

Report on
**PERFORMANCE-BASED FEDERAL-AID
HIGHWAY PROGRAM**

In Preparation for SAFETEA-LU Reauthorization

September 2007

AMERICAN ASSOCIATION OF
STATE HIGHWAY AND
TRANSPORTATION OFFICIALS

AASHO
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Chapter 1: OVERVIEW

Introduction

This report by the American Association of State Highway and Transportation Officials (AASHTO) focuses specifically on development and implementation of a performance-based Federal-Aid Highway Program* (FAHP) in preparation for reauthorization of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). It follows an earlier AASHTO report for the National Surface Transportation Policy and Revenue Study Commission (the Commission) entitled *State DOT Performance Management Programs: Select Examples* published in June 2007 that examined performance-based surface transportation program approaches being currently being implemented at some of the State Departments of Transportation (State DOTs) around the country. Building on that primer, in this report, a basic foundation of the federal budgeting and program delivery principles of the highway program in relation to performance measurement is discussed, followed by an overview and detailed state-level examination of performance and accountability.

State DOTs use performance management for a variety of functions from statewide budgeting and resource allocation to asset and systems management to executive dashboards. (Specific examples of a holistic approach to performance management as seen in a number of states will be discussed later in Chapter 4.) It is the intent of this report that its findings on the current state of the performance-based highway program as implemented by the State DOTs will be taken into consideration as Congress undertakes the SAFETEA-LU reauthorization process over the coming years.

The concept of performance measurement, or measurement on a regular basis of the results (outcomes) and efficiency of services or programs¹, is nothing new in the public sector. Whether it was known as the RAND Corporation's "systems analysis" in the 1950s or Planning-Programming-Budgeting Systems (PPBS) in the late 1960s, the need to better understand and control outcomes has always been recognized.

As such, the use of performance measurement among the federal, state, and local transportation agencies across the United States already exists. The sheer breadth and complexity of the transportation network in this country, however, pose a significant logistical and conceptual challenge in collection, organization, analysis, and application of information based on performance measures as a whole. Fortunately, as the pace of

* It is critical to understand the meaning of the word "program." First, "program" is used as an umbrella term referring to activities administered by the Federal Highway Administration (FHWA), the Federal Motor Carrier Safety Administration (FMCSA), and the National Highway Traffic Safety Administration (NHTSA) that receive Highway Trust Fund (HTF) funding. When this report uses "program" in this all-encompassing sense, it will use the term "Federal-Aid Highway Program" or FAHP. Second, "program" also refers to any one of the separately funded categories that make up the overall FAHP.

development of better tools and methods increases, there are a number of successful performance-based transportation programs from which lessons can be drawn.

The benefits of a performance-based FAHP is obvious: it allows for more efficient allocation of increasingly scarce resources, aids in development and justification of budget and project proposals, and holds government agencies responsible for funding, constructing, maintaining, and operating the highway network accountable to the road users and the public at large.

At the same time, it is imperative to consider the inherent limitations of performance measurement². First, performance data do not, by themselves, tell why the outcomes occurred. Examining performance data does not tell the story behind the numbers, nor provide the context under which such data was generated. Second, some outcomes cannot be measured directly, such as prevention of undesirable events. Third, information provided through performance measurement is just part of the information managers and elected officials need to make decisions. Fourth, as there exists a vast range of factors and considerations faced by State DOTs around country, it is important to avoid using performance measures as a “one-size-fits-all” tool to rank and draw absolute conclusions of State DOT performance.

Barriers to More Rapid Implementation of Performance Management

While significant progress in implementing performance-based management approaches has occurred over the past few years, there are a number of impediments that can constrain the ability of an agency to become truly performance-driven. These impediments may occur at the federal or state levels and the recommendations in the following section are aimed at reducing these barriers.

1. *Leadership and Organizational Commitment.* Implementation of comprehensive performance management requires a sustained multiyear effort and significant resources. It also reflects a change in organizational culture. Staff resistance often reflects concern about appropriate measures, the linking of performance to budgets, perceptions that performance measurement represents an additional responsibility and skepticism about whether a new approach will continue in the long term. These issues must be overcome with strong and sustained leadership and compelling demonstrations of the value of performance based program management and resource allocation.
2. *Fund Allocation Rules and Restrictions.* Fund allocation restrictions at both the federal and state levels can hinder the application of performance management. Restrictions on fund eligibility, lack of flexibility to shift funds among programs and geographic allocation formulas, while often reflecting concerns about equity and program balance, can hinder true performance-based management. As an example, a number of narrowly based federal safety funding programs targeting

various behavioral factors, may restrict the ability to target funds where the most significant performance improvements are possible.

3. *Funding Uncertainty and Reduced Purchasing Power.* Lack of predictable and stable funding, whether due to reduced yields from specific funding sources or dramatic increases in inflation, make it difficult to predict or deliver performance results.
4. *Project Earmarks.* At either the federal or state level project earmarks reduce the ability to target funds where the best overall performance results may be achieved.
5. *Project Selection Processes.* A project selection process that allows too much discretion in selecting projects irrespective of overall system performance considerations may not produce the best results for overall system performance. For example, many states have very decentralized processes for selecting projects, at least for some project or funding categories. Unless statewide performance objectives are translated into regional or district objectives, it is unlikely that statewide objectives will be met. At the other end of the spectrum, strong legislative involvement in selecting projects irrespective of cost/benefit or predicted performance results also may not yield the optimal system performance results.
6. *Standards.* In the 20th century, establishment of uniform national standards for highway construction and operations was a major element contributing to achieving safe, modern, consistent public services, especially the interstate system. Safety concerns remain paramount, but today, with increasingly limited funding, universal application of design standards regardless of performance benefits can conflict with performance-based management and result in less than effective use of resources.
7. *Process Compliance Requirements.* Public sector performance-based management as it was introduced in the 1990s was founded on the principle of establishing accountability for results while providing greater flexibility for states and local governments in methods of delivery. Low-performing organizations were to receive greater oversight and technical assistance, and high-performing organizations less. In practice, federal agencies still often mandate specific activities regardless of performance level.
8. *Communication.* Effective communication of performance results, both good and bad, to a variety of audiences is a challenge. The selection of appropriate media, balance of text versus graphic displays, the number and level of detail of the measures reported, and the approach to explaining actual results are all issues that must be addressed. While a significant benefit of performance management is transparency and accountability to stakeholders, the communication strategy must educate stakeholders on realistic expectations and the factors affecting specific results, some of which may be outside of the agency's control.

9. *Data and Management Systems.* Developing and integrating the databases required to support a performance management program is a critical component for a successful program. Consistency in the quality and availability of data and access to data by different organizational units are specific challenges that must be overcome. Similarly, while all states have management systems covering at least some key aspects of performance, many legacy management systems are not well suited to support a performance management process. Updating systems, data integration, and other needed IT support capabilities often require a significant investment of resources.
10. *Hard to Measure Areas.* Ideally a comprehensive performance management program includes all aspects of performance that are critical. In reality, some measurement areas, while very important, are difficult to measure for a variety of reasons. One example is the performance of the freight transportation system. The majority of this system is privately owned and much of the data is proprietary. Other difficult to measure areas include the environmental, quality of life, and economic aspects of performance.

Recommendations

While most states are implementing performance-based management approaches, all states can further strengthen their performance management processes to reduce the barriers noted above. State DOTs can and should bring about more rapid deployment of comprehensive performance management programs covering all critical activities and functions of transportation agencies. Federal statutes need to be updated accordingly, and the federal government needs to enhance its research, development, and technology (RD&T) in the areas of performance management. Detailed explanations of the following recommendations can be found at the end of Chapters 2 and 3.

Recommendations for Federal Government

1. *Create a pilot program in the reauthorization legislation to delegate federal highway program to states in exchange for comprehensive State DOT performance management processes.* One of the boldest and innovative possibilities is to create a pilot program that delegates the Federal-Aid Highway Program to states in exchange for development and implementation of comprehensive performance management processes in the pilot states. This pilot program open to all states would test the concept of a performance-based management approach in the obligation of federal funding under FAHP. (Refer to page 29.)
2. *The linkage between transportation and the economy needs to be more fully assessed and articulated by the federal government.* The critical role that transportation system plays in helping to maintain and improve the national economy needs to be better understood. Through renewed policy research, the federal government should strengthen the case of the significant impact of highway investment on the economy in their annual budget justification process to Congress. A number of illustrative examples can be found in Chapter 2. (Refer to page 16).

3. *Increase overall transportation funding and increase the share of core highway programs in the reauthorization legislation.* To keep the United States competitive in the global economy, surface transportation investment must be substantially increased over the next two decades and beyond, not only for highway and transit, but also for freight, as noted earlier, and passenger rail. At the same time, Congress must acknowledge the driving role of “core” FAHP programs in prioritizing needed investments by increasing the share of core highway programs to as close to 100% of total FAHP. (Refer to page 18.)
4. *Restructure federal safety programs in the reauthorization legislation to better integrate performance measures.* A restructuring of safety program funding by USDOT could further orient FAHP to improve safety-related outcomes. One way to accomplish this would be to restructure multiple federal safety funds from the National Highway Traffic Safety Administration (NHTSA) and the Federal Motor Carrier Safety Administration (FMCSA) into a consolidated funding pot based on performance tiers. (Refer to page 21.)
5. *Create incentive programs in the reauthorization legislation to optimize resource allocation at the state level.* Create incentive programs for states to modify their laws and regulations that restrict more performance-based resource allocation such as restrictions on the use of revenues and earmarks.
6. *Greater performance orientation and streamlining of FHWA programs.* Examine other FHWA programs that may be collapsed in the reauthorization legislation in order to expand the core share of the total dollars authorized and to simplify the Federal-Aid Highway Program process. This will allow for greater performance oriented of the highway program as noted above in Recommendation 3 on the safety programs.
7. *Enhance the federal research, development, and technology (RD&T) efforts on performance management to support the needs of State DOTs.* Encourage State DOT performance management processes through federal research and development in hard to measure areas such as freight, economy, and environment. In addition, the federal government should sponsor peer exchanges, workshops, and other activities aimed at developing and sharing best practices.

Recommendations for AASHTO and State DOTs

1. *Explore and streamline state funding allocation rules and practices.* Conduct a survey of state funding allocation rules and practices and other barriers to comprehensive performance management at the state level and work with the National Conference of State Legislatures (NCSL) to develop specific strategies to reduce these barriers.
2. *Share best practices and expand comparative performance measurement.* Significantly enhance use of comparative performance measurement to improve service delivery and system performance by sharing best practices and develop a

specific work program, including the measurement areas and timeline, for expanding comparative performance measurement.

3. *Recognize leading states that utilize comprehensive performance management programs.* Establish a program to recognize states that have implemented comprehensive performance management programs and can demonstrate the use of performance data in funding and management decision-making processes. Such a program might be similar to the recognition given to best practice examples in planning, environment, and other areas.
4. *Provide robust technical assistance.* Sponsor targeted peer exchanges, workshops, and scanning tours aimed at increasing the application of performance management practices and publish performance data that communicates the impact of such programs. This includes recommending, and tracking the results of, research and technical assistance programs through NCHRP, SHRP II, and other programs to improve the data, management systems, and organizational capabilities required to successfully implement comprehensive performance management approaches.
5. *Develop programs to help modernize organizational culture.* Develop material and educational programs that specifically target agency CEO's and mid-management levels to overcome resistance and support cultural change. This should include providing compelling examples that demonstrate the value and effectiveness of performance based program management and resource allocation.

Chapter 2: PERFORMANCE-BASED FEDERAL-AID BUDGET AND PROGRAMS

National Annual Budget Process³

In order to better establish the context for highway program funding in the United States, it is essential to discuss the annual budgeting process that takes place to allocate national resources to all areas deemed necessary for federal funding and oversight.

In February of each year, the President submits to Congress a detailed budget request for the coming federal fiscal year, which begins on October 1. This budget request, developed by the Office of Management and Budget (OMB), informs Congress what the President believes overall federal fiscal policy should be, lays out the President's relative priorities for all federal programs, and signals to Congress a set of spending and tax policy changes from the President.

After receiving the President's budget request, Congress generally holds hearings to question Administration officials about their requests and then develops its own budget resolution. Once the draft budget resolution is developed by the House and Senate Budget Committees, it is then presented to the House and Senate floor. Upon completion of the joint House-Senate conference to resolve any differences, a conference report is passed by both houses. The final budget resolution is then considered a "concurrent" congressional resolution, which does not require the President's signature like most bills.

Table 1. Timetable for Federal Budget Process

First Monday in February	President submits budget
February 25	Committees submit views and estimates to Budget Committee
April 15	Deadline for adopting budget resolution for coming year
May 15	Annual appropriations bills can be reported out
June 10	Deadline for reporting out all appropriations acts by House
June 30	Deadline to pass all appropriations acts by House
September 30	Deadline for enacting all spending measures
October 1	Fiscal year begins

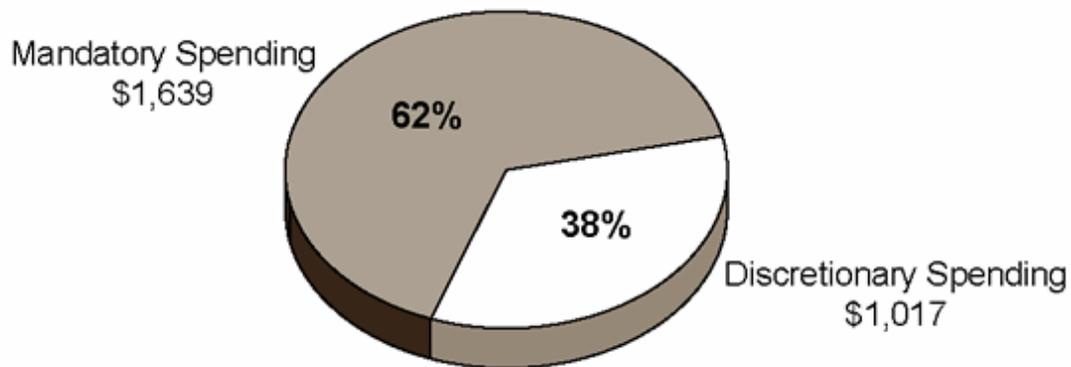
Source: Financing Federal-Aid Highways. *Federal Highway Administration. US Department of Transportation.*

It is important to note that spending totals in the budget resolution are stated in two different ways: the total amount of budget authority that is to be provided, and the estimated level of expenditures, or outlays. Congress uses budget authority to determine the amount of spending a federal agency is allowed to commit, while outlays are determined by the amount of money actually leaving the Federal Treasury in a given year. For this reason, budget authority represents a limit on how much funding

Congress will provide, and aids Congress in making most budgetary decisions. However, outlays, because they represent actual cash flow, determine the size of the overall federal deficit or surplus.

In addition, the Budget Enforcement Act of 1990 divided federal spending into two categories – mandatory and discretionary (Figure 1) – based on the ability of Congress to control spending through the annual appropriation process. Mandatory spending accounts for about two-thirds of all spending and is authorized by permanent law, and includes outlays for entitlement programs such as Food Stamps, Social Security, and Medicare. By contrast, discretionary spending refers to those programs that are subject to annual funding decisions in the appropriation process, such as funding for defense, crime reduction, highways, mass transit, and others⁴.

Figure 1. FY 2006 Federal Spending (In Billions)



Source: Financing Federal-Aid Highways. Federal Highway Administration. US Department of Transportation.

Authorizing Legislation

The scope of the federally-funded highway program in the United States is determined by its authorizing legislation. Since the Federal-Aid Road Act of 1916 and the Federal Highway Act of 1921, the Federal-Aid Highway Program has been continued or renewed through the passage of multi-year authorization acts⁵, with the current iteration of the program defined by SAFETEA-LU, which was signed into law on August 10, 2005, by President George W. Bush. With guaranteed funding for highways, highway safety, and public transportation totaling \$244.1 billion, SAFETEA-LU followed the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21) in providing the foundation for articulating and implementing the national surface transportation vision. ⁶ Surface transportation acts can vary in their scope and duration. Most surface transportation acts are multi-year bills, such as ISTEA and TEA-21, each of which covered a 6-year time span, although stop-gap funding bills can be used in case a multi-year bill expires. The multi-year authorizations are crucial financial planning tools for a capital program in which the development and delivery of complex highway construction projects can take more than six years.

Federal-Aid Highway Program Principles

There are general principles of FAHP that have been established and gradually progressed upon since FAHP's inception in the early 20th century. The unique nature of FAHP, especially compared to most other federal programs, can be attributed to the following set of principles⁷:

Federal Program Delivery / State Project Delivery. Since 1916, a close cooperation has existed between federal and state government for the highway program based on the concept of Federal-Aid. Under this arrangement, the federal government establishes national goals and requirements for the highway program, and the states select and carry out the specific projects within this program in their respective jurisdictions. Under this framework, states have explicit authority to establish their transportation improvement programs to select and prioritize projects in compliance with federal requirements.

Trust Funded with Budgetary Firewalls. Unlike most discretionary programs in the federal government, the highway program is able to provide advance notification of the available Federal-Aid highway funds to states for a given multi-year period without the need for annual appropriation acts. This is enabled by contract authority granted to FAHP and the Highway Trust Fund (HTF) which has been specified to provide funds only for highway and transit purposes. Further, FAHP is bolstered by budgetary firewalls included in TEA-21 and SAFETEA-LU, which maintain a separate spending cap for the highway and transit programs leaving them "protected" from impacts of spending for other federal discretionary programs.

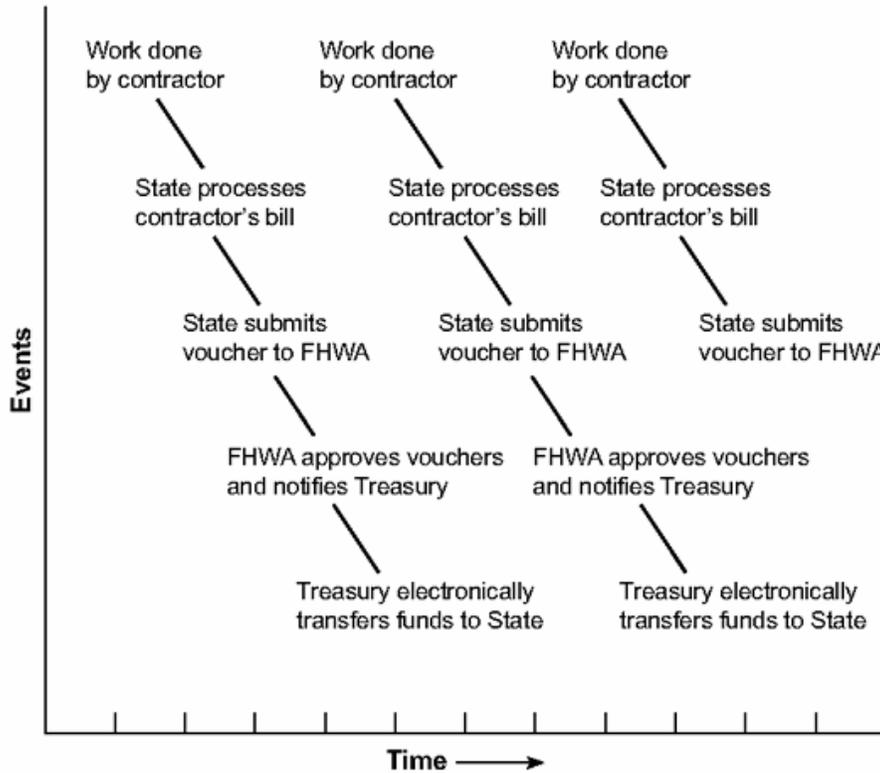
Revenue From User Taxes. The HTF revenue is generated by users of the highway system primarily in the form of excise tax on fuel, including gasoline and gasohol (currently 18.4 cents per gallon), diesel (currently 24.4 cents per gallon), and special fuels, among others. Other supplemental revenue sources include various fees on large tires, truck and trailer sales, and heavy vehicle use.

Pay-As-You-Go Feature. There are vehicles in place, such as the Byrd Amendment, to ensure that the proceeds of the taxes dedicated to HTF are always sufficient to make reimbursements when claims are made. If an imbalance between projected revenue and projected project authorizations resulting in a shortfall is expected, program apportionments may change accordingly.

Reimbursable Program. FAHP is not a "cash-up-front" program. While the authorized amounts are distributed when funds are apportioned to the states, no cash is actually disbursed; instead, states are notified of the availability to federal funds that can be committed to projects. Instead, the federal government makes payments to the states for costs as they are incurred on previously-approved projects, and only for the amount of the federal share on such projects. (Figure 2) Therefore, states must first advance their own funds to pay all invoiced costs. This requires state legislatures to supply sufficient funding to ensure cash flow for contractor payments and provide state/local match for

federal funds. It should be noted that most major highways are owned and operated by the states with funding from state resources, such as the state motor fuel taxes.

Figure 2. Reimbursement Process



Source: Financing Federal-Aid Highways. *Federal Highway Administration. US Department of Transportation.*

Existing Performance Management Processes and Measures

As public demand for improved results and greater accountability from all levels of government has increased, performance-based management has continued to evolve. That trend continues unabated to this day.

At the federal level, the Government Performance Results Act of 1993 (GPRA) was enacted to hold federal agencies accountable for using resources wisely and achieving program results. GPRA requires agencies to develop plans for what they intend to accomplish, measure how well they are doing, make appropriate decisions based on the information they have gathered, and communicate information about their performance to Congress and to the public. GPRA requires agencies to develop a five-year Strategic Plan, which includes a mission statement and sets out long-term goals and objectives; Annual Performance Plans, which provide annual performance commitments toward achieving the goals and objectives presented in the Strategic Plan; and Annual Performance Reports, which evaluate an agency's progress toward achieving performance commitments⁸.

As a result of President Bush's emphasis on e-government as noted in his 2001 Presidential Management Agenda, GPRA's goals were further refined through the use of the Program Assessment Rating Tool (PART). PART, which provides continuously updated information about federal performance to the public through vehicles such as the ExpectMore.gov website, "helps [to] identify a program's strengths and weaknesses to inform funding and management decisions aimed at making the program more effective. PART therefore looks at all factors that affect and reflect program performance including program purpose and design; performance measurement, evaluations, and strategic planning; program management; and program results. Because PART includes a consistent series of analytical questions, it allows programs to show improvements over time, and allows comparisons between similar programs."⁹ For the "Highway Infrastructure program" which is described as the Federal Highway Administration's (FHWA) "federal financial and technical assistance to states to construct and maintain a national system of roads and bridges,"¹⁰ PART has rated it as "moderately effective," based on the following assessment:

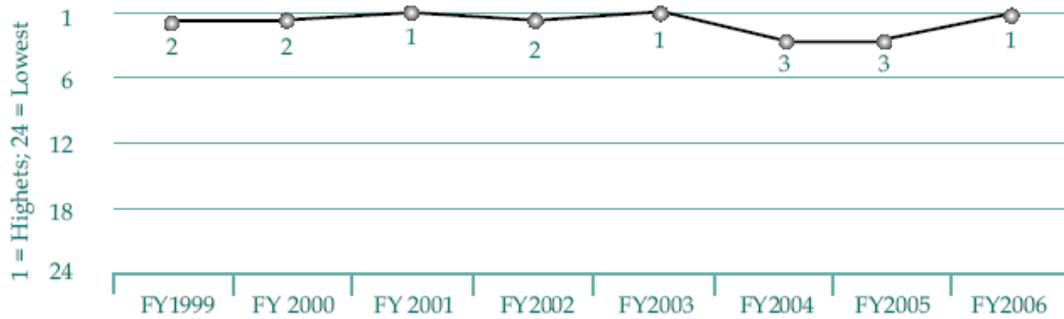
- The program has been generally successful in improving highway safety and maintaining mobility. Traffic-related fatalities per 100 million vehicle miles traveled have decreased from 1.51 in 2001 to an estimated 1.43 in 2005.
- The program does not have adequate measures to demonstrate improved efficiency or cost effectiveness. For example, the program does not measure project cost and schedule performance.¹¹ (However, State DOTs have voluntarily demonstrated initiatives to address this concern, as will be discussed in Chapter 4.)

As with all other program assessments in PART, the following actions form the basis of the improvement plan for the Highway Infrastructure program:

- Preparing a plan for improving program and project oversight of states.
- Directing more resources to comprehensive evaluation activities, particularly at the state project level.
- Devising efficiency measures to show that program delivery is cost-effective.¹²

In addition, outside assessments of the federal government's performance exist, through organizations such as OMB Watch and the Government Accountability Project at the Mercatus Center at George Mason University. It should be noted that the national transportation sector, as represented by the United States Department of Transportation (USDOT), has generally fared well since annual "Scorecards" were issued by the Mercatus Center in 1999. Based on primary criteria looking at transparency, public benefit, and "forward-looking leadership," **USDOT was ranked number one among all federal cabinet-level departments in FY 2006**, and had been ranked no lower than third since the study's inception (Figure 3). Based on GPRA-mandated performance reports, some of the evidence for USDOT's high score can be found in rich baseline and trend data, outcome-oriented goals and objectives, and clear disclosure of the "department's performance results, including shortfalls, in reader-friendly tables," among others.¹³

Figure 3. USDOT’s Ranking in the Government Accountability Project Scorecard



Source: Government Accountability Project. 2007. Mercatus Center at George Mason University

On the technical side, a number of data tools exist to continuously measure and monitor the highway system. In general, such tools have been developed at the national level intended for deployment at the state and local level. Reflective of the Federal-Aid Highway Program in which many of these data development and analyses tools are housed, a high degree of information coordination and compilation occurs between the different levels of government. For example, as discussed at length during the analysis of the recent I-35W bridge collapse in Minneapolis, the National Bridge Inventory¹⁴ information collected by FHWA is based on inspections performed by the State DOTs around the country.

In addition to management systems, other data tools used that comprise the existing performance-based FAHP framework include the following:

*Highway Performance Monitoring System (HPMS)*¹⁵. HPMS is a national-level highway information system that includes data on the extent, condition, performance, use, and operating characteristics of the Nation's highways. HPMS supports a data driven decision process within FHWA, USDOT, and Congress, and are used extensively in the analysis of highway system condition, performance, and investment needs that make up the biennial *Condition and Performance Report* to Congress. These reports are used by the Congress in establishing both authorization and appropriation legislation, activities that ultimately determine the scope and size of the Federal-Aid Highway Program. These data are also used for assessing changes in highway system performance brought about by implementing funded highway system improvement programs under GPRA, and for apportioning FAHP funds to individual states under authorizing legislations, thus incorporating elements of results-based budgeting.

*Intelligent Transportation System (ITS) Deployment Statistics*¹⁶. Based on the national ITS Deployment Tracking surveys conducted in 2004, 2005, and 2006 to agencies in metropolitan areas, the data gathered in the survey include information on the characteristics and extent of deployment of various ITS technologies and the status of interagency integration. (Table 2)

Table 2. Management and Operations: Traffic Operation/Management Center Functionality

Functionality	% Agencies Reporting Functionality	
	Arterial Management*	Freeway Management**
Incident management	64%	98%
Information dissemination to other agencies	61%	97%
Network or roadway surveillance and data collection	75%	91%
Special event traffic management	72%	86%
En-route driver information	41%	83%
Emergency services traffic control coordination	46%	72%
Evacuation management and traffic coordination	48%	68%
Road weather management	18%	47%
Network performance monitoring, evaluation, and reporting	44%	45%
Corridor management/traffic signal coordination or control	73%	33%
Environmental Monitoring	17%	34%
Ramp management and control	11%	24%
Lane management and control	8%	19%

* 170 Arterial Management agencies report operating TOC/TMC

** 102 Freeway Management agencies report operating TOC/TMC

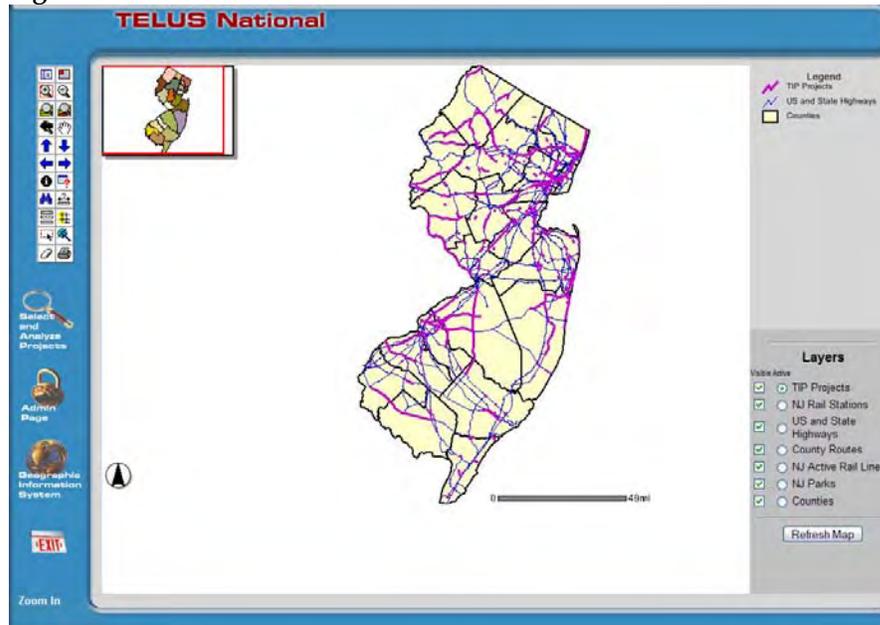
Source: ITS Deployment Statistics. ITS Joint Program Office. US Department of Transportation.

*Fatality Analysis Reporting System (FARS)*¹⁷. Containing data on a census of fatal traffic crashes within the 50 states, the District of Columbia, and Puerto Rico, FARS has been operational since 1975 and collects information on over 100 different coded data elements that characterize the crash, the vehicle, and the people involved. FARS data helps the National Highway Traffic Safety Administration (NHTSA) to better understand the characteristics of the environment, trafficway, vehicles, and persons involved in a crash.

*Highway Economic Requirements System (HERS)*¹⁸. HERS has been used by the Office of Legislation and Strategic Planning at FHWA for much of the past decade to develop future national-level highway investment levels, to either improve the nation's highway system or maintain user cost levels on the system. HERS provides cost estimates for achieving economically optimal program structures, and can predict system condition and user cost levels resulting from a given level of investment. These estimates provide benchmarks from which Congress considers the highway budget, along with other tools such as HPMS and others.

*Transportation, Economic & Land Use System (TELUS)*¹⁹. TELUS is a fully integrated information management and decision support system to help MPOs and State DOTs develop their transportation improvement programs and carry out other transportation planning responsibilities such as engaging public participation in the transportation planning process. TELUS aids MPOs and State DOTs in prioritizing projects and streamlining the transportation planning process by providing easy to use and storable data that can be manipulated for presentation to the public and the decision-makers. (Figure 4)

Figure 4. Screenshot of TELUS



Source: New Jersey Institute of Technology

Specific cases of how states have been implementing and monitoring some of the performance measurement tools describe above will be examined later in this report.

Setting the Future Direction

As performance measurement is an ongoing and continuously-refining process, one can always identify areas for further progress and improvements in any given area within the scope of FAHP, or any program or initiative for that matter. However, considering natural constraints on resources and given that State DOTs are already engaged extensively in performance management as discussed in chapter 3, the focus for future direction of a performance-based FAHP should be placed in the following areas:

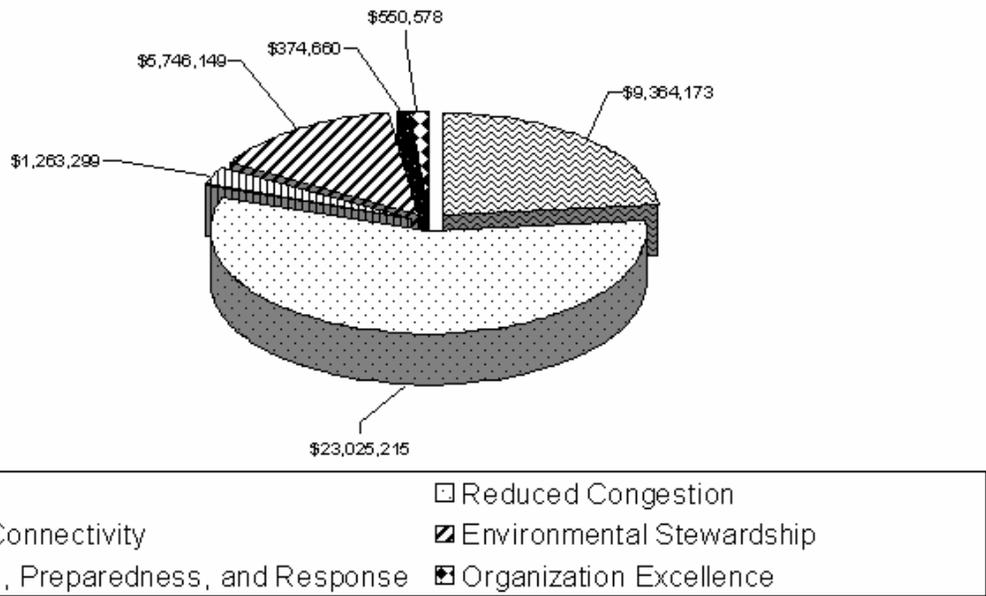
Recommendation 1: Strengthen Linkage Between Transportation and Economy

The critical role that transportation system plays in helping to maintain and improve the national economy cannot be underestimated and a number of illustrative examples abound. Today, 11.3 million Americans are employed in transportation occupations while the country's roads, railroads, airways, waterways and pipelines shipped 11 billion tons of freight valued at \$7 trillion. International trade has grown from the equivalent of 13 percent of the GDP in 1990 to 24 percent in 2002. The amount of freight transported on the national network is expected to double in the next 20 years, increasing performance pressure on the transportation system as concepts such as just-in-time deliveries and overnight freight become standard practice. Travel and tourism is the number-one industry in several states and in the top three in almost every state, generating \$580 billion in 2000.²⁰ Indeed, like the circulatory system, the condition and

performance of the transportation network has direct impact on the health of the national economy.

In the current federal budgeting process discussed earlier, there is a notable absence of any focus on economic performance. Because of this, the transportation system’s significant impact to national economic performance goes unmeasured. For example, the annual appropriation process does not explicitly link desirable national goals such as increasing economic competitiveness and providing jobs for all Americans with the performance of transportation investments that can generate 47,500 jobs for each billion dollars of highway or transit spending.²¹ At the agency level, however, a model for successful integration of performance-based budgeting and programs can be found in FHWA’s *Budget Estimates for FY 2008*. By integrating strategic and performance goals (e.g., safety, reduce congestion, global connectivity, environmental stewardship, etc.) with program activities (e.g., National Highway System, Interstate Maintenance, Bridge Program, etc.), FHWA’s budget clearly illustrates (Figure 5) the relationship between funding and outcome. For example, for FY 2008, \$832 million of the National Highway System funds have been dedicated to meet the goal of reducing urban congestion, as part of \$23 billion in congestion reduction-related spending.²² Broader application of performance-based budgeting could examine the impact of the federal motor fuel tax rates with macroeconomic indicators such as the Gross Domestic Product (GDP) and the Consumer Price Index (CPI) to optimize the level of transportation funding needed to maximize national economic performance.

Figure 5. FHWA Funding Distribution by Goal (in Thousands of Dollars)



Source: Budget Estimates for FY 2008. Federal Highway Administration. US Department of Transportation.

In addition, the growing importance of freight and its impact on the nation’s surface transportation network receives inadequate consideration in the federal budgeting process. Federal funding priority should be given to significant supply-chain

bottlenecks at interchanges, gateways, intermodal connectors, and international borders, as the value of imports has increased to an equivalent of over 25 percent of the GDP since the Interstate era was launched in 1956, and is expected to reach 60 percent of the GDP by 2030²³.

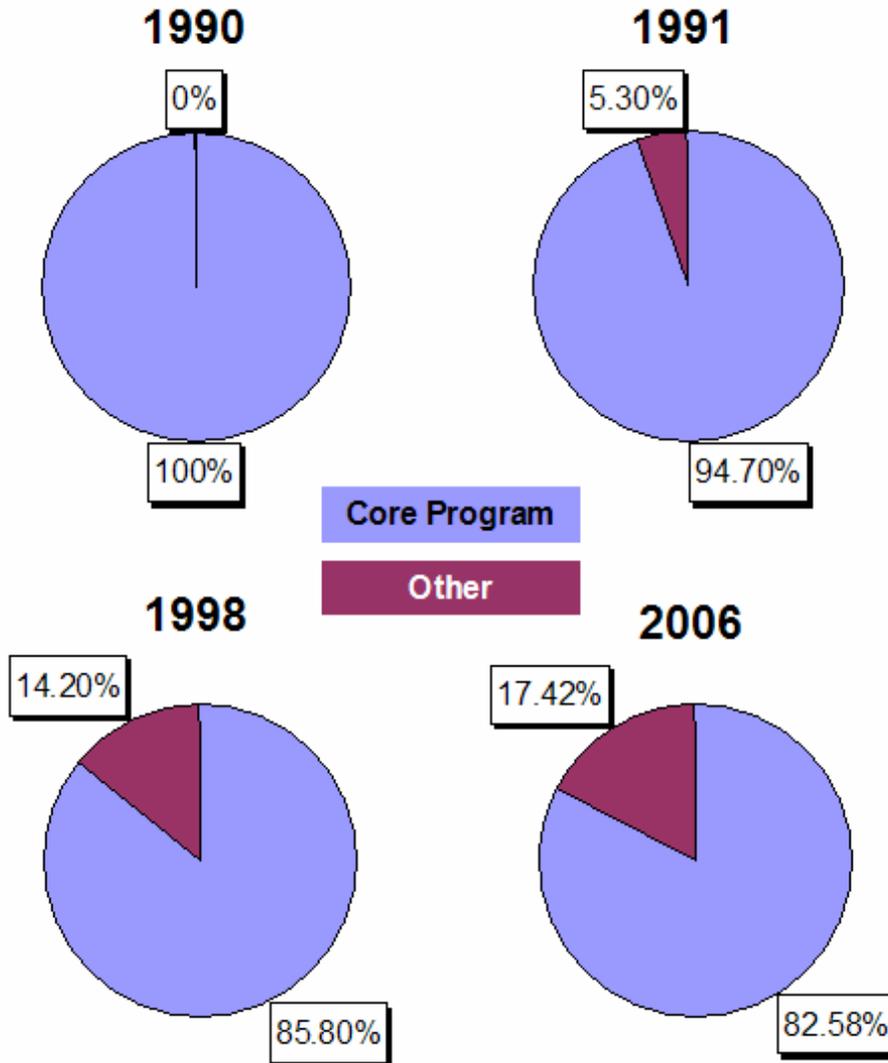
The role of transportation infrastructure in fostering economic development can be observed in a number of emerging economies around the world. In China, for example, the “government announced in 2005 that it planned to pave a further 85,000 kilometers, or 55,000 miles, of intercity highways and urban ring roads within 30 years at a cost of \$250 billion. The total length of all the highways is expected to overtake that of the American interstate system, the world's biggest, in around 2020.”²⁴ Tellingly, China’s economy grew at a staggering rate of 9.5 percent in 2004. Indeed, “America is more of a follower and no longer a world leader when it comes to infrastructure...Other countries marshal vanguard strategies...Japan has 2,000 kilometers of high-speed rail and is building about 300 more kilometers by 202. China is planning to build more than 2,500 kilometers of high-speed rail by 202. Europe has over 4,000 kilometers of high-speed rail and is planning to build 900 more by 2020. The United States has about 300 kilometers, but is building none.”²⁵ While China’s fixed asset investment levels of 45 percent in 2004 are not a departure from developing countries’ tendency to derive a substantial portion of their growth from new investment, the United States, in comparison, invests only 15 percent of the GDP in fixed assets such as transportation infrastructure.²⁶

Recommendation 2: Increase Overall Transportation Funding and Increasing Share of Core Programs

To keep the United States competitive in the global economy, surface transportation investment must be substantially increased over the next two decades and beyond, not only for highway and transit, but also for freight, as noted earlier, and passenger rail. Based on USDOT’s *Conditions and Performance Report*, adjusted for inflation, the total highway and transit capital investment needed to “maintain” (maintaining the current level of transportation system condition and performance) is expected to grow to \$259 billion by 2030. Assuming the historic split between the federal and state/local share of surface transportation capital costs is maintained at 45 percent and 55 percent, respectively, the federal funding requirement will grow to about \$117 billion in 2030.²⁷

While finding the resources to increase funding for transportation investments is important, it is equally critical to acknowledge the driving role of “core” FAHP programs in prioritizing needed investments. As seen in Figure 5, the share of federal funding devoted to core programs (National Highway System, Interstate Maintenance, Surface Transportation Program, Bridge Program, Congestion Management and Air Quality Improvement Program, Highway Safety Improvement Program, and Equity Bonus) has steadily declined as a proportion of total FAHP authorizations.

Figure 6. Percentage of Total Funding Available for "Core*" Highway Programs
 *Does not include funds above the line earmarks.



Source: Surface Transportation Policy Recommendations, American Association of State Highway and Transportation Officials.

This declining share of core highway programs increasingly adds obstacles to the statewide and metropolitan transportation planning process, as it reduces the funds that are systematically programmed by states and local governments that tend to be in the best position to determine taxpayer priorities (Table 3). In fact, there is clear Congressional intent for linkage between transportation plans and project programming, which require consistency between the program of projects and the long-range transportation plans. The principle of ISTEA in transferring decision-making power over the programming of highway and transit investments to the state and MPO levels through a systematic planning process should be preserved by flowing funds to states through programs with broad eligibilities, with most project selection based on the transportation planning process rather than Congressional earmarking.²⁸

Emphasizing the core-programs tends to best link the broad, national-level transportation vision and goals with the needs and conditions at the state/local level. This cannot be achieved through implementation of a collection of earmarked projects that tend to lack coherence with the already-established state/local capital program priorities as seen in every Long Range Transportation Plan (LRTP) and Statewide Transportation Improvement Program (STIP). A simplified program structure with a reduced number of program categories and broadening the rules on project eligibility and fund flexibility will allow states to focus greater resources on their most critical needs.

Table 3. Apportionment Formulas for FHWA Core Components of FAHP

PROGRAM	FACTORS	WEIGHT	MINIMUM APPORTIONMENT
Interstate Maintenance	Interstate System lane miles open to traffic	33-1/3%	1/2 percent of Interstate Maintenance and National Highway System
	Vehicle miles traveled on Interstate System routes open to traffic	33-1/3%	
	Annual contributions to the Highway Account of the Highway Trust Fund attributable to commercial vehicles	33-1/3%	
National Highway System	Lane miles on principal arterial routes (excluding the Interstate System)	25%	1/2 percent of Interstate Maintenance and National Highway System apportionments combined
	Vehicle miles traveled on principal arterial routes (excluding the Interstate System)	35%	
	Diesel fuel used on highways	30%	
	Total lane miles on principal arterial highways divided by the state's total population	10%	
Surface Transportation	Total lane miles of Federal-aid highways	25%	1/2 percent
	Total vehicle miles traveled on Federal-aid highways	40%	
	Estimated tax payments attributable to highway users paid into the Highway Account of the Highway Trust Fund	35%	
Highway Bridge Replacement and Rehabilitation	Relative share of total cost to repair or replace deficient highway bridges	100%	1/4 percent (10 percent maximum)
Congestion Mitigation and Air Quality Improvement	Weighted non-attainment and maintenance area population	100%	1/2 percent
Highway Safety Improvement	Total lane miles of Federal-aid highways	33-1/3%	1/2 percent

	Total vehicle miles traveled on Federal-aid highways	33-1/3%	
	Number of fatalities on the Federal-aid system (the National Highway System)	33-1/3%	
Metropolitan Planning	Urbanized area population ²	100%	1/2 percent
Equity Bonus	Each state's share of High Priority Project funding and apportionments for Interstate Maintenance, National Highway System, Surface Transportation, Bridge, Congestion Mitigation and Air Quality Improvement, Highway Safety Improvement, Safe Routes to School, Railway-Highway Crossings, Coordinated Border Infrastructure, Recreational Trails, Metropolitan Planning, Appalachian Development Highway System, and the Equity Bonus programs must be at least a specified share (90.5% for FYs 2005-2006, 91.5% for FY 2007, and 92% for FYs 2008-2009) of its estimated payments into the Highway Account of the Highway Trust Fund, or, for certain states, no less than the share of apportionments and High Priority Project funding it received under TEA-21, except that no state may receive an amount less than a specified percentage (117%, 118%, 119%, 120%, 121% for FYs 2005-2009, respectively) of the average annual amount it received in apportionments and High Priority Projects under TEA-21.	100%	None

Financing Federal-Aid Highways. *Federal Highway Administration. US Department of Transportation.*

Recommendation 3: Restructure Federal Safety Programs to Better Integrate Performance Measures

As demonstrated in its name, SAFETEA-LU placed great emphasis on improving the safety of the nation’s transportation system. The legislation raised the stature of the highway safety program by establishing highway safety improvement as a core program tied to strategic safety planning and performance, which aimed at reducing both the rate and actual number of driving-related fatalities. This has resulted in a record-low

number of people killed in the United States in motor vehicle traffic crashes (42,642) in 2006, which saw the largest decline in terms of both number and percentage of motor vehicle-related fatalities since 1992.²⁹ In SAFETEA-LU, the \$5.1 billion (from FY 2006 to FY2009) Highway Safety Improvement Program (HSIP) provides flexibility to allow states to target funds to their most critical safety needs, and is distributed by formula based on each state's lane miles, vehicle miles traveled, and number of fatalities, after set-asides for other safety-related programs.

HSIP requires states to develop and implement a Strategic Highway Safety Plan (SHSP) and submit annual reports to the Secretary of Transportation that describe at least five percent of their most hazardous locations, progress in implementing highway safety improvement projects, and their effectiveness in reducing fatalities and injuries. Integration of a performance-based approach to highway safety can be found in the federally-mandated SHSP, which identifies and analyzes highway safety problems and opportunities, includes projects or strategies to address them, and evaluates the accuracy of data and the priority of proposed improvements. SHSP is required to be based on accurate and timely safety data, consultation with safety stakeholders, and performance-based goals that address infrastructure and behavioral safety problems on all public roads. Furthermore, states are also required to develop an evaluation process to assess results and use the information to set priorities for highway safety improvements.

Building on this progress, continued restructuring of safety program funding by USDOT could further orient FAHP to improve safety-related outcomes. One way to accomplish this would be to restructure multiple federal safety funds from the National Highway Traffic Safety Administration (NHTSA) and the Federal Motor Carrier Safety Administration (FMCSA) into a consolidated funding pot based on performance tiers. Under NHTSA's State and Community Highway Safety Grants program (Section 402), a state is eligible for these formula grants by submitting a performance plan that establishes goals and performance measures to improve highway safety in the state and a Highway Safety Plan that describes activities to achieve those goals.³⁰ Other similar programs administered by NHTSA include Safety Belt Performance Grants (Section 406), Occupant Protection Incentive Grants (Section 405), and Alcohol-Impaired Driving Countermeasures Incentive Grants (Section 410), among others. Instead of directing federal highway traffic safety funds through such discrete programs with separate federal requirements, consolidating these incentive-based programs into a single, flexible funding source can help improve program delivery at the state/local level by strengthening the relationship between funding and outcome. Such restructuring should be tied to the use of performance-based tiers to reward states that meet or exceed safety performance goals with increased federal funding while recognizing the varying challenges and needs faced by each state.

Similarly, FMCSA's Motor Carrier Safety Assistance Program (MCSAP), a federal grant program that provides financial assistance to states to reduce the number and severity of crashes and hazardous materials incidents involving commercial motor vehicles (CMV), could be restructured through consolidation of funds into single apportionments to help

meet the program's goal of reducing CMV-involved crashes, fatalities, and injuries through consistent, uniform, and effective CMV safety programs. Such an approach can increase the efficiency of federal funds by investing grant monies in outcome-based safety programs to increase the likelihood that safety defects, driver deficiencies, and unsafe motor carrier practices are detected and corrected before they become contributing factors to crashes.³¹

These kinds of increased funding flexibility in the safety program should allow states to focus resources on high-priority, high-accident, lower-functional class roadways as well as on non-motorized highway safety issues.

Chapter 3: STATE PERFORMANCE-BASED MANAGEMENT PROGRAMS

Overview of Performance Management

State and local transportation agencies have been using performance measures for many years. During the 1970s and 1980s, the development of pavement and bridge management systems led to the widespread use of facility condition indicators. A number of states such as Ohio, Pennsylvania, Wisconsin, and Washington developed maintenance management systems that defined performance indicators for a range of maintenance and operations activities as well. During this same period, virtually all states reported a variety of “output” measures that reflected the scope and scale of the programs being implemented. In the late 1980s and early 1990s, it began to be recognized that broader performance measurement, focusing more on the “outcomes” of government programs, was needed. In 1989, Oregon established a Progress Board that defined performance benchmarks for all government agencies, including transportation, and other states such as Florida, Utah, and Minnesota followed with similar efforts. During the same timeframe, many local governments and their national associations embraced the use of performance measures.

By the mid 1990s, a number of State Departments of Transportation (State DOTs), metropolitan planning organizations (MPO), and other transportation agencies were beginning to develop and implement more comprehensive approaches to performance measurement. Often these efforts initially focused on a specific function (e.g., long-range planning, project delivery, operations, etc.) or program area (e.g., preservation, safety, maintenance, etc.) and then expanded. Over the past ten years, as the financial resources available for transportation have become more constrained and the call for more accountability and transparency in government programs has increased, more and more states have implemented or expanded performance management programs.

The trend toward more comprehensive performance management is easy to observe in the programs of three national conferences on transportation performance measurement that have been organized since 2000. From an initial focus on providing guidance on the basic concepts of performance measurement and early implementation results, there is now a wealth of experience with increasingly comprehensive performance management. Many states, including Maryland, Virginia, Florida, Missouri, New Mexico and Washington; and MPOs, including those in San Francisco, Dallas, Atlanta, and Los Angeles develop quarterly or annual performance reports. Agency web sites are used to provide access to a wide range of performance information. The CitiStats program, pioneered by the New York City Police Department, involving executive review of agency performance in public forums, has been extended to transportation agencies in a

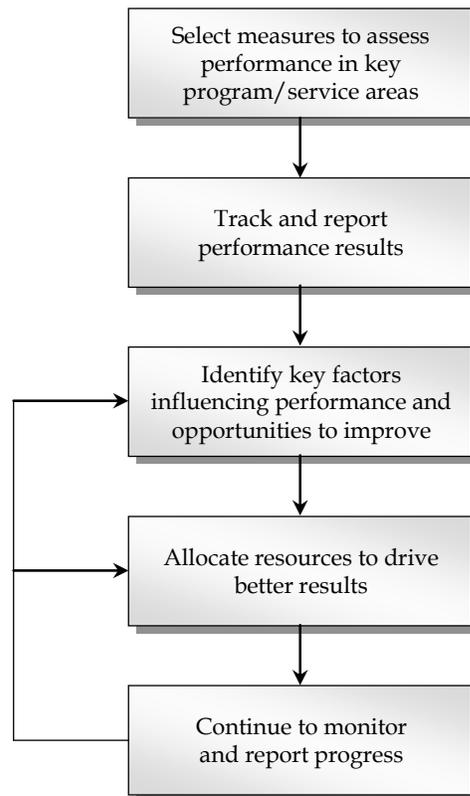
number of cities and states. Performance results are not just reported but are influencing resource allocation and budget decisions.

As a result of the increasing focus on performance over the past few years, comprehensive performance management now is widely embraced as a best business practice in the transportation community. The figure illustrates the key steps in performance management. At the heart of comprehensive performance management is the discipline to:

- Select appropriate performance measures to assess agency performance in critical program and service areas;
- Track and report actual performance results;
- Analyze results to identify key factors influencing performance and opportunities for improvement;
- Allocate resources and operate transportation systems to drive better results; and
- Continue to monitor and report progress.

Increasingly, it is recognized that these steps can be applied to all of the functions and operations of a transportation agency. It also is recognized by organizations that have adopted a performance management approach that the specific strategy must be tailored to each organization, that progress and improvements occur incrementally over time and that full implementation takes sustained leadership over a number of years.

Performance Management Process



Comprehensive Transportation Performance Management

Adopting a comprehensive approach to performance management requires integrating the basic principles of performance management into all of the critical functions of a transportation agency from planning to delivery to operations. These functions include:

Policy Development and Long-Range Planning. At this stage of the transportation planning and development process, performance measures can help to translate broad policy goals and objectives into more actionable programs, policies, projects, and services when combined with broad public outreach and involvement, and a number of cycles of technical analysis and strategy evaluation. Both federal law and planning regulations appropriately require that the goals and objectives for transportation plans be developed in cooperation and coordination with a wide range of agencies and stakeholders, including elected officials, business and transportation interest groups, the media, and the general public. As a result, the goals, objectives, and performance measures in a particular state or region will reflect the results of this process and the priorities of that community.

Programming and Budgeting. A key element of comprehensive performance management is to use performance results to help to drive better performance in the future. To achieve this objective requires that performance results in critical program and service areas be tracked and analyzed to identify both the factors that influence performance and opportunities for improvement. Armed with that information, the programming and budgeting process can be used to direct resources and effort where the potential for improved performance is greatest and most important to stakeholders.

Program, Project, and Service Delivery. Many transportation agencies' first efforts at performance management have been directed at project and service delivery. Measuring an agency's performance in delivering projects on budget and on schedule is critical to establishing credibility and accountability. Twenty states participated in a peer effort to compare results in construction project delivery cost and schedule management and define best practice. Service delivery areas that have been the focus of performance measurement efforts include the issuance of permits and licenses, rest area maintenance, and response to customer complaints.

System Operations. Managing the real-time operation of the transportation system is a critical priority in virtually every state and metropolitan region in the country. The renewed focus on congestion and safety require a system operations element in any performance management program. In addition to measuring traffic conditions, delay, and other service parameters in key corridors or regions, many states are measuring their effectiveness in a wide range of services that affect system operation, including snow and ice removal, clearance time for incidents, and work zone delay and safety.

Monitoring and Reporting Results. Tracking and reporting performance results creates the opportunity to learn about the factors that affect performance, identify opportunities for improvement, and examine comparative performance results from peer agencies to identify best practice. Depending on the performance results achieved, adjustments may be made in the policy and long-range planning process, resource allocation, delivery, and operations.

Many states have adopted a comprehensive performance management approach involving all of the functions described above. Many others are in the process of

introducing performance management into selected functions as a first step. Profiles of a few of these efforts are included later in this section. For states that have adopted performance management approaches, the key benefits include:

- Improved system and organizational performance;
- Greater results for the resources available and fewer investments with low performance benefits;
- Strengthened accountability with elected officials and stakeholder groups; and
- Improved communication with the full range of stakeholders.

Relationship to Federal Planning Requirements

The trend toward states adopting comprehensive performance management approaches has been the result of a range of factors, including the demand for more accountability from government programs and agencies, the pressure of scarce financial resources, and the recognition of a best business practice. However, federal planning requirements also have played a role in supporting and encouraging performance-based approaches. The original ISTEA requirement for management systems encouraged a performance management approach, and the state and metropolitan planning factors define potential performance areas that must be considered. More recently, the SAFETEA-LU requirements for a Congestion Management Process and Strategic Highway Safety Plans discussed in Chapter 2 encourage consideration of performance measures and performance goals for key emphasis areas. The increasing emphasis on asset management also reinforces the concept of comprehensive performance management.

As mentioned earlier, federal planning regulations also require that any statewide or regional transportation goals, policies, and plans be developed with a process that engages the full range of partners and stakeholders. SAFETEA-LU further expanded the list of partners and stakeholders that must be included. Appropriately, as a result of this process, performance goals and objectives must reflect local, regional, and statewide concerns and priorities that will vary from state to state and region to region. Effective performance management approaches must be tailored to reflect these local issues and concerns.

Comparative Performance Measurement and Peer Groups

Most agencies are comfortable with comparing performance results within their own organizations. Tracking on-time contract completion for the current year against the past four years does have value. However, the improvement possibilities may be limited to incremental process changes common to internal comparisons. Careful comparison of performance results across agencies can be a useful source of information on best practices and help focus efforts to improve performance over time. However, data limitations and varying approaches to managing services and tracking performance make agency to agency comparisons difficult.

State DOT leaders work with their counterparts in other states to improve business processes by identifying best practices and innovations. A subcommittee of AASHTO's

Standing Committee on Quality began working in 2005 on a prototype to analyze and compare states' on-time and on-budget performance of construction contracts. The 20-state voluntary group chose construction contracts for the prototype because most transportation agencies define the construction phase of project delivery in similar terms and already collect good data on costs and schedules. Where applicable, the prototype used AASHTO's TRNS*PORT software suite, which is a comprehensive construction contract management tool used by several State DOTs. More than 26,500 projects completed from 2001 to 2005 were analyzed.

While most projects (81 percent) were completed within a 10 percent cushion of the original award amount, larger projects over \$5 million did not perform as well (70 percent). Larger projects also were less likely to be completed on time with just 35 percent being built within the original schedule. More importantly, a common cause was identified. Surprises during construction such as unexpected subsurface conditions, utility problems, or environmental issues were most frequently to blame for higher project costs and scheduling delays. Project surprises are inevitable, but the ability of some State DOTs to anticipate surprises, or at least limit their impact on cost and schedule, led to better performance. The study found that strong performing State DOTs had specific strategies to foster accountability for cost and schedule, monitor causes of problems to identify common culprits, create incentives for staff and contractors, and strengthen connections between preconstruction and construction work phases. By analyzing and comparing results among this peer group, 28 best practices from nine different states were identified.

Confidence in the usefulness of this first effort has all 20 states already committed to the next round of analysis and comparison focusing on smooth pavements. More participation is expected as State DOT executives realize that a consistent analysis of performance results across states can be a powerful learning tool which can improve business processes and push innovation. The intent is to expand comparative measures to other performance areas in the future, although some areas may be more difficult to consistently measure across states. AASHTO and FHWA also have sponsored a number of peer exchanges, conferences, and scanning tours focused on various aspects of performance management. These efforts have also been focused on defining best practices and identifying areas requiring additional research.

While comparative performance measurement can be a very useful tool when used correctly, when comparative information is misused it can be misleading and counterproductive in terms of learning or identifying best practices. One size certainly does not fit all in terms of implementing best practices from comparative measurement efforts. A best practice at one State DOT may not be successful at another due to numerous factors, including differences in operating structure, legislative constraints, organizational culture, or even geography. Therefore to be of real value, best practices must be analyzed for proper organizational fit and appropriately customized to deliver the desired performance.

Limitations of Performance Management

While comprehensive performance management is now recognized as a best business practice, it alone will not guarantee that a desired or acceptable level of performance will be achieved. In some performance areas, such as congestion and safety, there are factors that influence performance that are not under the control of the transportation agency. Engaging a broader set of partners to define and drive shared performance objectives, such as the process envisioned for the development of Strategic Highway Safety Plans, may address some of this issue. More importantly, however, the total funding available for transportation will limit the performance that is possible to achieve even with a comprehensive performance process in place. If sufficient funding is not available, performance management does not make up the difference. What performance management can help to achieve is the best level of performance possible given the resources that are available. However, available resources must be spread across a range of performance areas, and performance management involves balancing performance and resources and making tradeoffs to reflect local priorities.

Recommendations

While most states are implementing performance-based management approaches, all states can further strengthen their performance management processes. It is important that federal legislation and regulations, and actions at the state level, encourage rapid deployment of comprehensive performance management covering all critical activities and functions of transportation agencies.

Creating a Pilot program to Delegate Federal highway Program to States in Exchange for Comprehensive State DOT Performance Management Processes

One of the boldest and innovative possibility is to create a pilot program that delegates the Federal-Aid Highway Program to states in exchange for development and implementation of comprehensive performance management processes in the pilot states. During reauthorization of TEA-21 that would eventually result in SAFETEA-LU, USDOT proposed Congressional adoption of a legislative section that would establish a surface transportation system performance pilot program. This pilot program was intended to test the concept of a performance-based management approach in the obligation of federal funding under FAHP. Under this pilot program open to all interested states, the participating states would be eligible to manage their programs on a systematic, performance basis across the programmatic lines by which the Federal-Aid program is normally structured. This pilot would have been devised in order to determine the feasibility, effectiveness, and impacts of this approach on program design and management.

According to the USDOT, the benefit of such a program is that it would authorize the Secretary to assign, and a state to assume, some or all of the Secretary's responsibilities under any federal law or requirement, except for responsibilities relating to federally-recognized tribes. The state would be deemed to be a federal agency to the extent the state is carrying out the Secretary's responsibilities under the National Environmental

Policy Act, Title 23 of the United States Code, or any other federal law. A State DOT or other state agency carrying out a responsibility of the Secretary would be subject to federal laws to the same extent a federal agency would be subject. Additionally, when assuming the responsibilities of the Secretary, this section would require a state to certify that it has laws and regulations necessary to carry out the responsibilities assumed by the state, and laws and regulations that are comparable to the Freedom of Information Act and that are reviewable by a court of competent jurisdiction.

From its inception, the Federal-Aid Highway Program has fostered the development and growth of State DOTs by requiring them to have adequate powers and be suitably equipped and organized to be able to comply with all Federal-Aid requirements. In addition, many states have enacted legislation that is consistent with the requirements contained in Title 23. Thus, in some states, it may be desirable to eliminate federal controls that are duplicative to facilitate a more orderly and efficient execution of the Federal-Aid Highway Program. This program would test whether the state can deliver these projects, consistent with federal policies and objectives.

Under this program, a state would identify certain goals it wishes to achieve each year with its funds under the program as well as certain performance measures by which to gauge the state's success in achieving its goals. The goals and performance measures would be mutually established by both the state and the Secretary. Although this program is intended to provide a great deal of flexibility to the states in determining where and how to spend federal transportation funds, the Secretary will ensure that the state goals and priorities are aligned with any areas of national strategic importance. Further, pilot states would be required to submit certain information to enable the Secretary to judge the success of the pilot program. States would be able to use their own record-keeping systems with information on the location of the expenditures, improvement types, and functional systems. Each year, information concerning how well the states had done to achieve established targets would be submitted by the pilot states, including a summary of progress in national interest areas, to be evaluated by the Secretary.

In addition, a number of other recommended federal and state actions are provided below.

Recommendations for Federal Government

Encourage performance management through Research and Development (R&D). Encourage State DOT performance management processes through R&D in hard to measure areas such as freight, economy, and environment; and sponsor peer exchanges, workshops, and other activities aimed at developing and sharing best practices.

Create incentive programs to optimize resource allocation. Create incentive programs for states to modify laws and regulations that restrict more performance-based resource allocation such as restrictions on the use of revenues and earmarks.

Recommendations for AASHTO and State DOTs

Explore and streamline state funding allocation rules and practices. Conduct a survey of state funding allocation rules and practices and other barriers to comprehensive performance management at the state level and work with the National Conference of State Legislatures (NCSL) to develop specific strategies to reduce these barriers.

Share best practices and expand comparative performance measurement. Continue to support and sponsor efforts to make greater use of comparative performance measurement to improve service delivery and system performance by sharing best practices and develop a specific work program, including the measurement areas and timeline, for expanding comparative performance measurement.

Recognize leading states that utilize comprehensive performance management programs. Establish a program to recognize states that have implemented comprehensive performance management programs and can demonstrate the use of performance data in funding and management decision-making processes. Such a program might be similar to the recognition given to best practice examples in planning, environment, and other areas.

Continue to provide robust technical assistance. Continue to sponsor targeted peer exchanges, workshops, and scanning tours aimed at increasing the application of performance management practices and publish performance data that communicates the impact of such programs. This includes recommending, and tracking the results of, research and technical assistance programs through NCHRP, SHRP II, and other programs to improve the data, management systems, and organizational capabilities required to successfully implement comprehensive performance management approaches.

Develop programs to help modernize organizational culture. Develop material and educational programs that specifically target agency mid-management levels to overcome resistance and support cultural change. This should include providing compelling examples that demonstrate the value and effectiveness of performance based program management and resource allocation.

Chapter 4: IMPLEMENTATION RESULTS AT SELECT STATE DOTs

All State DOTs are using performance measures to some extent, and some states have moved to a more holistic approach to performance management. However, there is no one standard approach to performance management that is appropriate for all states. The resources available; unique geographic, demographic, political and economic factors; and local policy directions all influence the level of performance that is desired and that can be achieved. Though no “one-size-fits-all” approach to performance management is appropriate, every state can make further progress in strengthening their performance management processes and driving better results in critical areas. AASHTO, FHWA and individual states have sponsored or been involved in a wide variety of efforts to share experiences and results in performance management through peer exchanges, conferences, workshops, scanning tours and other activities. The following profiles summarize the experience of 11 states in implementing performance management approaches.

FLORIDA

The Florida Department of Transportation (FDOT) has a long history of using performance measures and has been regarded as a national leader in this area for several years. FDOT is primarily responsible for 12,000 centerline highway miles, including 6,200 bridges that carry two-thirds of all traffic on Florida’s public roads. Ensuring the safety and mobility of people and goods on these facilities, while enhancing economic prosperity and preserving the quality of the environment and communities, are paramount to the mission of the Department. To achieve this, Florida has developed an asset management process that is:

Policy-Driven:

- Strong statutory policy framework; and
- Preservation/capacity program tradeoffs made at the policy level.

Supported by Data:

- Management Systems; and
- Performance-based programming and budgeting.

Systematic Approach to Decision-Making:

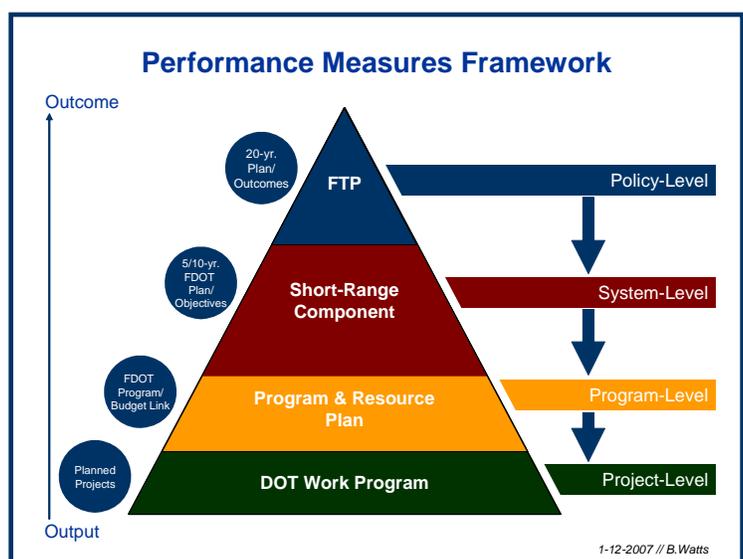
- Continuous cycle approach, including evaluation and feedback.

The Framework

The accompanying graphic illustrates the Performance Measures Framework in which FDOT operates, measures its performance, and measures performance of the transportation system.

The Florida Transportation Plan sets long-range goals and objectives for at least 20 years to guide transportation decisions in Florida. It provides the policy direction and desired outcomes for Florida’s transportation system.

The Department establishes quantifiable short-term (up to 10 years) objectives for meeting its responsibilities for implementing the Florida Transportation Plan in the *Short-Range Component of the Florida Transportation Plan*. The Short-Range Component is updated annually and



serves as the FDOT's annual performance report. It documents the Department's objectives and strategies, specifies how those objectives are being met, and provides policy guidance for development of the FDOT work program and budget.

Each year, FDOT also develops a 10-year Program and Resource Plan to establish financial and production targets for state transportation programs. It guides program and funding decisions to carry out the goals and objectives of both the Florida Transportation Plan and the Short-Range Component. This plan essentially links the FDOT long-range transportation planning process to the annual budget and Work Program. The Work Program is a five-year listing of all transportation projects planned for each fiscal year, adjusted for the legislatively approved budget for the first year.

Systematic Measurement and Monitoring

Key Performance Measures are monitored on a monthly basis by the FDOT Executive Board. New measures are established when needed and existing measures are validated periodically. Program offices are responsible for establishing key performance measures and submeasures used to achieve organizational improvements. The current key performance measures fall into five categories: Transportation System Safety, Customer and Market Focus, Production Performance, Transportation System Performance, and Organizational Performance.

Additionally, each office/program within FDOT has developed performance measures and monitors performance on an ongoing and continuous basis using PBviews Performance Measurement System, a performance measurement database. All FDOT performance measures and data are available for viewing and analysis using this internal system.

The system displays monthly, quarterly, and annual information about the selected measures in a variety of ways. From raw data for each input item, to trend charts and graphs showing actual versus target measures or year-to-year comparisons, the system can show the smallest detail or the "big picture" about any selected measure. The goal is to provide information and basic analysis for management at all levels to use in monitoring and tracking the key measures of the Department.

How We Are Being Measured By Others

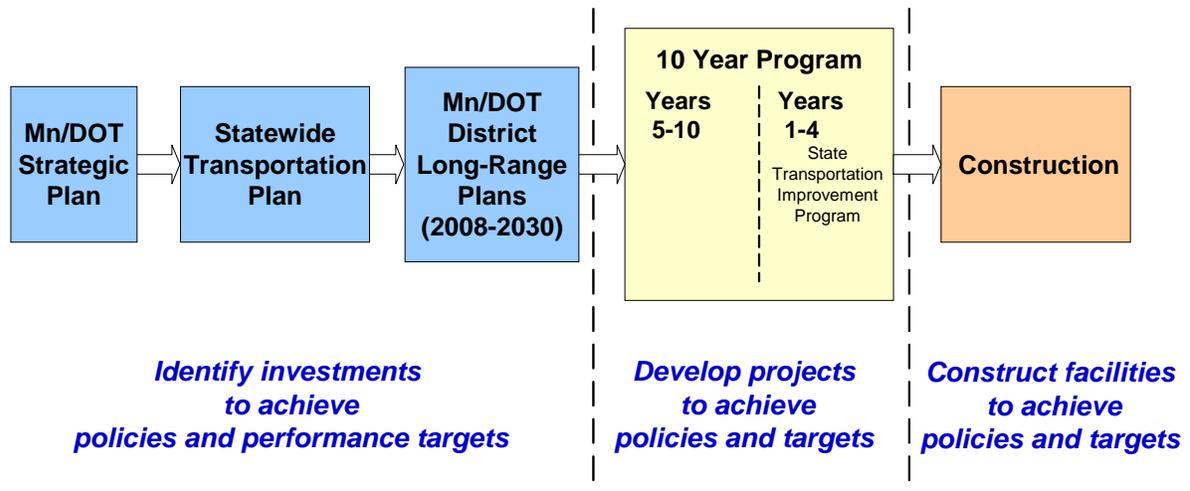
The Florida Transportation Commission is an independent oversight entity that provides leadership and policy reviews and recommendations to maintain public accountability for the Department. The Florida Transportation Commission is required by law to monitor, on at least a quarterly basis, the efficiency, productivity, and management of the Department using performance and production standards developed by the Commission. These standards include production, finance and administration, preservation and safety of the state system, highway and public transportation capacity improvements, and disadvantaged and minority business programs.

In addition to the Transportation Commission, the Governor’s Office uses their Long-Range Program Plan (LRPP) to provide the framework and justification for agency budgets by linking agency budgets and accountability structure. The LRPPs are goal-based plans with a five-year planning horizon utilizing legislatively approved performance measures and standards.

MINNESOTA

Minnesota DOT (Mn/DOT) has been engaged in developing performance management tools since the early 1990s, and now has a system that spans most of its products and services and strategic priorities. With Mn/DOT’s performance-based planning system – clear policy priorities, performance trend data, and performance forecasts are used to guide development of the capital program and many operational decisions. The figure illustrates this process for the highway construction program.

MN/DOT’s Performance-Based Planning Process for the Highway Construction Program



Mn/DOT’s eight districts are expected to manage resources to achieve performance targets for the Department’s highest priorities – such as pavement and bridge preservation, safety, and snow and ice removal. They are expected to manage to performance targets for a full range of transportation services and assets.

Regular face-to-face performance reports to executive management and districts, at least quarterly, provide accountability and are a forum for policy review and problem-solving.

Scope

Key elements of the performance-based system include (with some specific examples):

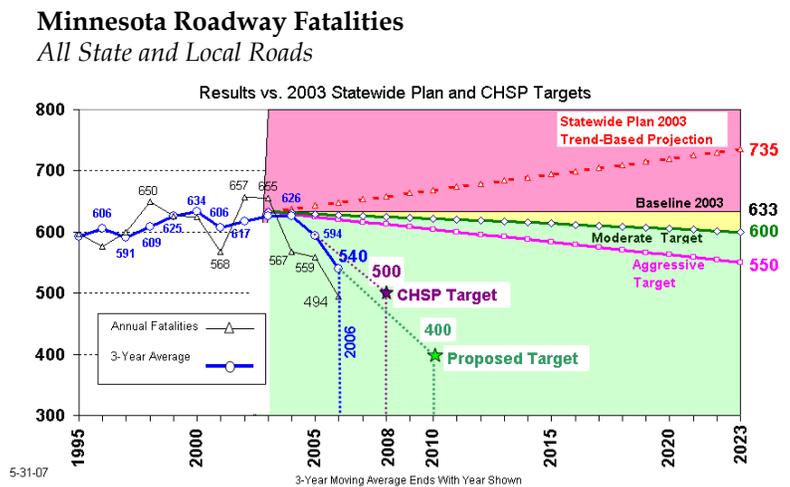
- Twenty-year transportation plan, 10-year work plan, and 4-year capital program;
- Asset preservation – pavements, bridges, airport runways, and bus and truck fleets are managed to meet targets and reduce life-cycle costs;
- Highway System Operations Plan – includes preservation, mobility, safety measures;
- Freight Plan and Aviation System Plan – measures tied to policies;
- Biennial budget process;
- Program and project delivery – monitoring of on-time, on-budget variation;
- Process improvement and best practices – reduced right-of-way and EIS processing time;
- Administrative Support – IT projects on-time and on-budget; and
- Customer research monitors satisfaction and helps set some performance targets.

Results – Transportation System and Customers

As resources have tightened, benefit/cost and performance evaluation of options allow Mn/DOT to shift resources to projects and services with the best results for the dollars invested.

Some examples of recent performance results achieved in Minnesota are:

- **Highway fatalities** have fallen for four straight years and are at the lowest level since 1945 – as a result of aggressive performance targets, new strategies, and a Toward Zero Death program partnering with Local governments and others.
- **Congested miles** on the Twin Cities urban freeway system have been reduced for three years straight, from 22.9 percent in 2003 to 20.6 percent in 2006.



- **Snow and Ice Removal** – State performance targets for average hours to clear roadways after snowstorms have been met consistently since 2000.
- **Bridges** – State bridges in Fair or Poor condition were reduced from 14.0 percent in 2003 to 11.3 percent in 2006.
- **Construction Project Delivery** – From 2000 to 2005, construction of 94 percent of all major projects was completed on schedule.
- **Customer Satisfaction** exceeds targets for Snow and Ice, Signing, Pavement Markings, and Rest Areas.

With intense competition for limited resources, results in some areas, such as pavement condition, fell below targets in the early part of the decade. A concerted effort to redirect the capital program has started to reverse that trend.

To manage the capital budget, department and district executives meet twice a year to review the actual and predicted results of their 4- and 10-year program against statewide performance targets for safety, smooth pavements, bridge preservation, and travel speeds. Each prepares a performance-based scenario that identifies total resource needs to meet performance targets, and a fiscally constrained scenario that sets forth projects to be built with available revenues.

Institution of this performance-based approach has helped achieve a major increase in preservation investment since 2003. Resource gaps between the two scenarios are reviewed with the state legislature. Having a consistent system for defining needs has enhanced legislative funding deliberations and public dialogue.

WASHINGTON

Increasing Transparency and Accountability

At the Washington Department of Transportation (WSDOT), performance-oriented data collection and analysis began with a series of legislative mandates in 1990 and was significantly expanded in 2001 with the adoption of a comprehensive accountability program that includes frequent reporting of system and agency performance in the quarterly publication *Measures, Markers, and Mileposts*, also referred to as “The Gray Notebook” (GNB). WSDOT’s performance management approach is integrated and holistic. It encompasses policy development, long-range planning, strategic and business planning, performance-based programming and investment decision-making. For example, WSDOT’s asset management program for many years has used performance data to allocate limited resources resulting in 97% of bridges and 93% of pavements being in good or better condition. Performance measures also provide guidance for project delivery, system management and operations. Annually, the

agency uses over 100 specific performance metrics that cover all key agency functions, programs, and multiple modes. Performance measurement has long become an important core management tool at WSDOT – the motto used often is, “What gets measured, gets managed.”

Communicating Performance Results

Effective communication of result is as critical as the measurement itself. WSDOT created a method it calls “Performance Journalism” that combines clear narrative and storytelling with visual graphs and data to provide an accurate assessment of activities to the widest possible audience. WSDOT makes extensive use of its web site and the GNB is distributed both in hard copy and electronically to a broad audience of 2,000 to 3,000 subscribers. A web-based subject index allows access to every performance result ever published. In addition, the agency uses folios, special reports, and other media and communication tools that are all based on consistent and high-quality reporting.

Making a Case for Funding

The largest impact of using and reporting on performance measurement has been the increased confidence of the Governor, Legislature, and the public. In April of 2001, the agency lacked public confidence and credibility and faced negative media. Following WSDOT’s GNB release, the Puget Sound Business Journal published in the fall of the same year wrote: “Accountability builds trust and candor, removes mysteries; (the Gray Notebook) is as addictive in the same manner as a copy of The World Almanac.”

Communicating Performance to External Audiences: Project Delivery

In 2003, the Washington Legislature passed a five-cent gas tax to fund \$4.5 billion in long-overdue transportation projects. Within weeks of the Legislature adjourning, WSDOT began reporting on the first of these projects’ performance. WSDOT’s “no surprises” reporting described the agency’s successes and challenges on a quarterly basis in delivering projects to the public, whose gas taxes funded these projects. As a result of this transparency and the agency’s strong record in project delivery, the 2005 Legislature appropriated \$8.5 billion to fund an additional 274 projects. In their proposal to fund these projects, legislators pointed out that the agency’s “sharp focus on accountability and efficiency” provided their members and the public with the confidence that the agency was fulfilling the expectations of the 2003 funding package, and could deliver the additional projects funded in their proposal. The funding package subsequently passed, and also withstood a voter initiative to repeal the 2005 gas tax. This was the first time that a voter initiative for a tax decrease failed.

“No surprises” reporting also has yielded positive results when projects are facing delivery challenges. Washington State has experienced the same difficulties faced by other states due to rising construction material and labor costs and a shrinking bidding market. While WSDOT’s overall construction program is delivered with 99.5% of the original budget, individual projects face cost increases. The candid and detailed reporting approach built credibility with the public and legislature. This confidence was

further demonstrated by the Governor's and 2007 legislature's decision to fund cost increases for the 2003 and 2005 funding package projects.

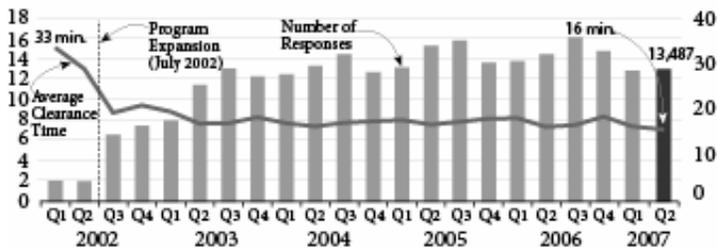
Improving System Performance: Incident Response

WSDOT published extensive system-level performance results. The following is an operational strategy example. In 2002, the average incident clearance time was 33 minutes. After WSDOT provided data, the Legislature funded an expansion of the Incident Response program. As a result, WSDOT was able to reduce clearance times to an average of 18 minutes. Further analysis of the data revealed that the duration of fatality and injury collisions that required more than 90 minutes to clear remained unchanged (21 to 29 percent of all incidents). In response, in 2006 WSDOT and the Washington State Patrol set a goal to reduce the average duration of these long incidents by 5 percent. As of July 2007, the current average is 163 minutes – a 6.3 percent improvement.

Average Clearance Time for All Incidents *GNB, June 2007*

Number of Responses and Overall Average Clearance Time

January 2002 - June 2007
Number in Thousands



Source: WSDOT Incident Response Tracking System.

Note: Program-wide data is available since January 2002. Prior to Q3 of 2003, number of responses by IRT are shown. From Q3-2003, responses by Registered Tow Truck Operators and WSP Cadets have been reported in the total. Average Clearance Time do not include "Unable-to-Locate" responses into calculation.

MISSOURI

Evolution of MoDOT's Performance Measurement System

The Missouri Department of Transportation's (MoDOT) first efforts with using organizational performance measures began in July 2001. These initial measures were intended to communicate with employees, partners, and customers; assist with business planning and management; and provide support for strategic decisions. In 2003, the

performance measurement system was refined to semiannual dashboard and quarterly scorecard measures.

Beginning in January 2005, MoDOT's performance measurement system evolved into the *Tracker*, which currently is comprised of 108 measures. All measures support 18 customer-defined tangible results – results that the Department has identified as its essential services. The tangible results are assigned to senior managers who monitor and devise strategies to improve their results related to the measures. This approach allows departmental goals to be linked to division and work unit actions.

In conjunction with the quarterly *Tracker* publication, Tracker meetings are held with all senior managers and supporting staff to review the measures, strategies, and departmental progress towards improving performance. The *Tracker* and its implementation are by all measures successful, and in the spirit of performance management, the effort is improving with every iteration. Distribution of the *Tracker* is widespread due to its publication on MoDOT's Internet web site. Members of Missouri's legislative body, Missouri's Governor's Office, AASHTO, FHWA, other State DOT staff, and news media are among the groups that regularly access MoDOT's *Tracker*.

The department-wide *Tracker* also is replicated on the district and division unit level to achieve implementation of the Department's performance management throughout. This not only provides a direct link between business units and the overall department goals, but keeps communication lines open within units so all are aware of the direction and actions needed to enhance performance.

The largest impact of using measures is MoDOT's culture change, which has now strongly linked departmental performance with success within the measures. The measures focus the organization's efforts on delivering the Tangible Results to MoDOT's customers. As the *Tracker* matures, MoDOT employees are able see the results of their work and understand how individual and unit performance rolls up to organizational success.

Scope of Performance Management Efforts at MoDOT to Date

MoDOT applies a holistic approach to performance management that links policy development, budget, program and project delivery, operations, and communication to customer service and organizational improvement. Senior leadership developed MoDOT's strategic direction (comprised of a Mission, Values, and Tangible Results) during a strategic advance in November 2004. MoDOT's Tangible Results encompass nearly every area of operation and support service. Planning, programming, and budgeting, program and project delivery, as well as operations are all addressed with Tracker performance measures. The relevance of the Tangible Results has been affirmed by data obtained from multiple customer and stakeholder satisfaction surveys.

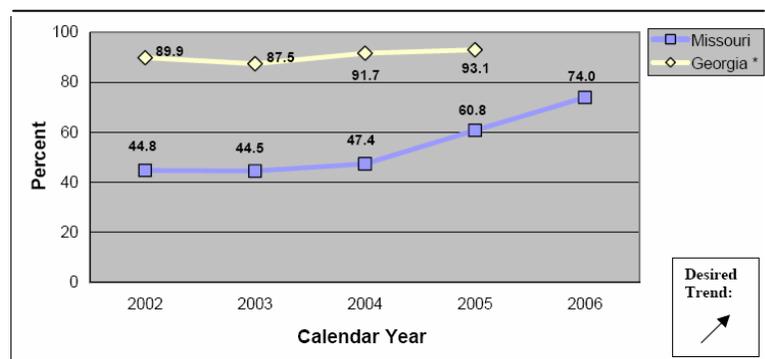
Based on quarterly meetings, and a focus on linking measures to tangible results for our customers, MoDOT's performance management efforts have now become embedded

throughout the Department. The *Tracker* drives short-term action planning and allows for agile decision-making. Longer-term planning is captured in the Missouri Advance Plan (Long-Range Transportation Plan) and the Statewide Transportation Improvement Plan. These efforts are linked directly to measures and strategies within the *Tracker*. This performance management approach truly supports and defines the Department's direction. Similarly, MoDOT's budgetary process began including measures since 2003 from the performance measurement system to provide background information for program funding.

Positive Results from Using Performance Management

MoDOT has realized several positive results from using its performance management system. From a fiscal, operational, and customer satisfaction standpoint, progress has been made. With the quarterly presence of the *Tracker* for performance monitoring of the Smooth Roads Initiative, 74 percent of major highways are in good condition, up from 46 percent. With the *Tracker* efforts

Percent of Major Highways in Good Condition



in monitoring worker performance, Missouri's lost workdays per year in 2007 is 75 percent lower than last year's total, declining from 248 in 2006 to 61 lost workdays in 2007. This results in a healthier work staff and lower medical costs due to work-related injuries. MoDOT overall customer satisfaction has risen from 68 percent in 2003 to 70 percent in 2006 and reaching 79 percent in 2007.

MoDOT's *Tracker* also has drawn the attention of Missouri State government. The Missouri's State Government Review Commission recommended MoDOT's *Tracker* be adopted by all state agencies as a model performance measurement system. The Department feels strongly that the coordinated *Tracker* effort has helped move MoDOT forward in improving performance, accountability, and service to our customers.

MONTANA

Background

Montana is a vast, sparsely populated state with 10,850 centerline miles of State-maintained highways and over 5,000 bridges. For a sense of scale, Montana is larger than the combined land area of the 10 northeastern states and has less than 2 percent of the population of those States, with about 945,000 residents. Of Montana's 56 counties,

23 remain under the 1890 census definition of “frontier” with less than two persons per square mile. The highways under state maintenance account for 16 percent of the state’s public road mileage, but serve about 77 percent of the vehicle miles traveled in the state. The state fuel tax is \$.2775 per gallon and generates about \$7 million annually for each cent of tax. This level of revenue generating capacity is about one-tenth that of the State of Ohio, which has about the same state fuel tax rate.

These descriptive statistics have framed the Montana Department of Transportation’s (MDT) approach to asset management and performance-based programming. The impetus is simple: Montana’s highway program resources are scarce and a performance-based framework is essential to maintain a huge highway system in a severe climate that is essential for the economic health and well being of the state.

History of Montana’s Performance Programming Process (P3)

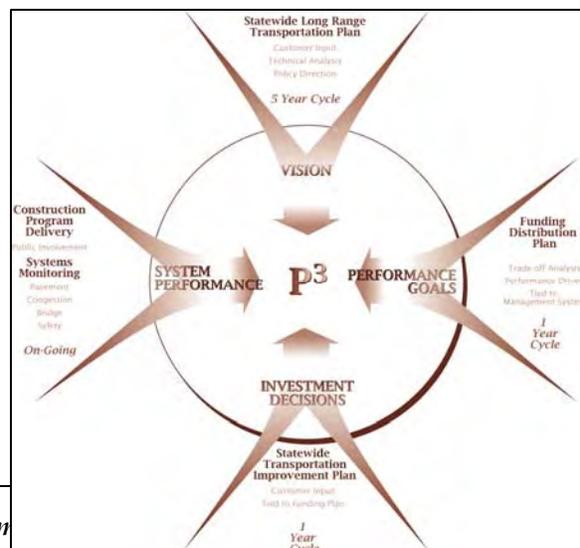
Since the late 1990s, MDT has been improving on an inclusive, performance-driven asset management system referred to as the Performance Programming Process or P3. Asset management is a process that uses management systems to manage infrastructure to meet established performance goals. Asset management is data-driven and based on agreed on policies regarding performance. The data comes from management systems for pavement, bridges, congestion, and safety that continuously track system condition and recommend treatment options to maximize the life of the asset.

P3 in Montana begins with a policy basis in the statewide transportation plan, receives support through continuous data collection on the condition and performance of the system, and ultimately allocates resources to geographic districts, systems, and types of work based on optimizing performance for the target performance goals. It can best be understood as several annual and multiple-year activity cycles that interact to plan, program, and deliver Montana’s highway improvements.

The following are specific examples of P3 cycles at the vision, performance goals, investment decision, and system performance level.

Vision

- MDT’s statewide transportation plan (TRANPLAN 21) links policy and programming decisions to system needs. TRANPLAN performance goals include improving pavement conditions on arterial highways, especially the Interstate, reducing the number of structurally deficient bridges, selectively building capacity, and reducing fatalities.



Performance Goals

- In P3 the key question asked is what can be achieved in terms of system performance given currently available and anticipated funding. This question is answered by performing a series of tradeoffs between improvement strategies for each of the arterial systems and geographic districts.

Investment Decisions

- Annually, a P3 funding distribution plan is approved by Montana’s Transportation Commission. The funding plan moves system performance toward adopted goals. Investment decisions are reinforced by only adding new projects into the program that contribute to the overall performance goals of the system. The management system information used to develop the funding plan also is used to ensure nominated projects contribute to achieving goals.

P3 also has been useful in educating legislators why over-investing in capacity expansion on select corridors will harm overall system performance within a constrained budget.

		MT P³ Performance Measures		
		<u>I</u>	<u>N</u>	<u>P</u>
Pavement	- Average Ride	Desirable or Superior – All Arterials		
	- % Miles below target	<3%	<5%	<5%
Congestion	- LOS	B	C	C
Bridge	- SD/FO Bridges	Reduce	Reduce	Reduce
		#	#	#
Safety	- fatalities & Serious	1.0 / Million VMT by 2015 and		
	Injuries	Reduce Incapacitating injuries to 950		

System Performance

- Asset management also relies on continuous systems monitoring. MDT continually monitors pavements, bridges, congestion, safety, and program delivery. Investment planning through P3 has driven performance improvement. Between 2000 and 2006, the percentage of Montana’s Interstate pavement rated desirable or superior increased from 54 percent to 90 percent. The number of structurally deficient bridges was reduced from 625 in 2000 to 500 in 2006, a 20 percent reduction.

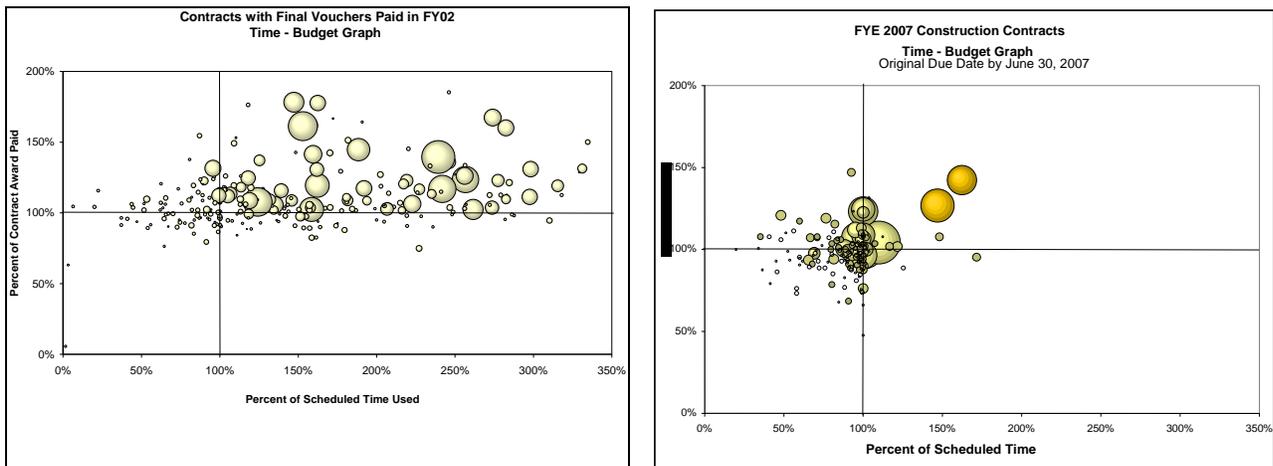
P3 is not a “silver bullet,” but a business process that develops an optimal funding allocation and investment plan based on strategic highway system performance goals, and the continual measurement of progress toward these goals. In Montana, P3 is built on a dialogue with the state’s stakeholders. This process is not static. Rather, emerging issues continue to inform the policy discussions that surround the funding plan, and

system performance continues to be an aligning principle of the Montana Department of Transportation.

VIRGINIA

Prior to 2003, the attitude at the Virginia Department of Transportation (VDOT) that was perceived by many was that “projects will get done when they get done and will cost what they cost.” While there were hundreds of performance measures being followed by individual business units, they were not integrated or coordinated and therefore, did not focus on a few key overall organizational goals. The public lost trust in the VDOT’s ability to deliver and the Department realized that stronger accountability and improved performance was critical to regain that trust.

Starting in 2003, VDOT initiated a new, more focused, performance measurement program. Initially, the program focused on on-time and on-budget delivery of projects. It was felt that these metrics were widely understood by the public and represented an area where improved performance by VDOT was critical both to reestablish credibility and effectively manage available resources. The VDOT Dashboard was created to report specific results to the public and key measures and targets were established. Efforts to improve public communication and organizational effectiveness were started, including a reorganization of internal reporting structures and accountability. Aggressive targets were set and the results were dramatic. From 2001 to estimated results for 2007, construction on-time performance improved from 20 percent to 90 percent and construction on-budget performance improved from 51 percent to 90 percent.



(Contracts highlighted in orange have not yet been completed.)

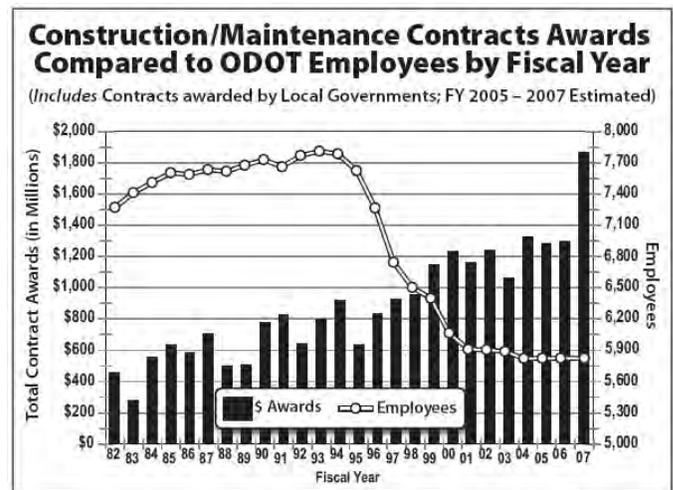
At the beginning of this effort, the focus on-schedule delivery led to some issues with construction quality. However, once those issues were recognized adjustments were made and additional measures related to construction quality, environmental compliance, and roadway safety were added. The focus on delivering contracts on-

budget has led to the realization that a particular type of small- to medium-size bridge maintenance projects seemed to be very difficult to deliver within budget. This pointed out the need to better define contract scopes of work prior to contracting and illustrates the type of learning and improvement that resulted from the focus on performance management.

Additional “second tier” measures have been added to extend the VDOT performance measurement program to all of its functional areas. Starting in 2007, the Dashboard also will be expanded to include measures of congestion, safety, overall management, and customer satisfaction. A key principle in developing a holistic approach to performance management has been transparency. The Dashboard has provided legislators, citizens and the press with access to key performance indicators for VDOT, and the Department has been open to sharing performance results both good and bad on an ongoing basis. The openness to sharing all results and not trying to “spin” all news as good news has helped VDOT reestablish its credibility.

OHIO

The Ohio Department of Transportation has been formally using organizational performance measures since it underwent a major reorganization and reengineering effort in 1995. This effort, tied with a new vision for a transportation agency, reinvented the purpose of the Ohio Department of Transportation, decentralized and streamlined the organization, and focused on processes and results. The graphic “Construction/Maintenance Contracts Awards Compared to ODOT Employees by Fiscal Year” shows dramatic results from the reengineering efforts as the number of employees has dropped by 25 percent and the value of construction projects have doubled.

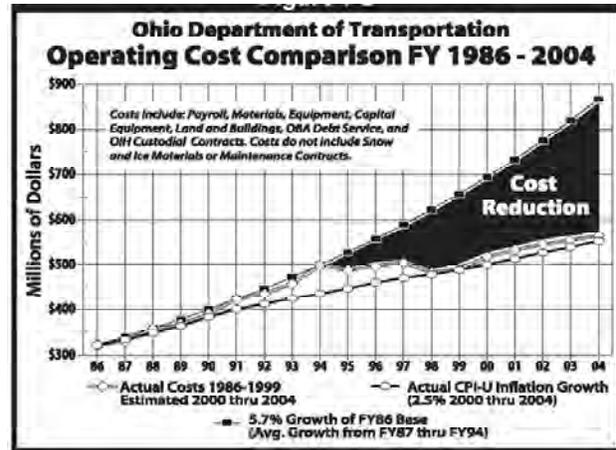


Key measures were identified to monitor pavement and bridge conditions, highway maintenance operations, design and construction functions and other important division results. The Organizational Performance Index reflects 65 of these key measures. It serves as a common reference to support resource allocation decisions, process improvements, as well as individual performance reviews.

Demonstrating organizational performance was a critical element in the state budgeting process. The Department established several years of tightly controlling operating and labor costs, while simultaneously doubling the value of construction projects delivered

to the traveling public. These operational “savings” were then redirected to support additional capital projects, further improving systems conditions and safety. The chart of “Operating Cost Comparison FY 1986-2004” shows one benefit in the cost reduction derived from identifying the 5.7 percent annual growth of the transportation department operating costs and dramatically reversing this growth in 1995, while continuing to hold this cost static for four additional years. Communicating and measuring the commitment to manage operational costs across the organization was critical and involved decisions and prioritization of efforts by everyone. Afterward, operating costs have been deliberately held to half of their prior growth rate.

Improved measurement and forecasting of asset conditions, safety and congestion needs, coupled with a proven track record of internal efficiencies, aided in garnering additional resources through a six-cent motor fuel sales tax increase. The Jobs and Progress program, funded by the additional gas tax revenue, resulted in unprecedented growth in the delivery of new projects to reduce congestion and improve highway safety, while simultaneously maintaining a commitment to sustain the conditions of the existing transportation system.



The conversion of technical data and subjective evaluations into easy to understand performance indicators has been an ongoing challenge for many transportation agencies. To be effective, these indicators need to focus on results, provide timely and actionable feedback, and address the focus of the customers and the agency. Our experience has seen that the establishment of performance measures, followed up by an organizational commitment to affect these measures, can help support substantial change and improved services.

Numerous examples of excellence have resulted from the implementation of performance measurement as attested by several levels of success with the State of Ohio version of the Baldrige Quality Assessment. This includes two districts distinguished at the highest level of quality commitment, on par with the best of private sector.

MICHIGAN

At the Michigan Department of Transportation (MDOT), asset management and performance measurement are integral to our business processes. Asset management is an efficient and cost-effective way of strategically targeting our resources.

Over the past decade, MDOT has developed strategic goals on a system-wide basis, which we are now close to achieving. Having just completed a new SAFETEA-LU-compliant Statewide Long Range Plan, based on intense public involvement, the Department is about to embark on a new and more encompassing round of goal setting and performance measurement.

Policy Goals and Objectives

In 1998, MDOT developed its first business plan, or strategic plan, to direct and unify the focus of the organization.

Just after that, the State Transportation Commission and the Michigan Department of Transportation responded to public demand for better highways by adopting these goals for the highway system under MDOT’s jurisdiction:

- Ninety-five percent of freeway pavement and 85 percent of non-freeway pavement in good condition by 2007; and
- Ninety-five percent of freeway bridges and 85 percent of non-freeway bridges in good condition by 2008.

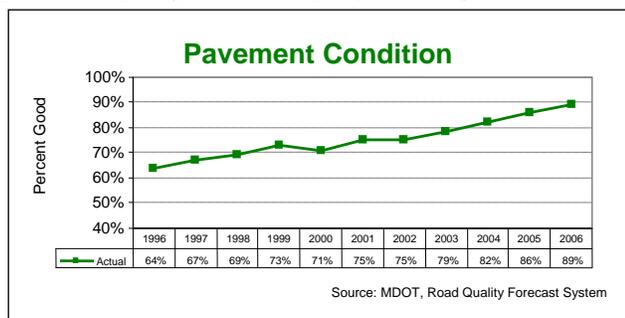
An additional goal was set for the Department in 2003 when it adopted the National Highway Traffic Safety Administration and U.S. DOT safety goal of one fatality per 100 million vehicle miles of travel.

Data Collection and Analysis

The amount of data collected and stored at MDOT is, as at any State DOT, voluminous. One important way to make use of data is to measure progress toward a goal. By using tools such as MDOT’s Road Quality Forecast System and a project prioritization model, the Department has been able to develop annual programs and projects targeted toward achieving the pavement and bridge goals.

In addition, MDOT has been working over the past three years with Local road agencies to consistently measure the condition of all Federal-aid eligible pavements, regardless of whose jurisdiction they are under, as part of a unifying asset management effort.

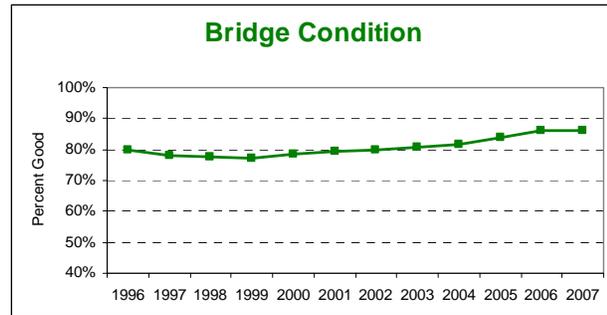
MDOT also has worked closely with the Michigan State Police and the Office of Highway Safety Planning to ensure the timely completion and accuracy of safety data, in order to measure progress toward the safety goal.



Planning and Programming

In 2001, MDOT conducted a series of public meetings and worked with a Customer Advisory Group to develop its State Long-Range Transportation Plan (SLRP) under TEA-21.

Working toward the achievement of the pavement and bridge goals included in this plan drove MDOT over the next several years. Funding was adjusted and projects selected for the State Transportation Improvement Program (STIP) based on the pavement and bridge goals. In particular, bridge funds were increased, and expansion projects postponed or curtailed, so the Department could make greater progress.



With regard to the national safety goal, Michigan has much to be proud of. Since 2004, Michigan has consistently exceeded 90 percent seatbelt use, and has been among the top six states nationwide. In 2004, Michigan had the second largest reduction in the number of crash fatalities, and had another 3 percent decrease in crash fatalities in 2005.

MDOT has also set additional goals for its business processes. The sense of urgency in delivering the program within scope, within budget, and on schedule has allowed MDOT to consistently *let over 90 percent of our programs in the first six months of the year and let nearly 95 percent of programmed projects on schedule.* In addition, *the program has been delivered with cost overruns of 3 percent or lower for the past five years.* In 2005, the percent difference for extras and overruns was actually a negative number, i.e., final contract cost were actually just under original cost estimates.

What's Next?

In 2006, MDOT completed a new Strategic Plan. Although the organization's mission remains the same, one of the plan's new goals reflects the need to provide integrated transportation systems, something reinforced by the public involvement effort for the Department's latest long range transportation plan. As a result, MDOT is now considering adopting new system performance measures. However, one of the other discoveries of the recent public involvement effort helped to confirm that there is a financial gap between the public's expectations and MDOT's ability to deliver. The state's seismically shifting economy, increasing gas prices, and decreasing travel and revenue have stalled the agencies ability to make further significant change.

CALIFORNIA

Overview

The California Department of Transportation (Caltrans) is implementing a performance management program that includes three components:

- *Strategic Plan* - Caltrans recently updated its five-year strategic plan (2007 through 2012). This plan includes the mission/vision, values, goals, objectives, and the strategies to achieve each objective. Caltrans took an unprecedented step of providing every employee the opportunity to participate in developing the strategic plan to ensure buy-in, commitment, and ownership of the plan at all staff levels. Meetings were conducted throughout the state to allow staff participation. There are five goals (safety, mobility, delivery, stewardship, and service) and 26 objectives in the strategic plan. Each objective has a specific target to be completed by 2012. To ensure that the ultimate target for each objective is reached, annual targets have been established for each of the five fiscal years covered in the strategic plan.
- *Operational Plan* - The operational plan includes all Caltrans' activities that repeat from year to year. It is a fully resourced plan and reflects each fiscal year's planned use of budgeted resources. All activities line up to the key objectives and goals for the Department. Each year, the operational plan reflects the annual targets from the strategic plan.
- *Performance Measures* - Either on a quarterly or annual basis (depending on the measure), Caltrans will monitor progress towards achieving each of the objectives. It will assess whether the annual target was met and how resources were used to meet the target. This will enable adjustments to be made - whether the appropriate resources were allocated towards meeting an objective (too much or too little), annual targets need to be adjusted to meet ultimate goal, etc. It can help identify where resources can be used to address higher priority needs - within programs and across programs.

Together, these will serve as the tool to inform management, drive budget decisions, and achieve organizational results. Caltrans is just in the early stages of this process implementation. However, Caltrans has extensively used performance measures to drive individual program performance in areas such as project delivery, maintenance and operations, and programming/budgeting.

Examples of Specific Functional Use

Policy Development and Long-Range Planning

California Transportation Plan (CTP) is the product of extensive public outreach and consultation with transportation partners and stakeholders. The CTP presents a vision

for California's future transportation system, and defines goals, policies, and strategies to guide decisions. The CTP vision is one of a fully integrated, multimodal, sustainable transportation system. The CTP provides a common policy and strategic framework for decision-makers at all levels of government and the private sector to guide transportation decisions and investments that will create a world-class transportation. This framework is built upon a set of System Performance Measures related to mobility, accessibility, preservation, economic vitality, safety and security, equity, and environmental quality.

Regional Transportation Plan (RTP) Guidelines have set the policy framework for the state's MPOs to develop Federally required RTPs. The current version of the Guidelines contains substantial language to assist the MPOs and Regional Transportation Planning Agencies in their development of RTPs that fit within the California Transportation Plan framework. The guidelines are presently under revision with further strengthening of the role of System Performance Measures to serve as the foundation to set regional goals, assess performance, and evaluate and develop solutions. System Performance Measures are becoming a common thread to connect the RTPs required policy, action, and financial elements.

Programming and Budgeting

California's State Transportation Improvement Program (STIP) Guidelines set the project decision and scheduling framework to select a program of deliverable and funded state and regional projects that enhance transportation system performance. Both the State and regional agencies quantify performance measures and indicators to link the project back to the Regional Transportation Plan. This action strengthens the connectivity between long-range planning goals and programming.

Program and Project Delivery

Caltrans has historically been reporting key project delivery milestones internally and externally (i.e., California Transportation Commission and others). Caltrans' Director, Will Kempton entered into Contracts for Delivery with each District Director to ensure project delivery commitments are met. As a result, in each of the last two years, nearly 100 percent of contract project delivery commitments were met. The Director also has entered into Contracts for Performance and Innovation with each of his Deputy Directors. These contracts include key performance objectives and measures that align with overall strategic goals.

Operations

Caltrans is piloting a State Highway Operations and Protection Program (SHOPP) Investment Analysis. Past decisions regarding allocation of available funding among the various SHOPP categories were largely guided by historical trends. The prototype tool is based on Asset Manager NT and includes a database of information on systems maintenance and operating needs, the cost of addressing the needs, and the anticipated outcome of these investments in terms of performance improvements. The tool

compliments existing department models and supports SHOPP decision-making. The needs-based approach fits with the Caltrans' efforts in performance measurement and system management.

NEW YORK

The New York State Department of Transportation is in the process of expanding the many successful performance management efforts that have occurred within individual units into a more comprehensive agency-wide performance management program.

A number of significant and ambitious performance measurement systems have been developed to this point. The Department is tracking its performance measures through an internal, web-based system of "Dashboards" that were developed in-house. This web-based system allows users to "drill down" into different levels of performance, as well as linking to explanatory information, various trends, pie/bar charts, maps, and e-mail addresses of experts for each individual performance indicators. Three main Dashboards are available on the Department's internal web site - the Systems Dashboard, the Executive Dashboard, and the Operator Dashboard. All three dashboards are still being refined.

The Systems Dashboard is intended to measure the impact of the entire state transportation system, and focuses on multimodal, customer focused, outcome-based indicators at the agency-wide or statewide level. This ambitious application presents significant performance management challenges, as the indicators include measures of performance that the Department itself often has little or no control or influence over. In addition, many of the measures on the System Dashboard track the performance of other transportation agencies despite the lack of either a "carrot" or "stick" for influencing their performance. The difficulties inherent to such a system account for the formative nature of the Department's corporate performance management efforts, which require sustained executive attention, increased resources, and cultural change.

In addition to this set of system-wide measures, another set of measures that is still being developed and refined is reflected in the Executive Dashboard. This set of measures is focused on more attainable and pragmatic goals based on indicators the Department has traditionally tracked and has more direct control over. These indicators include pavement and bridge conditions, project delivery, programming and budgeting, operations, and workforce diversity.

There also is an Operator Dashboard developed for the Department's Operating Division. This Dashboard includes measures related to managing the everyday performance of the Department's valuable assets. It also compares the projected output accomplishments of regional performance against essential outcomes such as pavement and bridge conditions.

MARYLAND

Maryland's Department of Transportation, State Highway Administration (SHA) has been engaged in performance management for 10 years. The initial efforts began with the passage of Maryland's Managing for Results (MFR) statute. MFR in Maryland requires that state agencies report performance data with their annual budget request. The focus is on organizational outcomes that are important to customers and external stakeholders. A core set of performance measures (such as highway fatality and injury rates, pavement condition, wetland replacement quantities, and overall customer satisfaction) have been compiled and reported annually since that time. This year, with the election of Governor Martin O'Malley, Maryland's performance measures programs were elevated to StateStat, based on the CitiStat approaches used in Baltimore and New York. StateStat focuses on operational performance measures that point to specific products and services that need attention to achieve quick improvements in them.

MSHA was well-positioned to meet the Governor's expectations due to their internal efforts over the past four years. SHA implemented a Performance Excellence initiative that is comprised of five areas, one of which is Business Planning and Performance Measurement (BP/PM). The BP/PM program at MSHA includes four key components. They are:

1. SHA-wide business plan with approximately 400 performance measures. This plan articulates MSHA's six goals, one for each key performance areas of Highway Safety, Mobility, System Preservation and Maintenance, Environmental Stewardship, Organizational Effectiveness and Customer Communication, Service, Satisfaction;
2. "Local" business plans in each of the offices/districts with supporting measures and strategies;
3. Common performance measures across District Offices; and
4. Performance-based employee appraisal that is being piloted by SHA's middle and senior managers.

MSHA uses their performance measures program in the following ways:

- **Budgeting and Programming** - Performance measures are used to demonstrate the need for state system preservation capital and operating funds to the Maryland Legislature, especially for pavement, bridge, and roadway maintenance. MSHA requests funding enhancements in specific areas where performance results indicate that additional funding is needed to sustain or improve performance. Furthermore, when substantial increases in funding are secured, such as last year's increase in bridge maintenance funding, the performance data demonstrates how the money was used.

- **Program Management and Project Delivery** - Financial performance data for capital projects have been linked to specific program outcome objectives. Once overall funding levels for these programs are established, program activities are reviewed based on quarterly performance results and adjusted as necessary to optimize performance. MSHA has many examples of where programs are managed using performance measures; the key ones are highway safety, pavement, bridge, maintenance activities, environmental compliance, and ITS.
- **Operations** - MSHA's District Offices have established a common set of outcome measures that are set to appropriate targets for each district. This sets the stage for operational decisions across the districts. The most successful application has been in managing maintenance activities. MSHA has a robust data repository to maintenance activities that track outputs and efficiency through each the district maintenance shop; which can then be used to adjust work activity priorities.
- **Monitoring Results, Feedback, and Communication** - MSHA's leadership monitors agencywide performance results on a quarterly basis. Feedback is provided to KPA leaders about performance that is outstanding, on track, and needs improvement. Manager's performance appraisals are based on performance plans that link to office/district business plans as well as individual performance targets. Finally, agencywide performance reported in MSHA's Annual Report is based on the business plan performance measures and strategy accomplishments.

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