

AMERICAN ASSOCIATION  
OF STATE HIGHWAY AND  
TRANSPORTATION OFFICIALS

**AASHTO**

TESTIMONY OF  
**The Honorable David B. Nichols, P.E.**  
Director, Missouri Department of Transportation  
Acting Chair, AASHTO Standing Committee on Performance  
Management

REGARDING  
**Surface Transportation Reauthorization:  
Performance, not Prescription**

BEFORE THE  
**Subcommittee on Surface Transportation and  
Merchant Marine, Infrastructure, Safety and  
Security of the Committee on Commerce, Science,  
and Transportation of the United States Senate**

ON  
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## INTRODUCTION

Chairwoman Fischer, Ranking Member Booker, and Members of the Subcommittee, thank you for the opportunity to provide input on the implementation of transportation performance management programs within the State Departments of Transportation. My name is David Nichols, and I serve as the Director of the Missouri Department of Transportation (MoDOT) and the Acting Chair of the American Association of State Highway and Transportation Officials' (AASHTO) Standing Committee on Performance Management. Today it is my honor to testify on behalf of the State of Missouri and AASHTO, which represents the State departments of transportation (State DOTs) of all 50 States, Washington, D.C., and Puerto Rico.

I have been honored to serve as Director of the Missouri Department of Transportation for the past two years. I have spent the past 31 years in public service at MoDOT, starting in 1984, and have served in a variety of leadership roles, including District Engineer, Director of Program Delivery, and Chief Engineer, prior to becoming Director.

Three of my passions have been: safety on our roadways, for motorists, passengers, pedestrians and highway workers; innovation in everything we do in order to give our customers the best value for every dollar they invest in transportation; and diversity within our workforce, both for the MoDOT team and our contracting partners.

Missouri has been a leader among the State DOTs in striving for better outcomes through implementation of transportation performance management principles. And in my role as Acting Chair of AASHTO's Standing Committee on Performance Management, I lead the Association's work in identifying and implementing best practices and providing input and guidance on a number of federal regulations that are currently being developed by the United States Department of Transportation (USDOT) in response to the important recent changes made in the Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21) requirements.

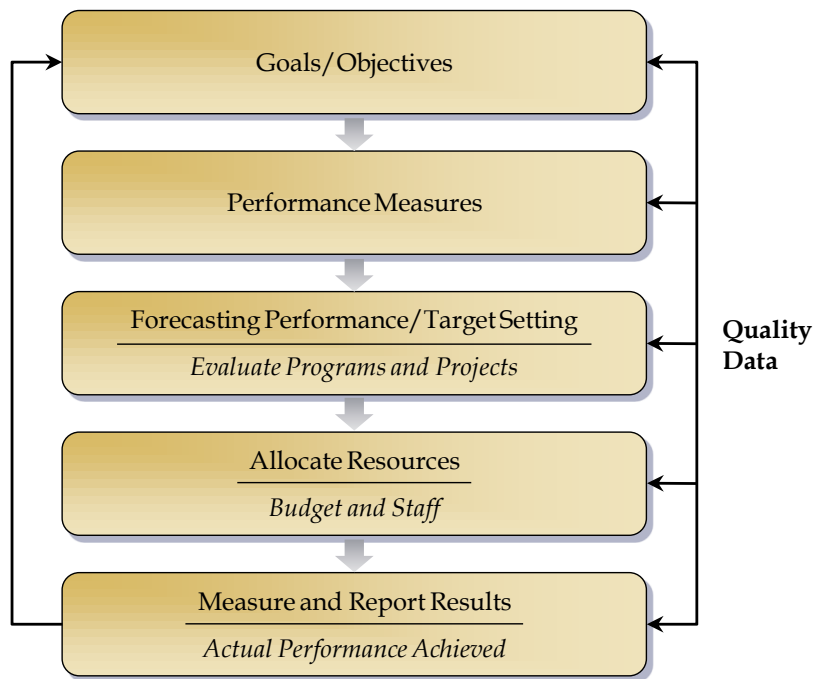
My main message this morning is to share with you the experience of the State DOTs, including my home state of Missouri DOT, in the implementation of transportation performance management programs. Performance management, if implemented in a logical and thoughtful way, can be a very powerful tool to MoDOT and our peer agencies in managing the performance of the entire transportation system. However, I must also note that performance management is not a panacea and cannot be expected to improve the condition of our transportation assets or performance of the transportation system in the absence of a robust transportation funding platform. It is critical that everyone works together to establish a long-term, sustainable transportation funding framework to truly see the benefits of transportation performance management. Without this funding base, all we can do as State DOT directors is to merely manage the gradual degradation of our national and regional transportation system that underpins our economy and quality of life.

My testimony today will emphasize three main points:

1. State DOTs are already implementing performance management principles;
2. Experience of Missouri DOT in implementing performance management; and
3. Lessons to offer in implementing national-level performance management requirements.

## STATE DOTs ARE ALREADY IMPLEMENTING PERFORMANCE MANAGEMENT PRINCIPLES

It is important to have a basic understanding of the concepts involved in performance management. Performance management is an iterative process that requires good data and feedback loops that inform the overall decision-making process. Most importantly, it takes time for performance management to show results. At the broadest level, performance management is about linking agency goals and objectives with resources and results as shown in Figure 1.



**Figure 1. Performance Management Framework**  
*Linking Goals/Objectives to Resource and Results*

In the surface transportation context, state DOTs first establish goals and objectives. Goal areas may be developed within the agency or be directed to the agency from the governor, for example. Many State DOTs are now focused on linking the transportation system to improve economic development and growth. Other goal areas may focus on more traditional emphasis areas such as safety, operations, system performance and agency performance in areas such as project delivery.

Second, agencies establish performance measures that are used for both day-to-day and strategic management. Broader performance management measures might include travel time and delay, fatalities and serious injuries as well as specific measures of agency performance such as on-time and on-budget project delivery.

Third, an agency will make decisions on how to allocate resources within and across different types of investments based on an analysis of how different allocations will impact achievement of policy objectives and performance goals. For some goals, this may include forecasting the likely performance impacts of different strategies and setting performance targets. For example, a

tradeoff analysis of reducing congestion may involve finding the right mix of capital expansion and operations strategies given the constrained funding resources available.

Fourth, state DOTs must allocate the limited funding resources they have to the projects that will improve the overall performance of the transportation system. The allocation of resources is not about identifying projects that are “wanted” versus “needed” but rather which projects must be funded now versus those projects that can be delayed until additional funding is made available. State DOTs have many different tools for assisting decision makers in conducting resource allocation from sophisticated quantitative econometric models to more qualitative assessments conducted by staff.

Finally, once the projects have been funded and built, the actual performance impact of programs and projects are tracked over time and provide the basis for evaluating the most effective strategies to achieve desired goals. Recognizing realistic timeframes for observing performance results and understanding that these timeframes will vary by performance area is important. For example, for many key performance measures related to economic development, pavement condition, and safety, changes in performance will only be observable over a number of years. On the other hand, some aspects of system operations or agency performance changes can be tracked on a monthly or even daily basis.

One of MAP-21’s key legacies is that it established a set of new national policy goals that aims to both focus and prioritize the Federal-aid Highway Program investments. While this is the first time that State DOTs, Metropolitan Planning Organizations (MPOs) and transit agencies are required to track, measure and report on transportation performance using a consistent, national framework, it is certainly not the first time that State DOTs have implemented performance management concepts. All states have implemented some aspect of transportation asset management, a subset of performance management. And, many State DOTs have implemented comprehensive and robust performance management systems to balance investment decisions against the varying resources and approaches provided by local, state and federal government.

States such as Colorado, North Carolina, Utah, Minnesota, and Maryland have created programs to manage their physical assets and focus on the principles of transportation asset management as opposed to a “worst-first” approach. Other states such as Missouri, Washington State, and Virginia have well-known performance management programs that go well beyond the management of physical assets. Missouri’s *Tracker* is a tool to assess how well MoDOT delivers services and products to their customers (<http://www.modot.org/about/Tracker.htm>). Washington State’s *Gray Notebook* is the Washington State DOT’s quarterly accountability report that has been in existence since 2001 (<http://www.wsdot.wa.gov/Accountability/>). Virginia DOT helped to pioneer the transportation dashboard concept (<http://dashboard.virginiadot.org/>).

What MAP-21 requires of the State DOTs and MPOs is to report on twelve national-level performance measures that U.S. DOT can use to tell a comprehensive story about the status of the nation’s transportation infrastructure. Often, these national-level measures are referred to as a thin layer of measures that sit on top of a much more robust set of performance measures that State DOTs use on a regular basis to plan, program, and operate their transportation networks.

It's true that there have been, and will continue to be, many challenges to effectively implementing MAP-21. But I can also assure you that State DOTs are never one to shy away from a challenge. Over the past decade the States DOTs – through the National Cooperative Highway Research Program of the Transportation Research Board – have proposed, supported and actively engaged in applied research to advance the use of performance measurement to address complex management challenges and to enhance organizational and program effectiveness. This research has produced a series of comparative performance measures reports and compiled substantial know-how on successful data- and system-management techniques for performance measurement. More recently, the State DOTs, along with their MPO and transit partners, have been engaged with USDOT's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) in discussing, promoting and testing performance measures and performance-based planning and programming.

## **EXPERIENCE OF MISSOURI DOT IN IMPLEMENTING PERFORMANCE MANAGEMENT**

State DOTs have significant experience in implementing performance management. I would argue that Missouri is one of the leaders in this area. While Missouri will work with the USDOT in implementing MAP-21 performance management requirements, MAP-21 is focused primarily on national goals, national level measures, and the federal investment. As the director of the Missouri DOT, I must also contend with a number of state goal areas and funding sources. I'd like to share with you some details about Missouri's efforts and how we document our performance.

### **The Need for *Tracker*, MoDOT's Performance Management Tool**

In the late 1990s and early 2000s, the Missouri Department of Transportation began to consider performance management and data-driven decision making, but struggled with how to start. In 2004, the department finally set itself on a path to start collecting data and publishing measurements on which we could continuously build.

After establishing the agency's fundamental values and collecting the necessary data to develop performance measures, MoDOT published the first *Tracker* in January 2005. This publically available report documents how MoDOT meets its goals and fulfills its mission and tangible results on a quarterly basis.

### **Focused on Customer Expectations**

MoDOT originally built the *Tracker* around 18 tangible results which have since been refined to the current seven. These are the outcomes the public expects, and they guide us in everyday decision making. To increase accountability, each of the seven tangible results is assigned to a specific senior leader who is charged with meeting the department's goals and obtaining the various associated metrics.

The seven tangible results are:

1. Keep customers and ourselves safe
2. Keep roads and bridges in good condition
3. Provide outstanding customer service
4. Deliver transportation solutions of great value
5. Operate a reliable and convenient transportation system

6. Use resources wisely
7. Advance economic development

### **Accountability for Results**

MoDOT uses a range of performance measures to focus and encourage progress in achieving the tangible results. Every performance measure in the *Tracker* corresponds to a specific tangible result. Just as each tangible result is assigned to one senior leader, every underlying performance measure is assigned to a single staff member. The “measurement driver” is the lead staff person responsible for collecting data and meeting the specific measurement’s objective.

This model ensures accountability both internally and with the public. Each staff member must report on his/her performance measure to me, senior leadership and various statewide staff at quarterly *Tracker* meetings. The quarterly *Tracker* allows MoDOT to continually monitor progress and provides transparent information to the public.

### **Multiple Measures Drive Performance Areas**

There are multiple performance metrics associated with each tangible result, in order to address it comprehensively. For example, “Keep Customers and Ourselves Safe” includes metrics on fatality and injury reports as well as lost work days and general liability claims and costs. All metrics are collected quarterly, semi-annually, or annually through various data systems and other reporting means. The *Tracker* details how measurements are calculated and analyzed. The *Tracker* report is highly graphical, using charts to present each metric in a simple format. The charts frequently include benchmarks to show how MoDOT compares to other states or private corporations measuring similar elements.

### **Driving Results for Any Challenge**

The *Tracker* tool’s flexible nature has allowed MoDOT to establish a performance-based culture and evolve with changes in leadership and policy. Through flexibility and accountability, the *Tracker* ensures efficient and effective decision making. *Tracker* has helped managers and employees at every level of the department make better daily decisions by providing the data and links to how those decisions will impact the agency’s overall performance.

Safety is a good example. Since implementing *Tracker* 10 years ago, the number of fatalities on Missouri’s roadways has dropped from 1,257 in 2005 to 766 in 2014. You may be aware that this week is national work zone awareness week, and in Missouri work zone safety is at the center of our safety culture. Staying safe in work zones is a partnership between MoDOT, our contractors, law enforcement, and the driving public. Our *Tracker* follows the number of fatalities, the number of injuries, and the number of crashes in work zones every quarter. By placing the focus of the performance measure on reducing those numbers, we can pursue actions that make work zones safer for everyone. Over ten years, we’ve seen the number of work zone crashes drop from 4,492 in 2003 to 1,509 in 2013.

Our tangible result on keeping roads and bridges in good condition acknowledges one of our core functions and Missourians’ desire for smooth pavements and bridges that can safely handle growing traffic demands. With the seventh largest highway system in the country (almost 34,000 miles and over 10,400 bridges), Missouri ranks 46<sup>th</sup> in revenue spent per mile. We use performance

data to focus our very limited resources to keep our most heavily traveled roads as smooth as possible.

Since 2005 the percentage of major highways in good condition has increased from 60 percent to 89 percent. But by 2017, we face a funding crisis that will make these stats nearly impossible to maintain. When our construction awards drop below the amount needed just to maintain the system in the condition it's in today, we will struggle to meet these measures. But our performance management system will continue to help us make the best decisions on using every dollar we spend.

We are focused on providing outstanding customer service. Every single MoDOT employee is responsible for this tangible result, and we strive to be respectful, responsive and clear in all our communication. With data-driven decisions and public input shaping performance metrics, MoDOT's customer satisfaction has increased from 67 percent in 2005 to 85 percent in 2013. MoDOT's overall customer satisfaction has attained a level that exceeds the private sector – in 2012, Apple ranked at 83 percent, and the Missouri DOT hit 85 percent.

Advancing economic development is yet another of Missouri's critical tangible results. Missouri's transportation system has a direct impact on the state's economy. Local, national and international businesses depend on our roadways, rail, waterways, transit and airports to move their products and get people to their jobs. We believe investments in transportation create jobs and provide opportunities for advancement to all Missouri citizens. An investment in transportation provides a positive economic impact on both the citizens we serve and the communities in which they live.

One such performance measure we track is the economic return from transportation investment. Our customers and state decision makers can easily see how our construction program contributes to the economy through this measure. Based on MoDOT's 2015-2019 Statewide Transportation Improvement Program investment of \$3.5 billion, the program is estimated to create 4,000 new jobs. Transportation investments are expected to contribute \$10.1 billion of economic output during the next 20 years, resulting in a \$3 return on every \$1 invested in transportation.

The figures tell a powerful story of economic success, but are also a sign of missed opportunity. When compared to the previous year's STIP (2014-2018), the number of jobs created estimate decreased 40 percent. Also, compared to a period of sustained transportation investment in our state from 2005-2010, when many major projects were completed, our return on investment was at \$4 on every \$1 invested in transportation.

A year ago, MoDOT completed its long-range transportation plan. Utilizing a robust public engagement plan, we visited with thousands of Missourians where they live, work and play to learn their vision for Missouri's transportation future. Without question, one of the common themes they repeated over and over again was the desire for more transportation choices, and for improved integration of all of our modes of transportation. Because of our central location and because of the many transportation assets that we enjoy, this is important to our economic vitality and our quality of life. Our performance management system tracks the use and connectivity of our modes of transportation, and we also pay keen attention to our competitiveness in the efficient movement of goods.

Because we administer state and federal funds that pass through MoDOT and on to local public agencies, we have worked diligently to help them develop and deliver projects faster and on budget. The performance metrics established to that end have helped us see dramatic results in just a few years' time.

MoDOT believes it is good business to support diversity, not just in MoDOT, but also among its contractors, subcontractors and suppliers. Contractors, subcontractors, and suppliers working on construction projects that receive federal aid or federal financial participation are required to take reasonable steps to ensure disadvantaged business enterprises have an opportunity to compete for and participate in project contracts and subcontracts. Here, too, we have made data-driven decisions, which have helped us improve our DBE participation by 78 percent over the past three years.

### **Looking Ahead**

MoDOT has used its performance management system to create a results focused culture among its employees and improved satisfaction and credibility among its customers. It has provided an organizational framework for a decade of leaders to deliver results to meet any challenge. Managers and employees at every level of our organization use performance data to make better daily decisions. And while the pending funding shortfall will undoubtedly have a negative effect on many areas of performance, our performance management system will continue to help us stretch our limited funds. Performance goals and results may change over time, but I'm confident our performance management system will remain tightly woven in MoDOT's organizational fabric.

## **ISSUES AND CHALLENGES IN IMPLEMENTING NATIONAL-LEVEL PERFORMANCE MANAGEMENT REQUIREMENTS.**

AASHTO and the State DOTs are supportive of the MAP-21 performance provisions and believe that the continued implementation and maturation of performance management principles within the transportation industry will be a positive step towards a safer and more efficient transportation system. However, this is only the beginning of a long journey that the federal, state, and local governments will complete together as partners. There are some recognized challenges ahead and as such, AASHTO and the State DOTs will continue to engage with FHWA, FTA, the National Highway Traffic Safety Administration (NHTSA), and other stakeholders to address these challenges together. I would like to elaborate on three of the challenges State DOTs will face: funding, minimum condition levels, and target setting.

The first challenge is assessing necessary funding to implement performance management requirements. The cost to implement the performance management requirements: from data collection and management to analysis to reporting is not trivial. AASHTO conducted a survey of its members to gather additional input on the estimated cost of meeting new safety data requirements and came to the following conclusion for an average state:



### **Year 1 Expenses**

- Information Technology Cost for entering, storing and reporting the data: \$4 million.
- Data Collection which includes additional counting equipment, vehicles, and personnel: \$6 million.
- Additional Staff to administer the data collection program: \$1 million.

### **Year 2 through 16 Expenses**

- Annual Operations and Management: \$2 million.

### **Total Costs**

- Total Year 1 Expenses for All State DOTs: \$561 million (\$11 million/state \* 51 states)
- Total Year 2 through 16 Expenses: \$1.53 billion (\$2 million/state \* 51 states \* 15 years)
- Total Undiscounted Cost: \$2.091 billion

These costs are only estimates to implement the new requirements associated with the safety national-level measures. Additional costs, that are similar in order of magnitude, will be associated with the implementation of the bridge/pavement national-level measures and the system performance measures. It is important that we balance the need to collect the necessary and important data with the benefits of performance management. The more State DOTs spend on data collection, management and analysis means less money we can use to invest in safety programs, pavement resurfacing projects, and congestion mitigation projects.

The second challenge is the need to meet certain minimum condition levels established by U.S. DOT. An important aspect of implementing performance management is to provide the correct treatment at the right time in the life cycle of the infrastructure asset. This may mean not treating the worst item or segment of roadway first. State DOTs are concerned that the “minimum condition” requirements for National Highway System bridges and Interstate System pavement may force State DOTs into adopting a worst-first approach, since the State DOTs will be required to include in their overall performance management systems not only the federally-required assets (bridges carrying the NHS, Interstate Pavement and non-Interstate NHS pavements) but many locally and state-owned assets as well.

The third challenge is the area of target setting. It is crucial for the State DOTs to work closely with our planning and transit partners in developing and establishing targets and then working together to meet those targets. However, target setting is not a well-established science, especially when considered under political context. Every state and municipality faces different constraints and opportunities affecting their transportation system. Funding levels and sources vary, as do environmental conditions, population growth trends, and legislative and gubernatorial mandates and priorities. State DOTs and MPOs will have to face the realities of their individual contexts and will need to establish appropriate targets that take into account these unique situations. For many, this will be a challenge; but the traveling public will be rewarded with improved mobility outcomes.

## CONCLUSION

Performance management, the development of performance measures, and establishing performance targets is not new to the State DOTs. For the last decade, many State DOTs have developed and implemented comprehensive and robust performance management systems to balance investment decisions against resource limitations. An important aspect of this has been examining performance measures for a wide variety of areas from safety to asset condition to performance of the transportation system. State DOTs are concerned with all of these performance areas and must balance the funding of programs and projects across areas while at the same time meet stakeholder expectations during a time of financial uncertainty.

I want to thank you again for the opportunity to testify today, and I am happy to respond to any questions that you may have.