In addition, in its Performance Programming Process document, Montana DOT has established objectives, performance measures, and performance targets in the following four program areas:

- Pavement
- Bridge
- Safety
- Congestion

3.3.4.4 Inclusion of Asset Management Elements

As defined within the asset management attribute table (“Table 1: “XXXXXX”), Montana DOT’s Strategic Business Plan document contains the following asset management elements:

- System preservation
- Multi-modal tradeoffs
- Performance programming
- Maintenance/replacement tradeoffs
- Resource allocation
- Decision support using BMS/PMS
- Maintenance management systems
- Forecasting/tracking tools
- Life cycle costs
- Construction
- Budgeting
- Workplace improvement
- Stakeholder involvement

3.3.5 Maryland

3.3.5.1 Goals

The Maryland DOT has divided its strategic plan into two separate plans, the MDOT Strategic Plan and the Maryland Transportation Plan.

The MDOT Strategic Plan defines its goals as follows:

- System preservation and enhancement
- Stable funding for transportation
- Inter-modal planning and smart growth
- Transportation system safety
- Mobility and commerce
- Excellence in government
- Environmental stewardship

The Maryland Transportation Plan defines its goals as follows:

- Smart growth, smart transportation
- System preservation
- Transportation facility and system performance
- Safety and security
- Protecting Maryland's environment
- Providing mobility and accessibility with transportation choice
- Supporting the state's economy
- Moving goods
- Funding our transportation future
- Serving our customers

3.3.5.2 Objectives

The MDOT Strategic Plan presents its objectives in relation to each specified goal. The objectives are defined as follows:

For the system preservation and enhancement goal:

- Develop inter-modal teams to evaluate the condition of MDOT facilities and equipment, explore the benefits of consolidated procurement of major equipment, and propose a schedule for the rehabilitation and replacement of needed facilities to maximize their lifespan at the lowest cost
- As part of the Moving Maryland Initiative, apply Intelligent Transportation Systems (ITS) and information technologies to aid traveler mobility and demand management to reduce congestion throughout Maryland's multi-modal transportation system
- Begin dedicated funds and/or personnel necessary to have Computerized Maintenance Management System (CMMS) operational in critical areas for each Modal Administration
- Plan facilities to aid in the efficient movement of freight in ways that promote job creation, support the vitality of existing communities, and minimize the impact on the environment
- Apply state of the art information technology to the management of freight terminals and operations to provide more efficient service to commercial customers

For the stable funding for transportation goal:

- Continue to apply creative financing for capital projects, and establish private sector partnerships that provide funds for transportation services and facilities beyond the resources of the Department;
- Develop an incentive system for the operating agencies to increase productivity and performance through a sharing of savings or increase in revenues that will be reflected in subsequent budgets;
- Support, through staff and other resources, State Government sponsored efforts to identify ways in which revenues that support the Trust Fund can be enhanced or extended;
- Develop a mechanism for MDOT to share in tax revenues generated by transportation facilitated economic development projects.

For the inter-modal planning and smart growth goal:

- Form a team of modal and TSO staff charged with the developing specific recommendations on how the Department can improve inter-modal planning
- Collaborate with other state and local agencies for all projects in the Neighborhood Conservation Program, Smart Growth Transit Program, Enhancements Program, and Retrofit Sidewalk Program. For each project, document activity of other agencies and how it can affect project scope and timing
- Utilize the administrative and regulatory influence of the Governor's Port Land Use Task Force to direct development to Designated Revitalization areas and to the Port of Baltimore
- Commit 100% of the funds available for the Retrofit Sidewalk Program each fiscal year
- Emphasize the importance of noise abatement through the local subdivision process to local planning offices. Include a policy stating this requirement in update of Maryland Transportation Plan
- When Enhancements Program is reauthorized, revise program criteria to emphasize collaboration with neighborhood revitalization initiatives
- Beginning in FY 2000, budget capital funds where feasible to complete 5% of the bicycle/pedestrian access projects in Access 2000 inventory

For the transportation system safety goal:

- Increase safety for users of the transportation system through the implementation of safety improvement programs, safety and security oversight of transit facilities, and improved signing and delineation
- Develop a comprehensive, multi year Strategic Highway Safety Plan that will serve as a blueprint for enhancing highway safety Statewide
- Ensure that safety requirements are considered in the planning, design, construction, and operation of all transportation system facilities
- Develop and implement comprehensive safety awareness, education, and training programs to increase public awareness of transportation safety issues
- Continue to coordinate risk management programs throughout the Department with the goal of continuing to reduce the frequency and severity of occupational accidents

For the mobility and commerce goal:

- Work with other State Agencies, local governments, and the private sector to identify transportation infrastructure and operational improvements that will improve access to developing and existing job centers and freight locations, and commuter and freight corridors
- Identify specific economic development initiatives to include in the capital budget and Consolidated Transportation Program (CTP), and in setting operating priorities
- Develop and implement a program through the MDTA that actively markets MDOT facilities for public /private partnership - joint development projects. Expedite transfer or reuse of surplus MDOT properties that can be used for economic development
- Work with the Department of Business and Economic Development, the Governor's Port Land Use Task Force, and other State and local agencies to ensure coordination of economic development initiatives
- Develop and publish economic benefit statements for selected major projects included in the current CTP

For the excellence in government goal:

- All Administrations will design and implement a leadership and management program that incorporates the principles of Managing

for Results (MFR) and Continuous Quality Improvement (CQI) to emphasize the provision of consistent quality customer service

- All MDOT employees will be provided with an opportunity to receive a minimum of 8 hours of CQI related training each per year
- Conduct a CQI oriented review of the Office Functions Manual in order to identify, and where possible eliminate duplicate functions that add no value to operations
- Apply appropriate funds In the Consolidated Transportation Information Technology Program towards the utilization of technology that promote more efficient transportation services
- Seek means to enhance employee enrichment initiatives.

For the environmental stewardship goal:

- Mitigate the noise impact of transportation facilities through noise abatement programs to provide additional protection to affected homes and businesses that meet the mitigation criteria
- Maintain MDOT's commitment to bikeways/greenways by connecting and expanding the current 900 miles of greenway to include as much as possible of the areas that have been identified as potential additions
- Establish an inter-modal environmental task force to evaluate the ongoing review and streamlining of federal and State environment laws and regulations pertaining to transportation and transportation facility operations and planning
- Offer training sessions to inform appropriate staff of laws and regulations, their purpose, and how to comply, and to share experiences that may cross modal lines
- Identify forests and wetlands areas for potential preservation, and apply available funding to protect this acreage as available

The Maryland Transportation Plan also presents its objectives in relation to each specified goal. The objectives are defined as follows:

For the smart growth, smart transportation goal:

- Direct transportation funding to Priority Funding Areas and support of the Governor's Smart Growth Executive Order

- Design and coordinate transportation projects, facilities, programs, and services to reinforce local land-use plans and economic-development initiatives that support Smart Growth principles
- Work with local communities to increase their understanding of Smart Growth principles and opportunities and to incorporate Smart Growth into plans and visions

For the system preservation goal, MDOT's objective is to reserve and maintain existing transportation infrastructure and services as needed to realize their useful life.

For the transportation facility and system performance goal, MDOT's objective is to maximize the carrying capacity and operating performance of existing transportation facilities and services.

For the safety and security goal:

- Design, build, and operate facilities services, and programs that reduce the rate of injury and deaths to our customers
- Reduce crimes against property and persons using Maryland's transportation facilities, services, and operations

For the protecting Maryland's environment goal, MDOT's objective is to minimize impacts on, and strive to enhance, Maryland's resources.

For the providing mobility and accessibility with transportation choice goal:

- Increase transportation choices available to access and circulate within and between activity centers
- Increase access to jobs, goods, and services

For the supporting the state's economy goal:

- Target transportation investments to serve existing and growing businesses, as well as housing and commercial markets, that support development and redevelopment opportunities consistent with Smart Growth
- Enhance transportation services and facilities used by business travelers, recreational travelers, and tourists

For the moving goods goal:

- Promote a diverse and interconnected system of freight transportation that leads to the efficient and reliable dispersal and transfer of cargo
- Increase the competitiveness of the Port of Baltimore and BWI Airport cargo facilities and services

For the funding our transportation future goal, MDOT's objective is that for every program period, the Department will strive to meet or exceed the capital investment recommendation of the Commission on Transportation Investment.

For the serving our customers goal:

- Involve customers in transportation decision making from the onset of systems planning through project development and design
- Improve internal accountability of all modes performance through the managing for results initiative
- Improve customer access to transportation products, information, and services

3.3.5.3 Performance Measures

MDOT's performance measures for its strategic plan are located in the agency's Annual Attainment Report on Transportation System Performance, which is an attachment to the Maryland Transportation Plan. The performance measures are defined as follows:

For the smart growth, smart transportation goal:

- Number of projects programmed
- Spending levels

For the system preservation goal:

- Transit vehicle age (to gauge the condition of the transit system) – average age of MTA and WMATA buses
- International Roughness Index (to measure pavement condition) - percent of SHA maintained roads rated fair to very good
- Federal standard for structural deficiency and functional obsolescence (to measure bridge condition) – percent of bridges and overpasses categorized as structural deficiency by federal standards

For the transportation facility and system performance goal:

- Percentage of the State Highway system that is congested using VSF
- Congestion using Level of Service on Freeways and Arterials in Baltimore and Washington region
- Percentage of routes with “successful” or “acceptable” performance
- Average customer visit time
- BWI Terminal Gate Capacity
- Average Annual Peak Hour Throughput at the Fort McHenry and Baltimore Harbor Tunnels.

For the safety and security goal:

- Injuries and fatalities on State and Toll Facilities
- Overall injury and fatalities-number and rate per 1 million population
- Bicyclist injury and fatalities – number and rate per 1 million population
- Number of fatal vehicle collisions at Authority facilities
- Number of vehicle collisions involving injuries at Authority facilities
- Annual fatality and injury collision rate (per 100 million vehicle miles) at Authority facilities
- Number of injuries and fatalities per year on MPA property
- Incidents at BWI
- Ratio of sworn police officers to riders on the transit system
- Dollar value of thefts and damage at MPA facilities, BWI compliance with FAA security inspection

For the protecting Maryland’s environment goal:

- Pollution standard that measures ground level ozone (to measure air quality)
- Percentage of required mitigation that has been completed (to measure the implementation of environmental mitigation and enhancements).

For the providing mobility and accessibility with transportation choice goal:

- Vehicle Miles Traveled (VMT) per capita (state roads only)
- Total transit ridership (all systems)

For the supporting the state’s economy goal:

- Number of direct, indirect, induced jobs affected by investments
- Number of direct, induced, indirect jobs, and jobs related to activities at the Port
- Number of jobs resulting from highway construction

- Total passengers through BWI
- Tons of MPA “general cargo”

For the moving goods goal:.

- Total pounds of cargo moved at BWI
- Annual tons of foreign cargo (bulk and general) moved through the Port of Baltimore
- Tons of MPA “general cargo”
- Annual number of loaded freight cars on state-owned lines

For the funding our transportation future goal;

- Innovative revenues
- Cumulative financing of cooperative capital investment with MDOT
- Difference between proposed CTI funding level and actual program

For the serving our customers goal:

- Percentage of branch office customers rating service as good or very good
- Percentage of riders rating overall MTA effectiveness as excellent, very good, or good
- Percent of satisfied customers
- Percent of external customers survey responses rating SHA performance at B or better.

3.3.5.4 Inclusion of Asset Management Elements

As defined within the asset management attribute table (“Table 1: “XXXXXXX”), the MDOT Strategic Plan and Maryland Transportation Plan documents contain the following asset management elements:

- System preservation
- Resource allocation
- Decision support using BMS/PMS
- Maintenance management systems
- Forecasting/tracking tools
- Life cycle costs
- Construction
- Priority selection process
- Budgeting
- Workplace improvement
- Stakeholder involvement

3.3.6 Missouri

Missouri DOT has undertaken a comprehensive statewide planning effort defined as the MoDOT Long-Range Transportation Direction that examines transportation needs and establishes a direction for the state's investment for all modes of transportation, including:

- Highway systems
- Bridge systems
- Aviation
- Bicycle and pedestrian accommodations
- Freight rail
- Passenger rail
- Bus service between cities
- Public transportation
- Ports

3.3.6.1 Goals

The following transportation goals were developed in cooperation with Missouri DOT's transportation partners who represented rural and urban areas:

- Ensure safety and security of travel, decreasing the risk of injury or property damage on, in, and around transportation facilities
- Take care of the existing system of roads, bridges, public transportation, aviation, passenger rail, and ports
- Relieve congestion to ensure the smooth flow of people and goods throughout the entire system
- Broaden access to opportunity and essential services for those who cannot or choose not to drive
- Facilitate the efficient movement of goods using all modes of transportation
- Ensure Missouri's continued economic competitiveness by providing a safe, reliable, and efficient transportation system
- Protect Missouri's environment and natural resources by making investments that are not only sensitive to the environment, but that also provide and encourage environmentally beneficial transportation choices
- Enhance the quality of our communities through transportation

In addition, Missouri DOT is establishing priorities among each mode's needs, which will allow Missouri DOT to meet the most important needs first.

- Highway and bridge investments will concentrate on the National Highway system and remaining arterials and establish goals for the entire highway and bridge system;
- The state's most important passenger rail needs can be met by implementing the Midwest Regional Rail Initiative on existing rail tracks with modifications between St. Louis and Kansas City;
- Missourians consistently rated public transportation as a high-priority need. Trying to meet 90% of the established needs will bring about significant improvements in urban and rural areas.

3.3.6.2 Objectives

Within its transportation plan, Missouri DOT defines its objectives for each individual mode, including:

- Aviation
- Bicycle and pedestrian accommodations
- Freight rail
- Highway systems
- Bridge systems
- Passenger rail
- Public transportation
- Ports

With regards to highways and bridges, Missouri DOT will work with its transportation partners to identify which major project investments are the state's highest priorities. It will use more measurable factors like safety, connectivity, and traffic growth to establish these priorities.

3.3.6.3 Performance Measures

Missouri DOT went through great lengths to involve the public in the planning process and the development of performance measures.

Road Rallies were held, where randomly selected citizens and civic leaders in different parts of the state were driven along a pre-selected course along state roads and over state bridges. During the journey, the passengers graded road conditions based on factors such as:

- Pavement smoothness
- Lane and shoulder width

- Striping
- Signage
- Others

Missouri DOT had already traversed the same routes and used existing engineering standards to assess the conditions. Missouri DOT then utilized the previously gathered public input to apply scores, based on the aforementioned engineering standards. These scores form the baseline against which Missouri DOT will measure its success in meeting its specified objectives.

In addition, Missouri DOT conducted statewide public surveys of randomly selected citizens and civic leaders to help establish the top priorities for all modes of transportation. According to the survey, the top two priorities among those surveyed are:

- A safe transportation system
- Maintaining the existing system

By maintaining the existing system, Missouri DOT is not implying that no improvements will be made to the existing system. Rather, Missouri DOT's ultimate goal is to bring all aspects of the existing system up to an acceptable level and maintain them there.

3.3.6.4 Inclusion of Asset Management Elements

As defined within the asset management attribute table ("Table 1: "XXXXXX"), Missouri DOT's Long-Range Transportation Direction document contains the following asset management elements:

- Multi-modal tradeoffs
- Resource allocation
- Forecasting/tracking tools
- Life cycle costs
- Construction
- Budgeting
- Stakeholder involvement

3.3.7 Delaware

Delaware DOT has developed its Long Range Transportation Plan document as a strategic tool for long range planning that establishes forward-thinking goals and develops a strategy to achieve these goals.

3.3.7.1 Goals

The mission of the Delaware DOT is:

“To provide a safe, efficient, and environmentally-sensitive transportation network that offers convenient, cost-effective mobility opportunities for people and the movement of goods.”

The goal of the long range planning process is to:

- Set a clearly defined direction that guides and supports the governance of the organization
- Serve as a way to develop and present a common vision and purpose that is shared among all its customers and stakeholders
- Establish an increased level of commitment for the organization to its policies and helps to motivate and direct the achievement of its goals
- Provide a method for improving services to travelers as well as a means of measuring the quality of the service that is provided
- Enable the department to set priorities and to match its planned resources to particular project opportunities

There is a three-tiered framework to identify activities that constitute the DOT’s Plan. These activities are deemed necessary to realize the State’s vision for transportation in Delaware. The three tiers include:

- Principles
- Policies
- Actions

The Plan consists of six core principles:

- Development: “Direct our programs, services, and facilities to support livable Delaware”
- Travel opportunities and choices: “Maximize travel opportunity and choice for all Delawareans”
- Cost effectiveness: “Use cost-effectiveness as one of our fundamental principles”
- Quality of life: “Continue to emphasize quality of life as our foundation”
- Economic development and growth: “Provide transportation opportunities that support economic development and growth”

- Planning and coordination: “Maintain planning and coordination as an integral part of our activities”

3.3.7.2 Objectives

In accordance with its six core principles, Delaware DOT has formulated corresponding objectives.

In accordance with its Development principle, the specified objectives are as follows:

- Coordinate land use and transportation in a manner that promotes long-term transportation efficiency
- Direct or focus transportation investments in Delaware in a manner that promotes sustainable development within designated areas

In accordance with its Travel Opportunities and Choices principle, the specified objectives are as follows:

- Promote an expanded variety of travel opportunities to workplaces, services, residences, and recreational and work destinations, and provide reasonable travel options for those who have limited mobility options;
- Encourage innovative transportation solutions.

In accordance with its Cost-effectiveness principle, the specified objectives are as follows:

- Use cost effectiveness is a key indicator when prioritizing projects or choosing among alternatives – optimizing the investment of resources across all modes and balancing our fiduciary responsibilities with social equity mandates
- Maintain and use existing resources and equipment as a means towards cost effectiveness
- Take advantage of technology as a means of providing efficient services

In accordance with its Quality of Life principle, the specified objectives are as follows:

- Provide environmentally sensitive transportation solutions that minimize negative environmental impacts and promote improved quality of the environment
- Enhance security and safety for all DeIDOT services and facilities

- Make transit facilities convenient and attractive
- Promote safety and quality of life through contextual design of transportation improvements

In accordance with its Economic Development and Growth principle, the specified objectives are as follows:

- Promote transportation's role in local and statewide economic development by improving the accessibility of freight transportation for industry and manufacturing, consumers to goods and services, and workers for jobs
- Support economic development and redevelopment of existing communities

In accordance with its Planning and Coordination principle, the specified objectives are as follows:

- Coordinate activities and investments with other government agencies and offices in Delaware
- Implement ongoing monitoring activities and actions, measuring progress against long-range planning strategies
- Respond to public concerns and needs when creating policies and documents
- Promote planning as a key component of our long-term effectiveness, and implement actions to support effective planning and management

3.3.7.3 Performance Measures

Delaware DOT has conducted a survey of its physical facilities, including:

- Roads
- Bridges
- Rail
- Park and ride/Park and pool
- Aviation
- Ports

Delaware DOT measures its operations through Vehicles Miles Traveled (VMT) and Vehicle Hours Traveled (VHT).

3.3.7.4 Inclusion of Asset Management Elements

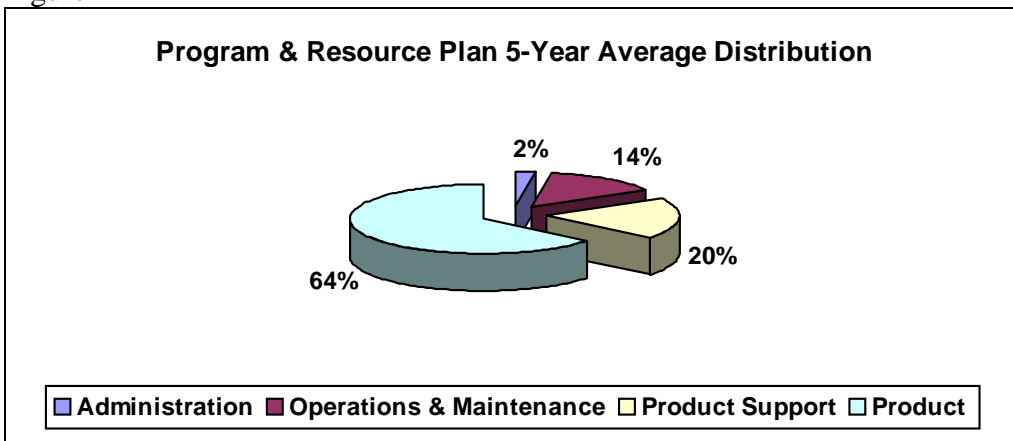
As defined within the asset management attribute table (“Table 1: “XXXXXX”), Delaware DOT’s Long Range Transportation Plan document contains the following asset management elements:

- System preservation
- Maintenance/replacement tradeoffs
- Forecasting/tracking tools
- Budgeting
- Workplace improvement
- Stakeholder involvement

3.3.8 Florida

There is no official Strategic Plan document provided by the Florida Department of Transportation, but it is indirectly accomplished through the published Florida Transportation Plan. The Transportation Plan and Resource Plan provides program levels that form the basis for the Department’s Finance Plan, Tentative Five-Year Work Program, and Legislative Budget Request. Their plan reflects a program budget of \$24.6 billion over a five-year period. The budget was divided and placed in several categories; construction, right-of-way, public transportation projects, product support, operations and maintenance, and administration.

Figure XXXXX



The FTP has two components. They include:

- (1) “a long range component that identifies the goals and objectives for the next 20 to 25 years that are necessary to address the needs of the entire state transportation system, to effectively and efficiently use all modes of transportation to meet such needs, and to provide for the interconnection of all modes in a comprehensive inter-modal transportation system”, and

- (2) “a short range component identifies the objectives and strategies for the next 1 to 10 years that are necessary to implement the goals and objectives identified in the long range component. The short range component defines the relationship between the long range goals and short range objectives, specifies those objectives against which the Department’s achievement of such goals will be measured, and identifies transportation strategies necessary to efficiently achieve the goals and objectives.”

3.3.8.1 Goals

These long-range goals include:

Table XXXX

1.) Safe transportation for residents, visitors and commerce
2.) Preservation and management of Florida’s transportation system
3.) A transportation system that enhances Florida’s economic competitiveness
4.) A transportation system that enhances quality of life in Florida

3.3.8.2 Objectives

The FTP short-range objectives, combined with results of system and program performance evaluations for all program areas, are used in the decision-making process of developing the financial and production targets for each program in the Program and Resource Plan. Additional elements considered include:

Table XXXX

1.) The needs, strategies, and recommended priorities contained in Department modal plans consistent with the goals, objectives and strategies of the FTP
2.) Metropolitan Planning Organization plans
3.) Strategic regional policy plans
4.) Approved local government comprehensive plans
5.) State and federal legislative mandates, including appropriations, proviso language and statues; and
6.) Finance (a review of the Department’s cash balance, Comptroller’s cash forecast, and Finance Plan).

3.3.9 Virginia

The Virginia Department of Transportation has come up with strategic plan 2000-2002 and 2002-2004 biennia, which is a continuation of its 1998-2000 plan. The plan works towards lending a more focus on customer driven activities. This plan emphasizes the full implementation of strategic priorities covering the whole organizational hierarchy. The

following subsections would discuss the goals, objectives and performance measures in detail.

3.3.9.1 Goals

The DOT has established seven major goals. As part of their commitment of moving towards a customer driven organization, one of the primary goals of the organization is to increase significantly the involvement, support and satisfaction of stakeholders and customers. Building new partnerships and relationships has been seen as way to achieve this goal. The other goals of the strategic plan include:

- Recruit/Develop/Retain great workforce
- Improve safety, operations, & maintenance
- Deliver a six-year highway construction program
- Improve use of technologies
- Ensure core functions and initiatives are resourced, investigated and initiate innovative approaches to funding
- Ensure environmental stewardship & transportation planning

There were two critical and common issues, which the department tried to address through these goals. These were, to retain critically skilled and knowledgeable workforce and meet the increasing demands for technology to address transportation needs.

The overall commitment of the agency is to make VDOT a great place to work, which has been the rationale behind the goals. The goals also reflect the overall agency's aim of moving people and goods efficiently using all surface transportation modes – rail, highways and mass transit. VDOT wants to refine the budgeting process in order to fulfill their commitment towards their customers and stakeholders to deliver a quality construction program. The VDOT goals are directed towards achieving this aim.

The strategic goal of ensuring core functions and initiatives are resourced properly with innovative approaches to funding, supports the other goals by warranting the appropriate

resources, finances, manpower, equipment and facilities are available to facilitate the success of each goal.

3.3.9.2 Objectives and Strategies

In order to achieve the goal of customer satisfaction and stakeholder involvement, surveys would be conducted involving motorists, policy makers and other agencies, and the customer satisfaction SOA (Strategic Outcome Area) Committee will evolve strategies based on the results of the surveys.

As one of the objectives of the plan, in order to retain reliable and knowledgeable workforce, the Human Resources Division will develop and evaluate programs designed to increase opportunities for training and educational courses for the staff. A biennial employee satisfaction survey will also be part of the process.

To maintain safe operations, the strategic plan outlined that the maintenance division will implement the integrated maintenance management programs, which includes pavement management system, bridge management system and condition assessment systems. The plan gives strategies to significantly improve construction project delivery through cost-effective techniques and scheduling.

The plan also has an objective outlining increased use and application of Intelligent Transportation Systems to ensure the goal of advanced use of technology. The responsibility to oversee the operations would be of the Technology and Information Management Steering committee (TIMSC).

3.3.9.3 Performance Measures

Measuring performance for customer satisfaction and stakeholder participation, involves significant improvement in results of customer satisfaction survey, satisfaction of state and local officials and support and involvement of other agencies over a period of time. The following is a list of all the performance measures categorized according to goals. Table 1 lists the performance measures for each of the goals.

3.3.9.4 Asset Management Elements

The VDOT strategic plan for 2000-2002 and 2002-2004 does not explicitly mention asset management, but it contains a lot of elements, which are an integral part of any asset management plan. These elements include mention of system preservation, resource allocation, use of management systems as a decision support system, maintenance management systems like PMS and BMS. Stakeholder involvement is a very important part of an asset management system, which has been repeatedly mentioned in VDOT's strategic plan.

Table XXX Goals and Objectives – Virginia

<i>Goals</i>	<i>Performance Measures</i>	<i>Objectives/Strategies</i>
Increase significantly the involvement, support and satisfaction of stakeholders and customers	1. Statistically significant improvement in Customer Satisfaction Survey 2. State and local elected and appointed official's satisfaction, 3. Other agencies' satisfaction support and involvement 4. Customers' reported satisfaction w/ VDOT interactions(captured through Highway Helpline)	<ul style="list-style-type: none"> ⑩ administer customized surveys to determine stakeholder needs and expectations ⑩ inform and educate stakeholders on transportation issues
Recruit/Develop/Retain great workforce	1. Statistically significant improvement in turnover rates, 2. Improvement in biennial results of employment satisfaction survey 3. Increase in number of professional certifications, 4. Reduction in vacancy rates	<ul style="list-style-type: none"> ⑩ Encourage continuous learning programs ⑩ deploy automated systems to improve data collection and quality of information
Improve safety, operations, & maintenance	1. Statistically significant improvement in Pavement Condition Index, 2. Improvement in bridge conditions, 3. Reduction in number of fatalities/accidents, 4. improvement in level of service ratings	<ul style="list-style-type: none"> ⑩ Implement integrated maintenance management program ⑩ examine hazardous locations and construction techniques to increase road safety and reduce congestion in work zones ⑩ Expand the implementation of Intelligent Transportation systems

<i>Goals</i>	<i>Performance Measures</i>	<i>Objectives/Strategies</i>
Deliver a six-year highway construction program	Percentage of project completed on time, completed w/in budget, Improvement of Quality indices, Percentage of project advertised on time, Percentage of projects that close w/ deficit	<ul style="list-style-type: none"> ⑩ Implement ITS and TMS technologies ⑩ Implement project management training ⑩ integrate environmental programs for construction and maintenance programs
Improve use of technologies	<ul style="list-style-type: none"> ⑩ Reduction in variance in ROI ⑩ Increase level of customer satisfaction w/ technology, ⑩ Number of ideas/tech. formally improved, ⑩ Complete all projects w/in resource commitments and schedules 	<ol style="list-style-type: none"> 1. implement strategy technology plan 2. conduct cost-benefit analysis 3. implement project management training
Ensure core functions and initiatives are resourced, investigated and initiate innovative approaches to funding	<ul style="list-style-type: none"> ⑩ Variance in funds budgeted vs. expended ⑩ Achieving/Sustaining avg. daily cash balance that meets est. targets 	<ol style="list-style-type: none"> 1. Examine innovative means of funding and financing 2. examine different ways of organizing to administer related transportation activities
Ensure environmental stewardship & transportation planning	<ul style="list-style-type: none"> ⑩ Implement environmental program for construction and maintenance projects ⑩ Integrate federal and state trans. planning process 	

3.3.10 Michigan

MDOT's strategic planning process involves a process, which incorporates three plans. These are the Michigan Transportation Policy Plan (MTPP), MDOT Business Plan and State Long-Range Plan. The MTPP establishes the mission for Michigan's transportation system and at the same time provides a framework for accomplishing this. The state long range plan acts as a guiding document for public sector transportation investment decisions. The business plan lays out specific objectives for achieving the mission of “providing the highest quality transportation services for economic benefit and improved quality of life”. The following sections would discuss the goals and objectives of the business plan.

3.3.10.1 Goals

The primary goal of MDOT is becoming a customer driven agency. The key to achieving this goal is knowing the customers and understanding their needs. MDOT has clearly outlined in their plan that high customer satisfaction is possible through mutual understanding of both customer needs and transportation system requirements. The plan also states that achieving this goal would help them to be better informed about costs and benefits of an integrated transportation system.

The agency's second goal is also customer focussed, which aims at delivering products and services to meet the customers most important needs. The description of the goal involves many important asset management concepts like implementation of integrated management systems and innovative technology for improved asset management. The goal also includes system preservation, which is perhaps the most important element of any asset management plan.

The other two goals of the plan deal with human resource and organization attributes. Staff training, teamwork and improved decision making are the basis around which these goals have been worked on.

3.3.10.2 Objectives and Strategies

The detailed goals and their objectives of the plan are given in table 2. In order to achieve the objectives as stated, the plan broadly outlines the following strategies. They are:

Goal 1: Customers

- Establishing partnerships
- External communication
- Transportation Service centers
- Policy Direction

Goal 2: Products/Services

- Improve Traffic Safety
- Innovative Technology
- System Preservation
- Rationalization of the system
- Support and strengthen economy
- Regulatory environments

Goal 3: Human Resources

- Prepare MDOT for challenges
- Recognize and reward employees
- Employee Training and Development
- Multi-Cultural Workplace
- Safe Work Environment

Goal 4: Organizational

- Become a process organization
- Become a learning organization
- Internal Communication
- Team-Oriented
- Improve decision making
- Improve Efficiency

3.3.10.3 Performance Measures

MDOT has got implementation strategies, which describes a performance management system, which is focused on improving the performance of individuals and the department. The Performance Management Advisory Council (PMAC) was formed by the strategic leadership team to implement MDOT's Performance Management System. However, there has not been explicit mention on the specific performance measures either in the business plan or their asset management plan.

The Performance Management System has got links with the business plan and its goals as it promotes employee excellence and emphasizes on employee training and development. The system will also help the department to become a flexible and responsive organization.

3.3.10.4 Asset Management Attributes

MDOT has been one of the pioneers of linking asset management attributes to strategic planning. The MDOT business plan has certain strategic objectives, which are directly linked to asset management and many of the asset management concepts are included in

the plan. Following are the attributes of asset management, which has been explicitly mentioned in the plan.

- Asset Management
- System Preservation
- Performance Programming
- Maintenance Management Systems
- Stakeholder Involvement

Table 2: Goals and Objectives - Michigan

Goals	Objectives	Performance Measures
Become Customer Driven	a) Develop improved accessibility to the customers and all the partners to ensure a clear understanding of their needs b) Build consensus in support of transportation initiatives to promote public safety and preserve the existing system.	Not explicitly Stated
Deliver Products/Services to meet customers, most important needs	a) Maintain, preserve and enhance all components of Michigan’s inter-modal transportation system to meet the highest needs of the customers b) implement integrated management systems and innovative technology for improved asset management c) continuously evaluate and refine product and service delivery using process improvement techniques	
Promote Employee Excellence	a) Prepare MDOT personnel to meet future challenges through leadership, team building and employee empowerment b) provide ongoing staff training and development opportunities c) communicate clearly and consistently to the staff	
Become Flexible and Responsive Organization	a) Utilize the philosophy and principles of total quality to become process oriented and customer focussed b) Continuously monitor and respond to the evolving needs of the customers and employees.1	

3.3.11 New York

The New York State DOT has extended their Transportation Program from five-year program to a 12 year program in order to coincide with the Metropolitan Transportation Improvement Programs (TIP). The transportation program lists certain 21st century goals, which are strategic and long-term in nature. The specific objectives and performance measures have also been mentioned in the twenty-first century goals. These have been discussed in detail in the following sections.

3.3.11.1 Goals

The goals have been basically divided into four main groups. These are Bridges, Pavements, Mobility and Safety. The mobility goal has been emphasized the most, as it is the policy of the New York State Department of Transportation that the regions continue to focus on cost-effective mobility and congestion management projects.

3.3.11.2 Objectives and Strategies

All the goals have got specific objectives, which the department addresses in this program. The objectives revolve around three key areas, Safety, Preservation and Serviceability. Maintaining an acceptable level of bridge and pavement infrastructure condition is one of the primary objectives of the program. It also identifies very specifically that maintenance of about 60% of the total lane mileage is essential for having the system in place.

The mobility goal has got detailed objectives and the performance measures, which are very objective specific. The objectives are mainly in terms of reducing the delays of both people and goods. The other important issue addressed in the mobility goal is of reducing congestion. The other objectives of the goal included increasing the bicycle and pedestrian transportation facilities and integrating them with the highway and transit projects.

3.3.11.3 Performance Measures

The performance measures given in the plan are as specific as the objectives. For bridges, Bridge Condition Index (BCI) and Maintenance Condition Index (MCI) are the two main

measures, which decide on the performance, while for pavements surface ratings and ratio of preventive maintenance actions to total actions. Again for the mobility goal, the performance measures are very objective specific. The performance measures for mobility are in terms of Persons-Hours of Delay (PHD), Ton-Hours of Delay (THD) and travel time. The detailed objectives and performance measures are given in table 3.

3.3.11.4 Asset Management Attributes

The plan does not mention any of the important asset management elements, other than system preservation. However, following are the attributes, which were mentioned in the plan:

- system preservation
- performance measures
- priority selection process
- budgeting.

Table XXX: Goals and Objectives – New York

<i>Goals</i>	<i>Objectives</i>	<i>Performance Measures</i>
1. Bridges – Assure a safe and serviceable bridge infrastructure for all public highway facilities in New York state at the lowest practical life cycle cost.	1. Provide mitigation measures to assure that all bridges are safe. 2. Assure an acceptable bridge infrastructure condition through all appropriate life cycle actions 3. Address bridge structural and geometrical features that compromise the efficient movement of goods and people	1. Bridge Condition Index 2. Maintenance Condition Index 3. No load or clearance postings on NHS and other specifically identify routes.
2. Pavement - Maintain a balanced program of preventive maintenance and rehabilitation projects which minimizes the user costs	1. Maintain the system such that at least 60% of total lane mileage is in good to excellent condition. 2. Give priority to projects on the national highway system and other corridors with high commercial traffic volumes	1. percentage of preventive maintenance actions to total actions 2. percentage of overall lane miles with surface ratings 7 or greater
3. Mobility – To move people and goods safely and conveniently at an	1. Reduce the growth of daily recurring persons hours of delay (PHD) by ten percent by the end of first five years of the program period and by additional reductions within 20 years 2. Reduce the growth of daily recurring ton hours of delay	1. Persons-hour of delay (PHD) and person-hour of delay per centerline mile on the CMS network. 2. Ton-hours of delay and ton-hours of delay per centerline mile on the CMS network.

<i>Goals</i>	<i>Objectives</i>	<i>Performance Measures</i>
	<p>(THD) by ten percent by the end of first five years of the program period and by additional reductions within 20 years</p> <p>3. Promote the reduction in single occupant vehicle travel during peak hours</p> <p>4. promote the connectivity of designated National Highway System (NHS) routes to the non-highway transportation modes</p> <p>5. Increase bicycle and pedestrian transportation by programming projects to implement approved bicycle/pedestrian plans</p> <p>6. Reduce congestion, accidents, and long-term infrastructure costs on state arterials by aggressively pursuing arterial management techniques</p>	<p>3. PHD/\$M</p> <p>4. Percent increase in peak hours average vehicle occupancy.</p> <p>5. Number of spot locations eliminated</p> <p>6. Number of dedicated network miles to be functional at the end of 5 years</p> <p>7. Reduction in daily person and ton travel time</p> <p>8. New miles of onstreet bicycle facilities</p> <p>9. Number of corridors where arterial management techniques are to be pursued</p>
<p>4. Safety – Ensure that highway safety is considered in development and implementation of all department programs and projects.</p>		<p>1. Number of locations on Final Regional Work Program (FRWP)</p> <p>2. number of severe and total accidents projected to be reduced as a result of safety capital projects</p> <p>3. Number of treated High Accident Locations (HAL) accidents occurring in capital projects</p> <p>4. number of severe and total accidents projected to be reduced as a result of HAL's treated</p> <p>5.</p>

3.3.12 South Carolina

South Carolina Department of Transportation (SCDOT) developed and deployed its first strategic plan in 1998. Following that initiative a new position, Deputy Director of Strategic Planning, Finance and Administration emerged. This person is responsible for developing performance measurements for each of the business processes of the Department.

The Strategic Plan allowed SCDOT to identify their mission, vision, goals, and values. In early 2000 SCDOT reviewed the 1998 Strategic Plan to make sure that the goals and

objectives were still aligned with what the agency wants to accomplish. Table X.X. presents the goals, objectives, and the associated performance measurements, as they are defined in SCDOT's strategic plan. Since there are many objectives for each of the seven goals, we will proceed by reviewing the main objective of all the goals.

3.3.12.1 Goals

SCDOT has come up with 7 goals, as follows:

- Increase Safety on S.C. Roads and Within SCDOT
- Improve the Quality, Efficiency and Appearance of Highways
- Improve and Expand Multi- Modal Transportation System
- Implement Integrated Financial and Project Management System
- Improve Employee Skills, Work Environment and Opportunities
- Provide Highest Level of Customer Service

Goal 1. Increase Safety on S.C. Roads and Within SCDOT

This goal focuses on safety issues. Its 11 objectives talk about different ways of reducing the number of crashes, injuries and fatalities in different environments. Much attention was given to the reduction by 5% of the number of highway crashes, number of lost workdays due to occupational accidents, speed related accidents, red light running crashes. More importance was given to the work-zone related accidents, for which 10% reduction should be achieved by implementing comprehensive work zone safety programs. Moreover, the implementation of interstate median barriers is under way for approximately 284 miles of highway, which will reduce the number of hits and run-of-the-road-crashes. Clearly, SCDOT has given much attention to the safety issues by defining clear objectives and separate performance measurements for each of these.

Goal 2. Improve the Quality, Efficiency and Appearance of Highways

The quality, efficiency, and appearance of highways is monitored and constantly improved in South Carolina. To help this ongoing process SCDOT has defined 23 objectives that directly impact on the above-mentioned attributes. Special attention was given to the expansion of the Pavement Management System (PMS) to incorporate all paved roads in the state's system. The Maintenance Management System (MMS) is also being implemented and it will allow SCDOT maintenance forces to plan, schedule, record, and develop a systematic program to maintain the state's road network. Bridges are also constantly monitored using the Bridge Management System (BMS), which helps personnel make detailed analysis of bridge needs. Quality is also an important factor. The development and implementation of the Quality Management Team will ensure that constructions are in conformity with plans and specifications. Many other objectives are defined for this goal that will ensure that SCDOT will achieve this goal.

Goal 3. Improve and Expand Multi- Modal Transportation System

This goal was established in an attempt to diversify the modes of transportation and to expand the public transportation coverage in un-served counties by 10%. Also, SCDOT is trying to increase the maintenance savings of public transportation providers by 5% and to increase transit technology statewide. Finally, the most important initiative is to develop a long-range intermodal plan for the state.

Goal 4. Implement Integrated Financial and Project Management System

Integrating financial and project management systems is an important step on the road to asset management. SCDOT initiated several steps to ensure streamlining of the financial and project management systems. The General Ledger Accounting System was modified to allow reconciliation of General Ledger to the Comptroller General System. The use of electronic fund transfers for contract payments is being implemented. Also, a tracking tool will be developed that will allow SCDOT to track schedules and financial requirements for the contracts. This is an important system that gives valuable feedback that eventually will facilitate the integrated decision-making. Other initiatives to improve financial and project management processes were defined (see table X.X.).

Goal 5. Improve Employee Skills, Work Environment and Opportunities

SCDOT has defined some standards for the quality of employees, work environment, and the opportunities. Clear initiatives were taken to ensure the three characteristics would be fulfilled. SCDOT will recruit and attract quality employees and ensure a diverse workforce, provide human resource training programs, provide leadership skill training for managers and supervisors.

Goal 6. Improve Management of Equipment and Technology

Besides highways and bridges, state DOTs have many other kinds of assets. For a good management of these assets SCDOT has initiated the development of a comprehensive Total Asset Management Program that will be fully compliant with the General Accounting Standard Board (GASB) 34. Other initiatives are also were also started, such as the development and implementation of an electronic document management system.

Goal 7. Provide Highest Level of Customer Service

The last goal focuses on improving customer service. Some of the more important initiatives are to survey the public every three years to determine their perception of SCDOT strengths and weaknesses, to complete within 60 calendar days 95% of all requests and complaints received by the maintenance units, and to reduce delays due to incidents on urban freeways through expansion of Intelligent Transportation Systems (ITS).

3.3.12.2 Objectives and Strategies

There are many objectives and strategies defined by South Carolina. For each goal SCDOT has defined initiatives, which are listed in table X.X in the appendix.

3.3.12.3 Performance Measures

As with the objectives and strategies, SCDOT has a plethora of performance measures, which are listed in Table X.X. in appendix X.X.

3.3.12.4 Asset Management Attributes

SCDOT is one of the pioneers of the asset management. As expected, they included many of the asset management elements into their strategic plan, as shown below:

- Multimodal Tradeoffs
- Performance Programming
- Maintenance/Replacements Tradeoffs
- Decision Support Using BMS/PMS
- Maintenance Management Systems
- Budgeting
- Workplace Improvement
- Stakeholder Involvement

3.3.13 Ohio

Ohio is preparing its Business Plan every other year. The Business Plan states the departments' mission, vision, values, and goals. By implementing this plan ODOT expects to see teamwork, quality principles, work force development, and the most efficient processes.

3.3.13.1 Goals

At the higher level, ODOT has defined six goals in their Business Plan. The goals are do not call for some immediate actions; rather they define the key elements, on which the organization should focus on. The six goals are as follow:

- Understand thoroughly the diverse transportation needs of customers.
- Communicate effectively with internal and external customers.
- Refine a planning process that identifies strategies and projects to address evolving transportation needs.
- Deliver projects in a reliable, predictable and timely manner to ensure achievement of transportation goals.
- Excel at preventive maintenance practices to maximize public's investment.
- Be a quality culture that embraces continuous improvement.

3.3.13.2 Objectives and Strategies

At a lower level, ODOT has defined many strategic initiatives that are set forth to move the Department towards accomplishing the stated goals. They call for improvements in the freeway network, development of a system to measure and manage congestion, improvement in their mission-critical snow and ice control, and efforts to ingrain Quality

Principles into the way they do business. Also, developing a modern customer-friendly project management system was defined as a main objective. This last main objective will help better manage the fiscal forecasting and project tracking systems. ODOT's eleven strategic initiatives are listed below:

- Update ACCESS Ohio
- Develop Strategies to Measure and Manage Congestion
- Develop a Modern Customer Friendly Project Management System
- Re-defining County Priorities
- Build bridges Faster, Smarter, Better
- Improve Quality of its Construction Plans
- Modernize Its Construction Administration Practices
- Change the Way ODOT Currently Test and Accepts Materials
- Develop Innovative Contracting Methods
- ODOT Will Expand Partnering
- Will Continue to Emphasize the Snow and Ice Initiative

In their business plan ODOT elaborated on each one of these eleven strategic initiatives, establishing clear steps that needs to be taken to implement them. Also, ODOT has assigned responsibilities for the ownership of the initiatives and clearly spelled out the affected ODOT Central Offices. Appendix **X.X**. lists all eleven strategic initiatives with their associated steps, which ODOT defines as goals related to the initiative.

3.3.13.3 Performance Measurement

ODOT has not defined performance measurements, as such. Rather, they are defined in their goals related to the strategic initiatives.

3.3.13.4 Inclusion of asset management

Just as with the performance measurements, ODOT has not specifically mentioned about asset management in their business plan. However, many of the goals related to strategic initiatives include element of asset management, presented below:

- Performance Programming
- Forecasting/Tracking Tools
- Construction
- Priority Selection Process

3.3.14 Texas

Texas Department of Transportation has put together their Strategic Plan 2003-2007, which defines their major initiatives, recent and current challenges, possible solutions, funding options, and conclusions. More importantly, Texas has undergone a process to identify the transportation challenges and develop solutions for building a new vision for Texas's transportations needs with clear goals and supporting actions.

3.3.14.1 Goals

The above-mentioned process resulted in defining five major objectives, which will enable TxDOT to work towards the priority goal, as defined by the Governor: “To provide for all of Texas’ transportation needs of the new century”. The five objectives are listed below:

- Reliable Mobility
- Improved Safety
- Responsible System Preservation
- Streamlined Project Delivery
- Economic Vitality

The “Texas Transportation Partnership” is a blueprint for addressing the huge transportation challenges facing Texas and it defines the vision of Texas’ transportation future, goals critical to attaining this vision and recommended actions for meeting these goals. For each of the defined long-range objectives, a specific goal was defined, listed below:

- Enhance Texas and urban metropolitan area mobility and ensure that congestion is less than in comparable peer US cities.
- Reduce the fatality rate on Texas roadways by five percent within ten years.
- Ensure that 90% of Texas’ roads and 80% of bridges will be in good or better condition within 10 years.
- Improve project delivery from project conception to ribbon cutting, on average, by 15% within 5 years.
- Attract and retain businesses and industry with adequate transportation systems and services.

3.3.14.2 Objectives

For achieving the defined goals TxDOT has also defined strategies that needs to be taken into account to fulfill the stated goals. These strategies are accompanied by actions to be taken, recommended partnerships actions to support the stated goal, as well as personnel responsible for fulfilling them. Table X.1 lists the strategies to be taken.

3.3.14.3 Performance Measures

To align the TxDOT’s business practices with the five main objectives, defined in their strategic plan, the performance measurements were revisited. TxDOT’s current planning framework makes use of 121 performance measurements, out of which 28 are considered key measurements. The new format suggests on five budget strategies with streamlined set of performance measurements following from that, related to as outputs and efficiency measurements, as sown in Table X.2.

On the other hand, for each of the five goals defined in the strategic plan TxDOT has defined one item to measure the success of the goal. These are listed in Table X.1.

3.3.14.4 Inclusion of asset management elements

As many other states, Texas has not specifically mentioned about asset management in their Strategic Plan and Transportation Partnership. However, some of the asset management like activities emerged from the two documents, as presented below:

- System Preservation
- Multimodal Tradeoffs
- Priority Selection Process
- Budgeting

Table X.1. Texas Goals, Strategies and Performance Measurements

Goal	Strategies	Performance Measure
Enhance Texas and urban metropolitan area mobility and ensure that congestion is less than in comparable peer US cities	Consider the range of transportation alternatives as a part of all capacity improvement studies	Compare mobility statistics for Texas cities to their peers nationwide
	Increase transit availability in rural, urban and metropolitan areas	
	Increase the number of transit trips in rural, urban and metropolitan areas	
Reduce the fatality rate on Texas roadways by five percent within ten years	Increase the number of safety improvements completed.	Decrease in recorded fatalities per 100 million miles traveled
	Decrease the time required to install traffic signals	
	Increase the number of highway/ railroad crossings that are improved	
Ensure that 90% of Texas' roads and 80% of bridges will be in good or better condition within 10 years	Explore transportation modes and material alternatives that will reduce total life cycle preservations costs	Improvements in pavement condition and bridge inspection scores
	Preserve and upgrade general aviation facilities	
	Resurface and rehabilitate roadways to preserve investment	
	Replace or improve bridges in a timely fashion	
	Replace aged transit vehicles to minimize maintenance and operation costs	
Improve project delivery from project conception to ribbon cutting, on average,	Reduce the total time from project identification to ribbon cutting	Reductions in the overall project planning, design and construction time frames
	Increase the percentage of project deadlines met	

by 15% within 5 years	Expand hours of construction where appropriate to night- time and off- peak periods (within two years)	
Attract and retain businesses and industry with adequate transportation systems and services	Eliminate gaps or bottlenecks in the Texas transportation systems	Growth in the Gross State Product
	Decrease border -crossing time	
	Encourage the use of rail and barge as alternatives to highways for surface freight shipment	
	Improve the average travel speed on congested trade corridors	

Table x.2 Budget Strategies with their related performance measures

Budget Strategy	Output	Efficiency Measure
Plan It	# of plans delivered on time	% of plans delivered on time
	# of parcels delivered on time	% of parcels delivered on time
	# of projects reviewed for environmental impact	% of projects mitigated
	# of innovations resulting from research	
	# of rail projects developed	
Build It	# of projects build to increase capacity	
	# of bridges replaced or rehabilitated	
	# of airports receiving assistance	% of general aviation airport needs funded
	# of high crash locations improved	
Maintain It	# of lane miles receiving surface improvements	% of state highway system receiving surface improvements
	# of signs/junkyards/auto graveyards brought in compliance	
Maximize It	# of transit providers receiving assistance	
	# of permits issued	
	# of vehicles registered	
	# of entries receiving auto theft prevention grants	
	# of motor vehicle consumer complaints resolved	
	# of highway safety grants awarded	
	# of travelers served	
Manage It		

3.3 Similarities Among States

3.5 Conclusions