NCHRP

REPORT 660

NATIONAL
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RESEARCH
PROGRAM

Transportation Performance Management: Insight from Practitioners

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

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FOREWORD

By Lori L. Sundstrom
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This guidebook provides insights from selected transportation agencies who are successfully integrating transportation performance management programs into a range of key decision-making processes in order to improve their effectiveness and transparency. This guidebook will assist transportation agency staff challenged with turning performance data into meaningful information that will influence agency decisions and actions. It should be of immediate use to those who have mastered the basics of performance measurement but who will benefit from a deeper understanding of what similar organizations have done in order to successfully integrate these systems into key decision-making processes.

In recent years, a growing number of state departments of transportation (DOTs) have initiated comprehensive transportation performance management programs, often to fulfill statutory mandates designed to inform the public about departmental actions. Transportation performance management systems are increasingly being developed or enhanced to support a broad range of activities such as strategic planning and decision-making, comprehensive asset management, transportation system performance, project delivery, budget and cost control, program efficiency, and demonstration of effective departmental stewardship of public funding. Implementation and integration of transportation performance management programs into the fabric of an agency's decision-making is essential, not only to make the transition to more business-like operations but also to ensure that agency responses to emerging issues are being effectively and efficiently carried out. To date, research into transportation performance management programs has focused primarily on specific areas of measurement and the tools and institutional frameworks necessary for evaluating the performance of projects and programs.

Under NCHRP Project 08-62, Cambridge Systematics was asked to develop a guidebook that reflects current practice in designing, implementing, and sustaining transportation performance management programs in state DOTs as well as other organizations whose experience is relevant. The research team was also tasked with identifying effective performance management frameworks and related tools that focus on how performance management programs are being integrated into decision-making. To meet the project objectives, the research team conducted a literature review and considered performance measurement programs at the federal, state, and local levels, and in the nonprofit sector. Outreach to 30 organizations considered to have advanced practices was conducted, and six in-depth case studies were prepared. The contractor's Project Final Report that contains the results of the literature review and the results of the outreach and case study efforts are available on the TRB project website.

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SUMMARY

Transportation Performance Management: Insight from Practitioners

Performance management is a tool for diagnosing and solving (or avoiding) problems. In recent years, many DOTs have begun to recognize the need to support decisions—both large decisions about major projects or initiatives and smaller everyday decisions—with improved data and analysis. The combination of flat or declining revenues with equal or greater demand from customers for quality service has caused agencies to turn to new methods to help them get more with less. Performance management provides a framework that can help transportation agencies set realistic goals, focus on the most important challenges, and improve efficiency.

All DOTs collect substantial amounts of data, and many DOTs also already calculate performance measures. In the last several years, however, there has been a shift from performance measurement to performance management as well as from reporting whatever data are on hand to carefully and strategically selecting measures, setting targets, reporting measures, and using this information to shape decisions.

This Guidebook considers the moment of decision-making and examines the practices several transportation agencies use to bring performance considerations into the process. It applies to a broad range of decisions, including the following:

- Strategy decisions, such as: What is the focus of the agency? What are the key initiatives that should be pursued over the next several years? What are the most pressing challenges?
- Resource allocation decisions that address which division, office, business function, or projects should receive funding.
- Operational decisions, such as: When to schedule maintenance? How to operate the facilities? How to manage the projects that are being developed?
- Human resource decisions, such as: What are the skills needed for a given position? What divisions do not use their employees efficiently? What training should be provided to employees?

The Guidebook provides a short primer (Chapter 2) on performance management and a focused and detailed set of insights (Chapters 3 through 6) that describes how other agencies bring performance management into the decision-making process. As transportation agencies tackle both major choices about strategies, projects, and programs as well as everyday decisions about operations and personnel, performance management can help ensure both that DOTs "do the right thing" (i.e., that they make the right investments) and that DOTs "do things right" (i.e., that they efficiently use the limited resources they have).

What is Performance Management

The conceptual model used within this Guidebook is of a three-part process that consists of strategic planning, performance management, and reporting. All three are closely linked and, in most agencies, it is difficult to pull them apart. And though no agency uses this exact structure, all of the agencies reviewed in this Guidebook used some formulation of these basic processes within their performance management programs.

Figure S.1 presents the overall approach to performance management as captured by the research effort. Throughout the implementation of this process, there is a recognition that three basic considerations—customer needs and desires, engineering requirements and limitations, and fiscal limitations—shape each of the key processes.

The basic elements of the proposed approach are described in the following paragraph:

- **Strategic planning** involves identifying what an agency hopes to achieve. It includes setting visions, goals, and objectives and defining agency initiatives to improve system performance. It uses performance measures to help make these important decisions.
- **Performance management** is the regular ongoing process of selecting measures, setting targets, and using measures in decision-making. Though measures and targets are likely only set on a periodic basis (i.e., every year or every other year), their use in decision-making requires constant review of the data and methods used to determine performance.
- **Reporting** is a key component in developing a culture of performance throughout the DOT. Frequent public reporting of results can produce numerous positive results, including: building credibility, accountability, and trust between the DOT and its constituencies; strengthening support for budget and program proposals; and promoting friendly competition and information sharing between districts and offices that experienced differing results.

Why Should a Transportation Agency Care about Performance Management?

Performance management is a concept of growing importance. More and more state legislatures are requiring performance measures to back up not only transportation decisions

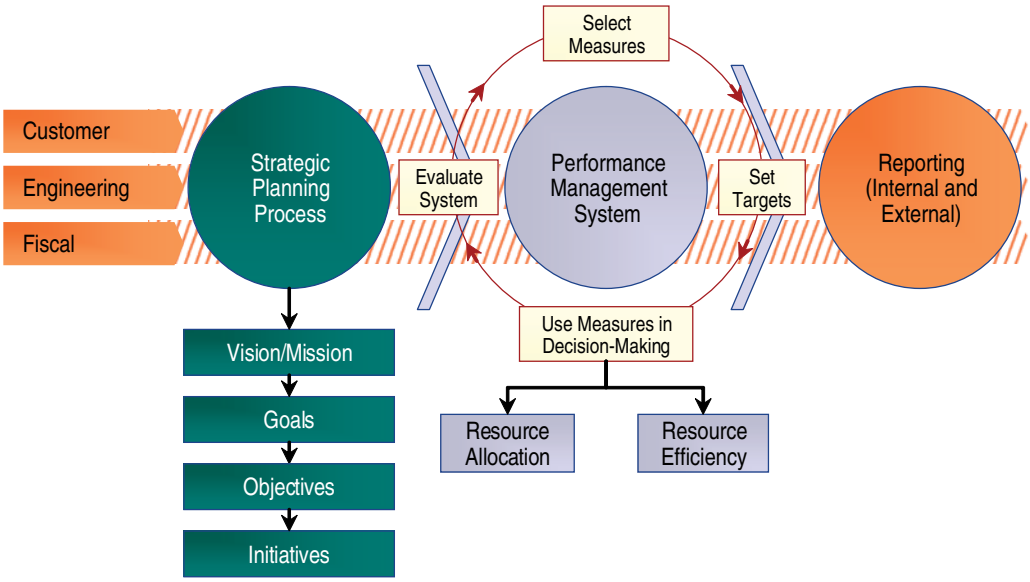

Figure S.1. Performance management structure.

but all governmental decisions. Increasingly, federal legislation, such as the American Reinvestment and Recovery Act (ARRA), requires tracking the performance of governmental projects and programs. There is a growing consensus that the next Federal surface transportation reauthorization will include national tracking of performance and specific performance management requirements to be implemented by states and metropolitan planning organizations and may even identify specific goals and targets. A recently proposed version of this legislation developed by the House Transportation and Infrastructure Committee includes many principles of performance management (including measuring performance, setting targets, requiring the planning process to support performance measurement, and others); and stakeholder positions (e.g., the American Association of State Highway and Transportation Officials, the American Association of Metropolitan Planning Organizations, and others) are supportive of requirements to track and report performance of the transportation system, though the specifics of individual proposals vary significantly. This Guidebook can help a transportation agency develop the necessary organizational framework to be prepared for future performance management requirements.

Beyond potential requirements, states are also facing greater challenges and less funding to address them. The combination of Federal and state requirements, aging infrastructure, and interest groups who pay close attention to how governments spend their tax dollars, have increased the need to program agency funds in ways that are effective (i.e., they get the job done) and efficient (i.e., they represent smart use of funding). The 2009 economic recession, which made it challenging for transportation agencies to even retain their staff, created additional challenges. Performance management can help transportation agencies make the best use of their resources and provide evidence to state legislatures of the need for additional funding.

Finally, system users are demanding more information. Changing technology and increased information accessibility have expanded the demand for information about transportation system performance and governmental activities generally. Performance management can provide agencies with valuable tools in communicating with the public and stakeholders. Having readily available data and information about the performance of both the agency and the transportation system can help the public and stakeholders understand the progress that agencies are making to address performance and the challenges that transportation agencies face.

Insights to Successful Performance Management

Every transportation agency is a unique combination of existing organizational structures, geographic and demographic circumstances, and history. It is not possible to develop a single model for how a transportation agency should be operated or to develop a simple performance management recipe that applies in every case. The insights in this Guidebook are not meant to be applied as a whole. Instead, the Guidebook provides a menu of approaches that individual agencies can adapt to their specific circumstances.

The Guidebook is organized around four broad insights and numerous specific insights from transportation agencies that are implementing performance management initiatives. The following sections discuss each of the four broad insights.

Use Performance Management to Help an Agency Focus

When initiating a performance management system, it is vital to focus measurement efforts on the agency's highest priorities. Successful performance management initiatives are typically born out of specific agency challenges, rather than an interest in improving management.

These programs use an incremental, responsive, and transparent approach to build and grow their performance management systems. As performance management programs grow and evolve, agencies can use measures to identify and to diagnose additional challenges.

The key insights from agencies that described how performance management helped them focus included the following:

- **Initiate a performance management program to identify and address or avoid a compelling problem.** Performance management is not an end in itself, but a means to focus an agency on specific priorities. Although these priorities can be determined at multiple levels, the initial focus should be on broad agency goals. A performance management program will not sell itself on its own merits but instead needs to demonstrate how it can help an agency address specific challenges. State DOTs often note that they have a hard time keeping performance management on the agenda. Performance management itself should not be on the agenda but instead should be a means to help deliver results on whatever important challenges an agency faces.
- **As a program develops, use measures to diagnose problems.** As an agency identifies key problem areas and desired outcomes, a detailed review of the underlying reasons for the problems is needed. Some issues can be solved quickly with creative thinking by DOT staff, while others may be more severe and require a more comprehensive evaluation. Performance management should help agencies understand the causal relationships between the decisions they make and the outcomes they see on the system.
- **Support performance management with a nimble strategic planning process.** Strategic planning is the foundation of performance management. A nimble strategic planning process focuses an agency on a limited set of short-term outcomes tied to specific performance measures. Strategic plans are less important than a process that identifies an agency's most compelling problems and lays out a path to address them. Being comprehensive is less important than providing direction.
- **Use performance management to improve agency transparency.** The goal of performance management is to tackle difficult problems and improve the agency, not to provide public relations material. Agencies must work through resistance to present negative results and must recognize that performance measurement will not only highlight improvements but also may uncover chronic problems. As part of focusing the agency, it is important not to avoid these difficult challenges.

Performance Management Must Engage with Employees

Employees are the lifeblood of a transportation agency, and any new management initiative will only be successful if all levels of employees are included in the process. One focus of performance management is on improving the efficiency of transportation agency operations. Efficient operations require employees to understand the challenges that the agency faces and the program that the agency is initiating to address those challenges. Performance management should ensure that all staff are accountable for system performance.

The key insights from agencies that described how performance management helped them engage with employees included the following:

- **Senior management must support the program.** Strong leadership from a DOT's chief executive or from senior management is almost always a defining factor in the success of any DOT's performance management initiative. Although performance management cannot be accomplished solely through a simple top-down directive, agency leaders must set the tone and demonstrate that measuring performance and instituting a performance-based decision framework is going to be a priority at the agency. The most effective way to set the tone is to make regular use of performance data and reports.

- **Hold staff accountable for agency performance.** When employees understand that their job performance is gauged in part by the outcomes of appropriate performance measures, they are much more apt to see the "big picture" in their work and to find management strategies that influence results. A crucial component of performance-based management is cultivating an agency philosophy that stresses the idea that "we're all in this together." Increasingly transportation agencies are using system performance outcomes as one metric of employee performance. This helps staff understand the ultimate system outcomes to which they contribute.
- **Empower staff to take ownership of the program.** Performance management programs must provide opportunities for individual staff to take action. Performance management's focus on improved efficiency requires an environment where individual employees can have a positive impact on the way the agency operates. Employees should receive training, be provided access to performance data, and be encouraged to recommend and enact solutions. An agency's most valuable resource is its personnel, and providing individual staff members with the information, the environment, and the confidence to take on challenges is the best strategy to encourage creative problem solving and foster a culture of shared responsibility.
- **Employee challenges are inevitable.** Performance management means changing the way an organization conducts business. As these programs are implemented and individual accountability and responsibility is increased, resistance should be expected. DOTs have to find ways to find performance management champions willing to take on new responsibilities.

Performance Management Requires a Customer Focus

Performance management requires transportation agencies to think of the users of the transportation system as customers and to work to understand their perspective when developing both transportation programs and the measures used to evaluate them. In an era of easily available information, an important component of a program is providing access to the public in terms that they can understand and addressing the issues that concern them.

The key insights from agencies that described how performance management helped them provide a customer focus included the following:

- **Align performance targets with customer expectations.** While DOTs have strong ideas and readily available data to define performance, defining customers' expectations is often fuzzy. In the area of congestion, for example, customers may care generally about a combination of travel speed and trip reliability, but DOTs may lack good information about what customers believe constitutes a satisfactory speed or level of reliability. As a result, even with the right measures in place, DOTs often struggle to set performance targets that match customer expectations. If the agency sets its congestion targets too low, customer satisfaction may fall, but if it sets the targets too high, funds may be spent unnecessarily on achieving less congestion than customers care about. DOTs can address this challenge by making better use of feedback from customers to help set performance targets.
- **Learn how to better balance multiple constraints in decision-making.** DOTs do not have the luxury of unlimited funding for transportation. Sound engineering principles, however, still dictate fundamentals that must guide the safe design, construction, and operation of every project. Not only must a DOT balance fiscal responsibility with good engineering judgment, but it must find ways to keep customers satisfied as well. Transportation agencies must use a broad perspective and understand when it is appropriate and safe to relax specific requirements that may not provide the service or investment that customers expect or need.
- **Build agency credibility via modest, customer-focused "quick fixes."** A DOT's credibility with stakeholders is a precious asset. It is arguably as essential to building and maintaining transportation infrastructure as concrete, asphalt, and smart employees because it enables DOTs to work with the public, the business community, and legislative and governmental

bodies to achieve strategic objectives like securing funds to meet critical transportation needs. Credibility is hard won and easily lost. Performance management can help DOTs identify low-cost/high-value solutions that quickly help boost or restore their credibility. Although agencies must tackle their most significant challenges, addressing larger problems may require first establishing credibility with stakeholders and the public by making investments that show system performance improvements.

Sustain Performance Management by Building Constituencies

Although the support of an agency's CEO is often crucial to get a performance management program started, the true mark of a successful program is one that survives changes in political administrations and CEOs. Performance management programs that last typically have a wide range of supporters and data users, including legislatures, the public, interest groups, and others, in addition to the administration. Many transportation agencies that have successfully implemented performance management are able to pitch the usefulness of the program and data to new administrations who can set their own priorities, but continue to manage their programs using data and analytic techniques.

Key insights from agencies that have sustained performance management included:

- **Senior management must work to institutionalize performance management.** Performance management is often spearheaded by a CEO or senior manager who seeks to solve serious agencywide management challenges. DOTs sometimes find that the senior management leadership can also "brand" a performance management program with its champion's identity. As a result, an incoming leader may be tempted to make his or her administrative mark by charting a course away from performance management or restarting a program, setting back its development by several years. DOTs that have successfully carried performance management forward across administration changes report an ability to institutionalize performance management in several ways.
- **Ensure many DOT managers and employees are involved in performance management.** DOTs often rely on a small performance measurement work unit to perform day-to-day performance management functions and to act as a point-of-focus for the agency's overall activities. Such an office, however, may run the risk of creating a perception among other DOT staff that performance is not their responsibility. Most successful performance management programs build on bold leadership by engaging the next tier of leaders at the DOT to act as ambassadors and champions to the agency's entire staff. Without this kind of engagement, a performance program is unlikely to outlast its leader.
- **Use performance management to build bridges with state legislators.** Many state DOTs have developed performance management efforts in response to legislative mandates although a few have taken on performance management on their own initiative. However a program is established, the state legislature is an important audience for their performance results. Involvement by the state legislature, however, can be a double-edged sword. Some DOTs struggle to meet unwieldy performance mandates while others have found that an in-house performance management program can be an important tool for improving their relationship with the state legislature. Taking initiative to establish a performance management system and working with the legislature to define the requirements for performance reporting can help ensure a successful, long-lasting program.
- **Make performance management efforts visible to the public.** Performance management programs have both internal and external audiences. Performance results are discussed internally at management meetings and are also presented publicly in regular reports. The external audiences for these results can include business groups, legislators, the public, and advocacy groups. High external visibility helps hold DOT managers accountable and creates anticipa-

tion for results among key stakeholder groups. Once performance results begin to be reported and understood by news media and stakeholder groups, it becomes difficult to stop reporting performance.

Implementation

The performance management programs reviewed as part of this research each began in unique circumstances. Though there are clear common elements, there is no one single pattern of implementation that can be described in a guidebook. The patterns that individual agencies followed may provide useful examples for an agency considering a performance management program, but it is likely that any agency reading this Guidebook will be interested in a unique selection of the insights described.

Four general implementation stages have been identified for a performance management initiative. In practice, few agencies have (or are likely to) approach performance management in a simple linear fashion. Many agencies already report measures or have pieces of a program in place. Regardless of where an agency finds itself within each of these steps, key questions within each of the following four broad areas are likely to be useful in implementing a program:

1. **Initiate.** In this step, agencies define the need for performance management, its role within the organization, and who will be responsible for managing the effort.
2. **Design.** During the second step, an agency selects measures and targets, develops reporting mechanisms, and provides an overall approach for the program.
3. **Execute.** The next step in the process involves performing the mechanics of the performance management program. This step includes collecting and/or compiling data, calculating the measures, and generating and distributing reports. These activities represent a sustained effort that must be performed on a continuous basis throughout the life of the performance management program.
4. **Apply.** The final step in the implementation model involves using the performance results to make better decisions. Similar to the Execute step, the "Apply" step represents a sustained long-term commitment. The main difference between these two steps is that *using* performance results requires agencies to address organizational, institutional, and cultural issues that go well beyond the logistical challenges of *calculating* them.

The focus of this Guidebook is primarily on what happens in the last step—the application of a performance management program to actual decisions. The insights in this Guidebook can help improve decision-making, but agencies looking for a more fundamental primer on performance measurement may want to supplement this Guidebook with other resources. Several existing reports developed by NCHRP may be especially useful for initiating a new program, including the following:

- *NCHRP Report 446: A Guidebook for Performance-Based Transportation Planning* provides an introductory primer to help agencies integrate performance measures into their long-range planning efforts and improve the development, implementation, and management of their transportation plans and programs to support agency goals and objectives.
- *NCHRP Report 55: Performance Measures and Targets for Transportation Asset Management* reviews performance measures to support asset management and provides a framework for setting targets.
- *Strategic Performance Measures for State DOTs—A Handbook for CEOs and Executives* provides a primer for state DOT executives considering implementing performance management within their agencies. It identifies the key building blocks to help link performance measurement to strategic planning.

These are just a few reports that address performance management in transportation agencies. This Guidebook builds on this effort by delving more deeply into the decision-making process to help understand what it takes for measures to get used by transportation agencies on a day-to-day basis.

The guidance reported here builds on these previous efforts by examining transportation agencies that have been relatively successful in implementing performance management programs. The review has produced a menu of insights that other agencies can draw from to implement their own programs.

CHAPTER 1

Introduction

Performance management is the systematic process by which an agency involves its employees, as individuals and members of a group, in improving organizational effectiveness in order to accomplish agency goals based on performance data analysis. Over the last two decades, state DOTs have become more adept at using performance management to help meet important organizational goals like keeping bridges safer, reducing highway deaths, and taming congestion. This report offers insights from leading state DOT practitioners on how to get the most from performance management.

1.0 Benefits of Performance Management

Proponents of performance management say it helps their agencies make difficult decisions about setting long-term policy priorities ("doing the right things") as well as where and how to apply day-to-day staff and capital resources, ("doing the right things well") and it helps them become more accountable to external stakeholders. The following are benefits of performance management:

- **Performance management helps agency leaders set a strategic agenda and motivate staff.** Good leaders keep their organizations focused on the highest business priorities. Nuanced and objective performance data help them understand challenges and set appropriate policy priorities. At a transportation agency, for example, analysis of data can reveal where performance is inadequate in key focus areas like pavement condition, fatalities, congestion, project delivery, or maintenance, and this information can be used to set a strategic agenda. Armed with a performance-driven strategic direction, leaders can confidently energize staff and focus resources around key policy priorities—such as reducing fatalities or alleviating congestion—to maximum effect.
- **Performance management helps agency managers improve business processes.** Strong performance emerges when day-to-day business processes are aligned with well-thought-out agencywide strategic priorities. In large public bureaucracies, business practices that have neutral or even adverse impacts on performance can easily become routine. Careful scrutiny of lagging and leading performance indicators reveal new insights on how to perform tasks and help agency managers make better day-to-day decisions about how to direct staff and resources to achieve outcomes that are more closely aligned with the agency's overall strategic agenda for achieving improved performance. At a transportation agency, for example, annual pavement survey data in combination with predictions about future performance can be used to assess the validity of alternate approaches to managing asset conditions such as the use of thinner overlays or new materials formulations. In Kansas, greater scrutiny of maintenance quality data has revealed new ways to address maintenance in a more cost-effective manner.

- **Performance management helps improve accountability to external stakeholders.** Accountability is a fact of life for public agencies. Transportation agencies that ignore the expectations of elected officials, advocacy organizations, or the public run the risk of stimulating adversarial relationships that drive up the risk of negative policy mandates and reductions in funding. But agencies that are able to provide stakeholders with timely and compelling performance-based information about important issues can increase credibility and ensure a positive environment for setting policy and funding direction. Performance management provides data and analysis that helps improve the transparency of decision-making.

In this report, transportation practitioners share their insights on how to implement a performance management program that can achieve these kinds of benefits.

1.1 Purpose of the Guidebook

Several recent NCHRP-sponsored research reports provide guidance to transportation agencies on either starting performance measurement programs or important functional topics, such as performance measurement practices for asset preservation, congestion relief, safety, and context-sensitive solutions as well as others. These reports offer many valuable insights on challenges such as selecting appropriate measures, organizing for performance, and setting performance targets. But transportation agencies that have mastered the basics of choosing performance measures and organizing themselves to monitor results sometimes struggle to translate performance data into meaningful actions that enable business process improvements.

This Guidebook builds on the existing body of knowledge to provide a source for sensible tips and ideas—gathered from leading state DOTs in the field of performance management—on how to transform a basic performance measurement initiative into an effective performance management system that helps improve organizational effectiveness in accomplishing agency goals.

Readers of the Guidebook are likely to work for transportation agencies that already use basic performance measures to analyze the condition of their transportation network but are seeking to learn more about how their peers use performance information to manage business process improvement and enhance accountability. Those seeking general guidance on how to start a basic agencywide performance measurement initiative are encouraged to first consult the listing of publications described in Exhibit 1.1.

Exhibit 1.1. Selected resources on DOT performance management practices.

Strategic Performance Measures for State DOTs—A Handbook for CEOs and Executives, American Association of State Highway and Transportation Officials, Washington, D.C., 2003. http://downloads.transportation.org/Quality-CEOHandbook.pdf.

Effective Organization for Performance Measurement, Transportation Research Board of the National Academies, Washington, D.C., 2006. http://www.transportation.org/sites/planning/docs/NCHRP%208-36%2847%29%20Final%20Report.doc.

NCHRP Report 446: A Guidebook for Performance-Based Transportation Planning , Transportation Research Board of the National Academies, Washington, D.C., 2000.

Managing for Results: Enhancing Agency Use of Performance Information for Management Decisions; Government Accountability Office, Washington, D.C., 2005. http://www.gao.gov/new.items/d05927.pdf.

NCHRP Synthesis 326: Strategic Planning and Decision-Making in State Departments of Transportation, Transportation Research Board of the National Academies, Washington, D.C., 2004. http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_326.pdf.

Poister, T., D. Margolis, and D. Zimmerman, *Strategic Management at the Pennsylvania Department of Transportation: A Results-Driven Approach*, *Transportation Research Record 1885,* Transportation Research Board of the National Academies, Washington, D.C., 2004. http://trb.metapress.com/content/k0v0nn40x7x3l371/.

1.2 Guidebook Development

The information presented in this Guidebook was gathered via the following three-step process, including a basic review of the literature on performance measures, detailed interviews with six case study transportation agencies, and in-person practitioner reviews of the draft final Guidebook with four agencies:

- **Performance management literature review.** Considerable research has been produced on how to choose transportation-related performance measures. This section summarizes a small number of studies that focused on using performance measures in transportation decision-making. The literature review completed for this project covered the following general areas:
  - A limited review of Federal government agency-level performance measurement-related research reports, focused particularly on work by the U.S. DOT and its modal administrations;
  - A full review of state transportation agency-level performance measurement-related research undertaken by the National Cooperative Highway Research Program, the Transit Cooperative Research Program, university transportation centers, as well as research by individual state departments of transportation;
  - A limited review of performance measurement-related research work performed by state and local nontransportation agencies, private-sector organizations, transit agencies, metropolitan planning organizations, local governments, and nonprofit agencies; and
  - A limited review of performance measurement research work performed by non-U.S. transportation organizations.
- **Performance management case studies.** The six case studies used to develop this Guidebook were selected from a list of over 30 organizations known to be using a mix of established and emerging performance management practices. The list included details about a large number of state DOTs, several transit agencies and metropolitan planning organizations, local governments, and some non-transportation organizations for which information was readily available. Final case study candidates were selected from the listing based on input from the project's panel members and according to the following criteria:
  - Focus on states with an emphasis on accountability-driven performance management, which is generally considered to be more sophisticated than basic performance tracking efforts;
  - Highlight unique practices and applications of performance management that are considered the state-of-the-art in performance management;
  - Examine state DOTs that have not been highlighted by previous research efforts because they provide new perspectives on performance management; and
  - Include non-DOT organizations in order to provide an outside perspective on how agencies can use performance management to improve their practices.
- The six case studies are shown in Table 1.1. Each case study included initial background research, personal interviews with selected staff, and preparation of a final write-up. Complete write-ups for the case studies are available as part of the final report for this project.

  Background research was used to develop an interview guide tailored to each state that focused on a limited number of areas where the case study agency offered the greatest potential for lessons learned. Interviews were conducted by telephone or in person with selected agency managers. Several individuals were contacted for each case study to ensure multiple perspectives were considered. Questions focused on types of decisions made by the agency; types of measures crucial for decision-making; links between measures and decisions; challenges and barriers in using measures in decision-making; and successful uses of measures in decision-making. Interviewees were given an opportunity to review and comment on the write-ups.
- **Performance management guidebook practitioner review.** A draft version of the Guidebook was reviewed in four practitioner review sessions at state DOTs that were not directly involved in the research effort. Each review session involved several members at the DOT; sessions were structured as a two-way exercise that included a presentation from the research team on the

Table 1.1. In-depth case studies.

	Accountability Focus	Advanced Practices	New Experiences	Non-DOT
Florida DOT	Yes	Aligning goals and measures throughout organization	Frequently cited	No
Missouri DOT	Yes	Pay for performance	Infrequently cited	No
Ohio DOT	Yes	Linking organizational measures to personnel reviews; asset management	Infrequently cited	No
PACE Suburban Bus	Yes	Performance-based route selection	Not cited	Yes
Virginia DOT	Yes	Dashboard; project tracking; managing internal operations	Frequently cited	No
Washington DOT	Yes	Reporting; project tracking; maintenance; congestion evaluation	Frequently cited	No

Guidebook and presentations by the DOT on the current state of their performance management efforts. Feedback from the practitioner review sessions was incorporated into the final Guidebook. Practitioner review sessions were conducted at the Georgia, Indiana, Kansas, and New Jersey DOTs.

1.3 Guidebook Structure

The remainder of the Guidebook discusses ways to implement performance management in core business functions relevant to DOTs:

- **Chapter 2** addresses the basic structure of a performance management system and how it fits within the overall management structure of a transportation agency;
- **Chapters 3 through 6** provide insights from practitioners for linking performance measures to decision-making and provides examples from the case studies conducted for this research effort; and
- **Chapter 7** offers some lessons learned and discusses challenges to implementation of performance management programs.

CHAPTER 2

Performance Management Structure

This chapter discusses the basic structure of performance management, the role of performance management in overall agency management, and how transportation agencies use performance management to address the many challenges that they face.

Figure 2.1 summarizes the basic relationship between performance management and two other key processes that are not the primary focus of this Guidebook—strategic planning and reporting. Though not necessarily organized within a transportation agency in this fashion, the implementation of these three broad concepts within the management of a transportation agency is necessary to ensure the implementation of performance management. Together, the three components establish the foundation for a continuous cycle of identifying priorities, allocating resources, refining agency practices, managing staff, and maintaining accountability to the public. Though each process has its own timeframe and cycle, there are important links between performance management and strategic planning and between performance management and reporting that are discussed throughout this Guidebook. However a transportation agency chooses to organize itself, the links described in this section were common to the case studies conducted as part of this research effort.

Strategic planning at a DOT is generally driven by three interests (shown on the left side of Figure 2.1):

1. The agency's customers and their needs;
2. Engineering and other DOT programmatic requirements; and
3. The principles of fiscal responsibility and efficiency.

Performance management provides support for the strategic planning process by helping transportation agencies make decisions based on meaningful data that touches upon all three of these interest areas. Tracking and reporting performance data helps agency executives to understand the impacts of investment decisions and agency practices on the state of the transportation system and the system's impact on other social, natural, and economic systems. It also provides the key inputs that can and should be used to establish priorities during subsequent strategic planning phases and to measure progress on previous strategic goals.

The following three sections briefly describe the subordinate components of each of the three processes shown in Figure 2.1, how the processes relate to one another, and the role of performance measures in each. Finally, Section 2.3 introduces the "Insights" that are presented in the subsequent four chapters of the Guidebook.

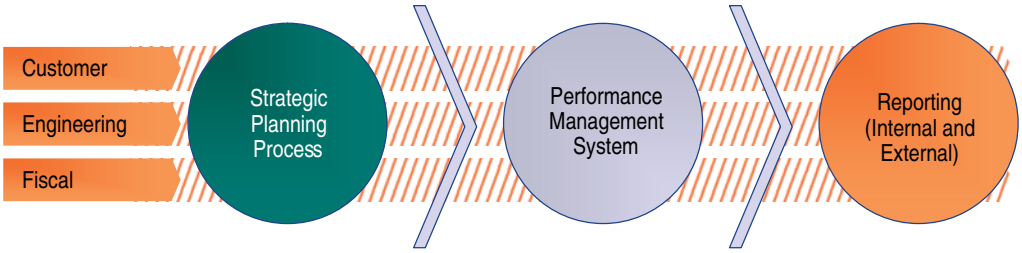

Figure 2.1. Key DOT management processes.

2.0 Strategic Planning

Strategic planning is the venue through which a DOT articulates its vision for both leadership and employees for the future, identifies challenges, prioritizes goals, and sets achievable short-term objectives for meeting them. This process does not need to be over involved and complex but is an important means to focus the agency on its key challenges and opportunities.

Performance management practice suggests that performance measures and decisions should be connected to an agency's strategic planning process, which typically includes four basic components of development: vision/mission; goals; objectives; and initiatives and implementation strategies (Figure 2.2).

Measures can play a central role in developing this framework through at least three specific contributions:

1. Illustrating past performance,
2. Establishing the framework by which outcomes are gauged, and
3. Tracking progress towards goals.

Most agencies already have a strategic planning process in place that may contain some or all of the components described in this section. Whether or not the process already is performance-based, it should be dynamic, ongoing, and responsive to new challenges or shifts in agency policy. Therefore, it is never too late to integrate a performance-based approach into strategic planning. The uses of performance management that are described in this section can be applied

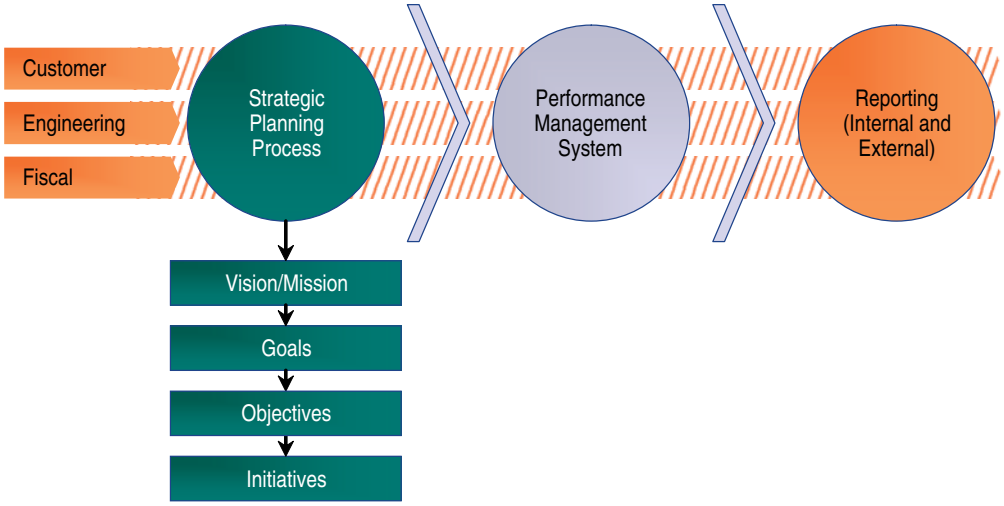

Figure 2.2. Strategic planning structure.

to an existing and ongoing strategic planning framework at any time. Improvements can be realized incrementally, and it is unnecessary to revise the process from the ground up.

2.0.1 Developing a Vision or Mission

An agency's mission or vision is the set of foundational principles that guide all of its policies and business decisions. A mission should be broad enough to encompass the agency's entire breadth of responsibilities, while specific enough to suggest actionable goals and objectives. As discussed in Section 3.0, the best strategic plans directly target the particular challenges that an agency faces, such as a funding crisis or a track record of unreliable project delivery. In some ways, the process by which a vision is developed can be as important, or even more important, than the vision statement itself, because of the conversations and critical questions that precede and inform it. Performance measures, including qualitative measures from instruments such as customer surveys, can provide critical input for agency executives seeking to identify where improvements are most needed and where the agency might be neglecting its responsibilities or falling short of expectations. For example, many DOTs until recently failed to recognize their constituents as "customers," a failure likely to manifest itself in user surveys revealing a lack of faith or trust in the agency. An appropriate first response to this particular challenge would be revising the mission statement to reflect "a focus on customer service" or similar sentiment.

2.0.2 Developing Goals

While an agency's mission can remain the same for a long period of time (although it does not have to), its goals can and should change as necessary in response to new or evolving challenges. Performance measures should directly inform the development of goals by highlighting troubling trends and particular agency challenges. Goals should address a variety of facets of the agency's performance, including external performance (state of the system, project delivery, customer satisfaction, etc.) and internal performance (human resources, communication, employee satisfaction, etc.).

2.0.3 Developing Objectives

One of the characteristics of an effective strategic plan is that it contains a limited number of achievable, measurable, objectives to be realized within a few years. Developing objectives is the step in the strategic planning process where specific desired outcomes are defined and sometimes quantified. Strategic objectives will ultimately determine the measures that are used to gauge success. Thus, it is important to set objectives that *can* be measured.

An example of a specific, achievable, and measurable strategic objective comes from Missouri, where in 2004 the DOT set a target of reducing highway fatalities to below 1,000 in 2008. The specific focus on fatalities reflected an agency priority that came out of a collaborative strategic planning process and represented a shift from the more traditional focus on crashes per vehicle-miles of travel (VMT). For more examples of how an agency can use strategic planning and performance management to hone in on key agency goals, see Chapter 1.

2.0.4 Developing Initiatives and Implementation Strategies

Strategic initiatives and implementation strategies are used to help orient the agency towards achieving desired outcomes and fostering informed and responsive decision-making. This is the step where agency goals and objectives are linked most closely with performance-based decision-making and resource allocation. Goals are in place, specific measurable objectives have been set,

and in this final strategic planning step the agency establishes a set of regularly updated policies and procedures that build on one another and are oriented towards improving system performance.

One key concern in developing a strategic plan is that it must "have teeth." If no one follows it, a strategic plan is worse than useless: the time spent creating it could have been spent on something else. Thus one key area to be addressed in the strategic implementation stage is establishing accountability for the goals and objectives. This can be accomplished by linking each objective, target, and/or measure to a specific manager within the agency (or within each district) and establishing a regular measure review schedule. Other initiatives to drive accountability include the development of dashboards, holding regular agencywide performance review meetings, and other public releases of performance data.

Initiatives should define key leading indicators that will help an agency know if they are making progress towards meeting their stated objectives (the actual results will eventually be captured by lagging indicators). For example, several state DOTs have developed predictive models for their pavement programs and can use these models to track incremental investment in areas such as pavement quality to predict whether overall quality will improve based on current expenditure levels. Their predictions will ultimately be validated against year-end results.

Other initiatives include developing new tools to improve data and information quality and reviewing the agency's organization to improve business practices and identify cost efficiencies. In some cases, a problem identified through strategic planning can be solved not through a reallocation of resources but through a change in practices. Agencies can encourage creative solutions by encouraging employees to be creative (some even hold innovation competitions) and creating forums to share ideas. Employees that present innovative ideas should be encouraged to demonstrate, with the use of performance measures, the benefits of their ideas.

2.1 Performance Management

Figure 2.3 presents the performance management system as a continuous cycle consisting of four key components: selecting measures, setting targets, making decisions, and evaluating the system. The third of these steps, using performance measures to make decisions, is the primary

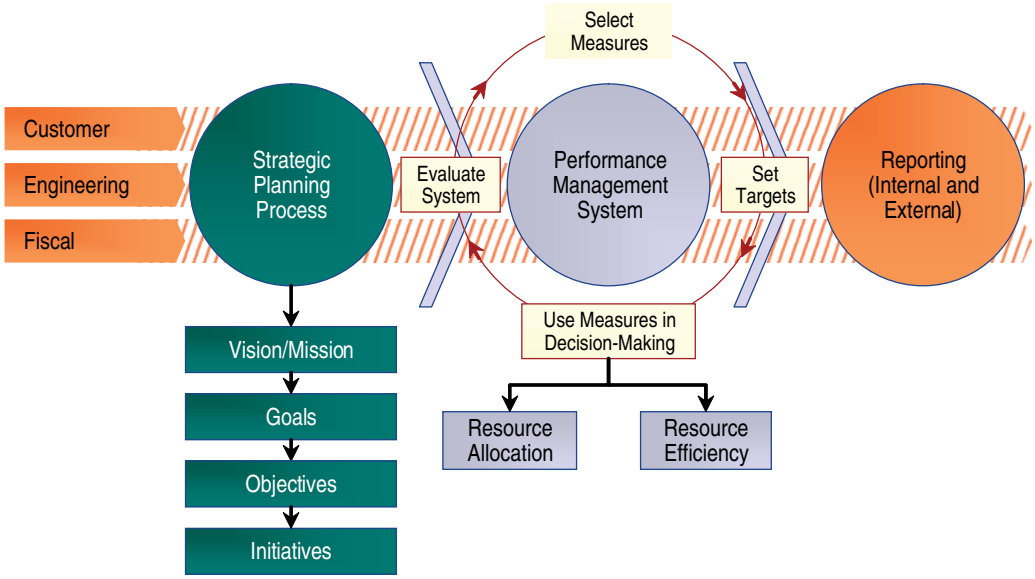

Figure 2.3. Performance management structure.

focus of this research. The two basic forms of performance-based decision-making that are influenced by a system are those that address *resource allocation* ("doing the right thing") and *resource efficiency* ("doing things right"). Performance management is the application of data, analysis, and innovation to support these decisions.

Although presented as steps in a process, in practice, agencies often complete these steps in a nonsystematic fashion, using whatever measures and data are on hand to make decisions. An incremental approach is normal and may be desirable if it means that an agency is addressing its most pressing challenges first.

2.1.1 Performance Management Life Cycle

2.1.1.1 Selecting Measures

Whether performance measures are selected in conjunction with strategic plan development or in a separate process, the strategic plan should serve as the guiding document in selecting performance measures. Measures should reflect agency goals and objectives, providing the data needed to answer the question, "how are we doing?" To the extent possible, measures should be outcome-oriented, meaning that they examine the impact of decisions made, rather than simply the amount of resources being devoted to a particular practice. Examples of outcome-oriented measures include pavement quality ratings, crash rates, congestion levels, air quality, and customer satisfaction.

Input- and output-oriented indicators, which directly measure the quantity of a service provided or the amount of resources devoted to a particular practice, are appropriate when they are used to estimate or predict progress towards a goal. For example, as discussed in the previous section, many agencies maintain predictive models for items such as pavement condition. In this case, an output-oriented measure such as the number of lane-miles of highway resurfaced offers a useful tool for predicting expected outcomes. These predictions can later be validated against year-end results and, in turn, used to better calibrate the predictive model in the future.

The measures that an agency chooses to collect and track data should be specific enough to directly address the objectives set out in the strategic plan. For example, systemwide pavement smoothness ratings do not distinguish heavily traveled Interstates from lesser-traveled state highways, nor crucial linkages from those that may have redundant alternate routes available. An alternate measure might examine pavement quality on a subset of the state's most important roads, such as Florida's Strategic Intermodal System. Ultimately, the specificity and relevance of an agency's selected measures are far more important than the completeness of its overall menu of performance measures.

It also is important to employ measures that can be tracked incrementally and compared against performance targets (see Section 2.2). Performance targets are often ambitious, and measurable incremental progress may be an important indication that the agency is doing the right things but needs to further step up efforts. Some agencies have actually developed "rate of change" measures that explicitly examine trends in performance.

One of the most significant challenges in selecting measures will be between consistency in measurement and evaluation and the desire to improve measures over time. As data collection and analysis improves, new measures will become possible that better reflect a particular outcome than whatever measure is currently in use. Regularly refreshing and updating measures is a necessary part of performance management, but these updates can have negative consequences for an agency. Agencies should be careful to update measures only when the new measures clearly improve the decision-making process. Maintaining existing measures helps provide continuity throughout the overall process and provides historical information that agencies can use to understand trends in performance.

2.1.1.2 Setting Targets

Performance targets are the gauges of success that support and advance an agency's strategic plan. Without them, objectives are abstract concepts. To be useful, targets must do the following:

1. Be ambitious enough to represent real accomplishments.
2. Be achievable. If a target is perceived as unrealistic, the motivation to pursue it may evaporate as resources are redirected towards more realistic goals.
3. Contain specific time horizons and be short-term enough that progress can be measured monthly, quarterly, and/or yearly. Ideally, targets that support strategic planning objectives should look no more than 2 or 3 years ahead.

2.1.1.3 Using Measures in Decision-Making

Ideally, performance management begins at the strategic level, where the setting of agency goals and objectives implies certain resource allocation priorities from the start. However, DOT decision-making is far more nuanced than simply deciding that a particular function or outcome, such as pavement smoothness, is where the agency will invest its resources. There are numerous business decisions made within individual divisions or business functions that can benefit from a performance-based approach. This research examines at least five types of management decisions, described in the following paragraphs:

- **Strategy Decisions:** Largely discussed in the previous section, these entail top-level decisions about where the agency needs to focus its resources and what types of approaches are most likely to yield positive results.
- **Resource Allocation and Programming Decisions:** Within a given division, office, or business function, performance-based resource allocation ensures greater consistency and accountability. This may be accomplished through development of a project prioritization tool, often used for such things as ranking highway investments. These tools generally utilize a number of outcome-oriented forecasts of a project's positive impacts, combined with lagging indicators that demonstrate the need for a project (congestion, air quality, economic conditions, etc.).

  In addition to making decisions about how to allocate resources, some agencies also have developed tools for determining where to allocate them at an aggregate level. For example, transportation assets in Florida are included in the State's multimodal Strategic Intermodal System (SIS) through a data-driven designation process. Investments in the SIS are determined through use of the Strategic Investment Tool (SIT), a performance-based project prioritization tool.
- **Operational Decisions:** Performance-based operational decision-making is focused on using resources more efficiently. This encompasses a diverse range of DOT issues such as incident response team deployment, road work policies and scheduling, and organizational initiatives.
- **Human Resource Decisions:** More and more agencies are recognizing that transitioning to a performance management program at a DOT involves a fundamental change in the way that employees at all levels understand the nature of their work and the importance of their individual contribution. One way to promote this "culture of performance" is to establish that each employee has a stake in the agency's overall success. In addition to holding managers accountable for their departments' performance, many agencies also have begun to hold individual employees accountable for agencywide performance through incentives and bonuses and by incorporating agency and department performance into individual employment reviews.

In all of these areas, it is important that performance management should support both effective decision-making (allocating funding, human resources, etc., in a way that matches agency priorities) and efficient decision-making (making the most of these resources once they are allocated).

2.1.1.4 Evaluating the System

Performance management should discourage complacency in a public agency that might otherwise be slow to embrace and adopt change. Likewise, the management system itself must be regularly evaluated and updated as necessary. The natural interaction between setting strategic agency priorities and selecting performance measures and targets will lead to changes in both priorities (as performance data demonstrate more effective or efficient courses of action) and measures and targets (as changing priorities require new measures or updated targets). Additionally, technological advances and feedback from employees and external sources may lead to the development of improved measures, more reliable collection methods, or an upgraded data system.

Although measures should be updated periodically to ensure consistency with agency priorities and strategic plans, there are significant benefits associated with maintaining a stable collection of measures. Internally, consistently collecting and reporting the same measure for several years enables the in-depth analysis of long-term trends. Externally, consistent measures can make it easier for stakeholders to fully appreciate progress that is being made or new challenges that arise.

2.2 Reporting

Performance reporting inevitably occurs as part of any performance management program, and the form and frequency of performance reports should not be an afterthought. Reporting performance is in itself a key component in developing a culture of performance management throughout the DOT. Frequent public reporting of results can produce numerous positive results, including:

- Building credibility, accountability, and trust between the DOT and its constituencies, including the public, the legislature, and the agency's own employees;
- Strengthening support for budget and program proposals;
- Promoting friendly competition and information sharing between districts and offices that experienced differing results; and
- Creating an expectation of continued reporting and incremental improvements which serves to solidify the performance program.

One overarching goal of performance management is to increase transparency and accountability of decision-making. Translating the analysis conducted as part of performance management into usable reports for legislators, stakeholders, and the public is an important component to the overall success. The insights presented in Chapters 3 through 6 describe some of these connections in more detail.

2.3 Introduction to the Practitioner Insights—Practices to Ensure Success

As stated throughout this Guidebook, every DOT's circumstances are unique. There is no one solution or one-size-fits-all, step-by-step implementation plan that can be applied to any agency at any time. The most significant differences among agencies include agency size, governance and oversight structures, the extent of existing performance measure and management programs, and the top-level priorities and challenges that underpin the agency's decision-making processes. As an agency undergoes the transition towards a more performance-based decision-making and resource allocation process, it must do so in ways that fit the individual needs and circumstances of that agency, its employees, and its customers.

The remainder of this Guidebook is devoted to providing DOT leaders with insights that will help them as they craft solutions to their unique challenges and address their agency's specific goals. The four chapters that follow describe the insights learned from practitioners about how performance management can help an organization improve the way it allocates and uses resources. These insights were synthesized from a combination of sources, including published research, agency reports, and interviews with agency officials. While the majority of the information comes from Departments of Transportation (DOTs), ideas and practices from other agencies, including local governments and a transit operator, are included where appropriate.

Each of the following four chapters covers a broad topic pertaining to the value of and applications of performance management: Organizational Focus (Chapter 3); Engaging Employees (Chapter 4); Engaging Customers (Chapter 5); and Sustaining the Performance Management Program (Chapter 6). Within each of the topics are three to four more focused insights, each of which is supported by specific guidance and examples from the research. The overall matrix of insights is shown in Table 2.1.

Table 2.1. Performance management insights matrix.

Topic	Insight
Use Performance Management to Help an Organization Focus	Initiate a Performance Management Program to Identify and Address or Avoid a Compelling Problem
	As a Program Develops, Use Measures to Diagnose Problems
	Support Performance Management with a Nimble Strategic Planning Process
	Use Performance Management to Improve Agency Transparency
Performance Management Must Engage with Employees	Senior Management Must Support the Program
	Hold Staff Accountable for Agency Performance
	Empower Staff to Take Ownership of the Program
	Employee Challenges Are Inevitable
Performance Management Requires a Customer Focus	Align Performance Targets with Customer Expectations
	Learn How to Better Balance Multiple Constraints in Decision-Making
	Build Agency Credibility via Modest, Customer-Focused "Quick Fixes"
Sustain Performance Management by Building Constituencies	Senior Management Must Work to Institutionalize Performance Management
	Ensure Many DOT Managers and Employees Are Involved in Performance Management
	Use Performance Management to Build Bridges with State Legislators
	Make Performance Management Efforts Visible to the Public

CHAPTER 3

Use Performance Management to Help an Organization Focus

This chapter describes insights from practitioners on how performance management programs can help transportation organizations focus on their unique challenges and particular problem areas. At the Kansas DOT, staff members noted that they face challenges keeping performance measures on their agenda when other significant issues (i.e., economic stimulus or developing a new program) take up attention and time. The following insights all address the idea that many successful performance management initiatives are born out of specific agency challenges, rather than simply an overt desire for performance management, and that an incremental, responsive, and transparent approach is crucial. As these agencies have responded to specific challenges, performance management has become the lens through which all challenges are viewed.

Performance management is a powerful tool for diagnosing and solving problems or avoiding problems in the future. In many cases, establishing a performance management program means imposing sweeping changes to an agency's business practices, and such changes are likely to be met with resistance. The first and best approach to overcoming such resistance is to develop a program that directly addresses the agency's most salient challenges. Often this will be obvious if an agency is facing a financial crisis or has recently endured potentially embarrassing failures such as project delivery problems, ethical issues, or spikes in traffic accidents. Regardless of the particular area of concern, it is far more important to address *that* issue thoroughly than to address *all* issues adequately.

Maintaining focus is the key to achieving desired outcomes. For example, "improving safety" may sound like an admirable goal for a DOT, but without greater specificity the agency might spend its resources reducing property damage crashes by 30 percent while fatalities continue to rise. If that outcome does not match the concerns of the agency and its customers, then those resources were allocated poorly.

Once broad agency challenges are identified, performance measures can help illuminate their underlying causes. Selecting the correct measures is a crucial step. The quality and specificity, of the measures selected is far more important than the overall number or breadth of available measures. The right mix of performance measures both identifies the underlying causes of particular problems and measures the agency's progress in mitigating them. An effective and responsive strategic planning process can help to identify short- and long-term goals that are relevant, achievable, and appropriate measures.

Finally, agencies should be prepared to share both positive and negative results, including an examination of factors that may not be within the agency's control at all. This ensures that the agency continues to understand its own performance in the context of the "big picture" and is adequately responsive to the needs and priorities of its customers.

At the Washington State DOT (WSDOT), the original impetus for a strong agencywide emphasis on performance management was an accountability crisis that occurred during the late 1990s in response to funding shortfalls, rapid growth in investment needs, voter repeal of a key revenue source, and erosion of trust between the department and the legislature. A new transportation secretary was brought in specifically to improve the agency's accountability through performance management. He emphasized a culture of performance management, accountability, and transparency.

At the Ohio DOT, growing consensus on the need for performance management arose out of an agencywide concern about possible large-scale outsourcing and privatization of agency responsibilities. In 1992, the governor launched a management audit of all state agencies, which was conducted by private-sector volunteers. Ohio DOT staff and management both recognized at that time that their jobs were in serious risk of privatization. In response, the Ohio DOT supported the Total Quality Management initiative, and management and staff jointly worked on a partnership to improve quality. Quality Service through Partnership has been written into the Collective Bargaining Agreement since 1992, and the Quality Office is a direct partnership between Ohio DOT management and the Ohio Civil Services Employee Association.

3.0 Initiate a Performance Management Program to Identify and Address or Avoid a Compelling Problem

Performance management is not an end in itself, but a means to focus an agency on specific priorities. Although these priorities can be determined at multiple levels, the initial focus should be on broad agency goals. A performance management program will not sell itself on its own merits, but instead needs to demonstrate how it can help an agency address specific challenges.

Begin by taking on the agency's most pressing challenges and potential problems. Many, but not all, of the programs evaluated as part of this research effort began as a response to a clear and present problem faced by the agency, rather than a broad desire for performance management by virtue of its own merits. However, a crisis is neither necessary nor sufficient, nor even desirable; rather, it highlights the need for better, more informed decision-making that could be achieved by other means. Popular support and an agencywide appreciation for the value of performance management greatly increase the likelihood of successful implementation of a program. To gain traction, a proposed program should initially highlight significant areas of concern that an agency wants most to address, and these areas of concern should be important to employees throughout the agency, not just the top executives. Budget shortfalls, chronic project delivery issues, lack of confidence in agency effectiveness, or highly publicized agency missteps are all potential drivers that might lead to the desire for a performance management program.

Use performance measures as agents for change. Just as performance management is most effectively implemented in response to specific challenges, the underlying measures themselves are most useful when they provide a laser-like focus on a DOT's most challenging problems. At the Virginia DOT, difficulty consistently delivering projects on-time and on-budget led to the agency's first "Dashboard," signaling the Virginia DOT's reengagement with a long-underutilized performance measurement program. The Virginia DOT has since greatly expanded its dashboard program, but its initial success was based on using performance measures to tackle a timely and potentially embarrassing agencywide challenge.

In order to avoid the risk of "diluting" the original objectives of performance management, agencies should resist attempts to institute performance management in every aspect of an agency at the same time, especially early in program development. Furthermore, within a particular agency function, the specific measures used should be tailored to the challenges at hand, even if the result is that certain aspects of that department or function are not measured.

Organize around a bold leadership initiative. Effective leaders either bring a performance management philosophy to their position or imprint their own leadership style on an existing program. Particularly when performance management is implemented in response to concerns about agency accountability, it is often in conjunction with changes in leadership.

To emphasize that a fundamental change is taking place in the way the agency does business, it is helpful to accompany these changes in philosophy

and leadership style with a bold and identifiable new agency program or initiative. These initiatives must involve both leaders and staff. Many agencies that have successfully implemented performance management have done so through the introduction of a new agencywide initiative specifically aimed at promoting performance and accountability. Examples of this include the Total Quality Management program at the Ohio DOT (see sidebar), the introduction of dashboards at the Virginia DOT, and the widely cited and often-emulated Baltimore CitiStat program, which was initiated, led, and overseen by Mayor Martin O'Malley. In the interest of longevity and long-term consistency, it also is important to design programs that are insulated against the inevitability of top-level administration turnover, discussed further in Chapter 6.

Focus on initiating a performance management program, not on completing it. No agency examined as part of this research had a finished performance management program. In fact, it is doubtful that a "complete" performance management program is even possible or desirable. Rather, successful systems build on initial successes and continually refine their program, performance measures, and supporting data. Continuous improvement includes changes to goals and objectives based on data analysis, improvements in data collection and use, changing fiscal or political constraints, and others.

3.1 As a Program Develops, Use Measures to Diagnose Problems

Performance management programs should always begin by addressing fundamental challenges and the outcomes that are sought in mitigating those challenges. Once the agency, with the help of performance measurement, identifies problem areas and desired outcomes, a detailed review of the underlying reasons for the problems is needed. Some issues can be solved quickly with creative thinking by DOT staff, while others may be more severe and require a more comprehensive evaluation.

Seek to understand the causal relationships that underlie an agency's programs. Once a performance management program is initiated, it is important to move beyond high-level outcomes to more detailed, problem-specific outcomes. Agencies should seek to build a logical understanding of the connection between the inputs and outputs supporting each outcome and how they help inform decision-makers. A well-developed complement of performance measures serves to illustrate that connection, especially over time. Many DOTs, including Florida and Arizona, have developed predictive models for their maintenance programs that are used to demonstrate the relationship between future investment levels and expected performance. The Kansas DOT has used performance management to generate new thinking about problems, such as a new bridge classification system that is easier to understand.

Measure and manage performance at multiple levels. There are many levels within any agency or state government, and approaches to reporting and using performance data will vary among them. For example, legislators or the public may only be interested in the "tip of the iceberg" (the most critical and easily understood output- and outcome-oriented performance measures), while district managers should apply the same performance management principles to drill down into more specific functions of the organization, building a better understanding of where their problems lie.

Prior to 2004, the Missouri DOT (MoDOT) experimented with a system of performance "dashboards," but interviews with staff members indicated that the agency's leaders were not focused on performance management, and the dashboards received only limited attention from staff and managers. Since recommitting to comprehensive performance management in 2004, MoDOT has constructed a program that centers on "Tangible Results," using simple language to describe agencywide strategic goals in terms of desired outcomes. MoDOT's measures are designed to be as clear and direct as possible, maintaining a clear connection to the Tangible Results on which they are focused. The primary measure for safety, for example, is the absolute number of deaths on the road each year, rather than more commonly used—but also more abstract—measure of fatalities per 100 million VMT, which can fall even as fatalities are rising. By maintaining a strict focus on the original area of concern, MoDOT realized its goal of an absolute reduction in fatalities, even as total crashes, a secondary area of concern, increased.

Oregon DOT is in the process of implementing a performance management program for its Highway Division. As part of this process, the DOT has identified both leading and lagging indicators for each of its major functions. Lagging indicators were defined first, to examine fundamental outcomes. Leading indicators were developed to help predict how fundamental outcomes might change over time. For example, in the safety area, Oregon DOT uses total fatalities as a lagging (outcome) measure. The leading measure is the backlog of safety needs. Addressing these needs should help reduce fatalities, but it may take years to see the change or even evaluate updated data.

Agencies also should be prepared to address the inherent biases or underlying agendas of certain performance management stakeholders, particularly at the highest levels. There may be pressure to publicize or highlight positive measures, and likewise there may be concerns about negative measures, particularly those that highlight issues not under the direct control of the agency.

Track changes over time. This is the key to successful analysis of progress. Agencies should employ a balance of leading indicators (signals of future performance) and lagging indicators (measures of existing or past performance) to inform the resource-allocation process. To better calibrate assumptions about the impact of future funding levels, performance measures should link system inputs, needs, and outputs. Ideally, performance measures should be sensitive and focused enough to show the impacts of allocation decisions on specific policies and programs of allocation. Time-series data also may show diminishing returns on a particular strategy or program, indicating that it has become less effective over time and that a change in strategy is needed. This was the case in Washington, where the Washington State's DOT's (WSDOT) analysis of travel times on HOV and non-HOV lanes showed that the HOV travel time advantage was lessening over time, leading the agency to develop an action plan to address the problem.

3.2 Support Performance Management with a Nimble Strategic Planning Process

Since 1996, Ohio DOT has produced a biennial state-of-the-system report and business plan. Each edition of the plan contains strategic objectives to be achieved within the biennium, longer-term goals, and performance measures. In early editions of the business plan, managers developed strategies for their individual business units without consideration of the department. More recently Ohio has focused on developing a consensus around a small number of strategic initiatives, selected by a core group of senior managers for the entire agency. Each initiative is linked to a handful of specific action items, including assigning responsibilities to specific divisions or individuals.

Strategic planning is the foundation of performance management, but the focus is too often on the product (a plan) rather than on the result (a strategic direction for the agency, with concrete actions). Strategic planning should help the agency focus on a limited set of short-term outcomes that are tied to specific performance measures. The strategic plan should make the agency's focus clear to all staff. As with the measures themselves, the strategic plan that first and foremost identifies the agency's most compelling problems and lays out a path to address them is far more useful than one that is simply "comprehensive," giving equal treatment to all facets and divisions of the agency.

Use strategic planning and performance management to navigate through uncertain times. Financial and regulatory uncertainties are becoming the norm for many DOTs, and this trend does not appear likely to reverse itself any time soon. Strategic planning and performance management not only help an agency to operate more efficiently as resources become increasingly scarce, but they also empower the agency to better anticipate external changes and to be more responsive to them.

Focus on a limited set of high-level outcomes. A nimble strategic planning process is inclusive but not all-encompassing. On the contrary, it should help the agency to focus on outcomes that can be addressed within a short timeframe (typically 1 to 2 years). Being focused means that effective strategic initiatives have explicit start and end dates, and are supported by clear leading (output) and lagging (outcome) measures.

Recognize when excessive planning is getting in the way of decisive action. Although strategic planning is the basis for effective performance

management, there comes a time when an agency must move the focus from planning to measuring and changing behavior. Organizations that spend considerable time developing a series of interrelated business plans are not more likely to use them, as the process to develop them can become burdensome and exhaustive. Those agencies that hone in on a limited set of priority outcomes are more likely to address them quickly and effectively. The Florida DOT has required all business units and districts to develop business plans. However, most have not, and those that have been developed have not often been used. Although business plans can be useful to the extent that they focus the agency, requiring all units of an agency to develop them may not have the intended impact.

The Indiana DOT (INDOT) organizes its performance measures by function—external (reported quarterly); tactical (same measures as the external group but reported by District); and operational (more detailed, organized by INDOT's organizational chart, and reported monthly). The measures are stored in the Management Information Portal (MIP) that provides standard reports for various audiences and access to performance data for INDOT staff.

3.3 Use Performance Management to Improve Agency Transparency

In sharing performance data, it is more important to sell the process than the agency. The goal of performance management is to tackle difficult problems and improve the agency, not to provide public relations material. Agencies must work through resistance to presenting negative results and must recognize that performance measurement will not only highlight improvements, but also may uncover chronic problems. Often, short-term pressing problems will lead staff and managers to resist measuring performance because they do not feel they have the time to address longer range process improvements. Also, improvements in data collection techniques, the frequency of data collection, and the completeness of the dataset, may give the impression that things are getting worse, when in reality they are only being more accurately measured. In other cases, negative performance data may not reflect poorly on the agency itself at all, but rather on an outside factor such as inadequate funding or rapidly increasing demand. As part of focusing the agency, it is important not to avoid these difficult challenges.

Performance management should highlight existing and potential problems. Performance management will never result in a perfect agency. Rather, the measure of success of a performance management program is whether an agency is developing a deeper understanding of the nature of its problems and developing programs to address them. Performance management is not the end of the process, but it is a crucial beginning point. If an agency does not understand the nature of its problems, it is in a poor position to correct them.

In an environment of constrained resources, tradeoffs are inevitable, and the agency that best understands the nature and consequences of these tradeoffs will be most effective going forward. High-quality performance data that link leading and lagging indicators not only help the agency to prioritize its needs, but also highlight the overall unmet financial need. For example, at Pace Suburban Bus Service, officials indicated that although improved analytical capabilities driven by their Intelligent Bus System have made it easier to identify problem areas and the steps necessary to solve them, resource constraints mean that these solutions are not necessarily implemented. However, armed with this knowledge and the data to back it up, the agency can make smarter use of scarce resources and can present a stronger, more convincing, and more credible case for increased funding in the future.

Development of the Gray Notebook was part of a larger effort at the WSDOT in the 1990s to address an accountability crisis and to repair an erosion of trust between the department and the legislature. The WSDOT owes much of its improved public stature to increased accountability and transparency within the project delivery process. The WSDOT made on-time and on-budget project delivery a priority, seeking to avoid surprises by combining quantitative project data and results with detailed, candid narratives. Project delivery performance is reported every quarter on project cost, scope, and schedule. Deadlines are set early in project development, and project teams are required to keep within these parameters or explain why they have deviated. The Gray Notebook identifies projects with schedule, scope, or budget concerns, holding project managers accountable for on-time and on-budget performance of their projects.

In King County, Washington, the county government's "AIMs High" (Annual Indicators & Measures) program integrates Performance Measures of agency effectiveness with Community Indicators that represent overall conditions in the region. The goal of this integration is to demonstrate the complex relationship between the agency's decisions and the overall conditions in the community and the influence that these two realms have upon one another. King County's Performance Measures and Community Indicators span nine different topic areas, including Natural Resources, Health, Transportation, and Governance. Within each topic area, the two categories of measures are displayed alongside one another, but always distinguished, and each includes a discussion of each factor's determinants, and the county's role in influencing it.

Don't just report the numbers. Especially when dealing with measures that indicate negative trends, it is vital that the measures be presented in the appropriate context. Reports should use a narrative description to ensure that key points are communicated. In many cases there may be unmeasured externalities or unusual circumstances at play. For example, Washington State DOT includes substantial narrative with the performance measures presented in their Gray Notebook (see sidebar), to provide clear explanation and analysis of results. Washington State DOT is discussed further in the sidebar case study in this section. Several officials interviewed as part of this research also indicated that improved data collection techniques and more complete data sets actually gave the impression that conditions were worsening, when in fact they were simply being measured more thoroughly. This is a perfect example of the type of anomaly that could be addressed through a thoughtful and thorough narrative explanation.

Remember the big picture. DOTs (and all government agencies) are often hesitant to include measures of factors that are outside of the agency's direct control. Among these are "Societal Outcomes" that measure quality-of-life. Some of these factors might be neither directly caused by nor directly responsible for agency performance but are important because they are the most direct measures of the real circumstances experienced by citizens. Ideally, the agency looks at both its own performance and the circumstances of its community, and relates one to the other to affect real positive outcomes. For example, while air quality is not directly controlled by DOT activities, it is a factor of great importance to residents of urban areas throughout the country, and is undoubtedly *related* to many DOT activities and resource allocation decisions. In many cases the appropriate level for the development of societal level measures might be at a higher level of government (i.e., overall state government instead of inside the DOT). As governmental entities develop broader performance management and measurement initiatives, transportation agencies can link to a broader set of societal goals that the transportation agency is supporting through their investments.

The New Jersey DOT has developed an approach for its Capital Investment Strategy (a performance-based effort to guide capital decisions) that incorporates measures from the New Jersey DOT, New Jersey Transit, and two public toll road operators. This strategy allows major decisions to be made that reflect a coordinated approach to transportation challenges, rather than a more narrow focus on an agency's limited sphere of influence.

CHAPTER 4

Performance Management Must Engage with Employees

This chapter describes insights from practitioners on how to engage the entire agency in the performance management process and promote an agencywide performance culture. The most successful programs are those in which employees at every level—from the CEO to maintenance crews, planners, design teams, or an information technology officer with no direct transportation expertise—have a stake in the agency's performance and the condition of the transportation system and understand the purpose, goals, and procedures of the performance management program.

Many of the successful programs cited in this Guidebook began their journey towards performance management with a strong and visionary leader that saw the need for a program, built the necessary coalitions to implement it, and took a direct role in administering it. Most also were able to develop a performance culture and a commitment among agency employees to consider the performance of their agency as they conduct the daily business of the DOT.

Many of the challenges that have precipitated performance management programs at state DOTs have been high-level challenges, such as a lapse in agency credibility or general mistrust between the DOT and the state legislature. These challenges often do not manifest themselves in the everyday activities of the many employees that perform the agency's work, who are sometimes isolated from big picture decision-making and typically insulated from its impacts due to civil service regulations. Frequently, though, it is the conscientious conduct of the day-to-day business of the DOT that can help improve the efficiency of the overall agency. Though senior management typically set the long-range strategic directions for the agency, translating these directions into small, everyday actions, such as improving the change order approval process or analyzing alternative snow and ice control strategies, can save the DOT significant resources.

There is a wide body of management research that suggests that in facing an organizational crisis, the behavior and dynamics of an organization fundamentally change. For example, the natural tendency of an organization in response to crisis is a shift toward greater centralization of decision-making authority. However, maintaining this type of response can lead to reduced innovation and a feeling among employees that they do not have a real impact on or a stake in the organization's outcomes. Thus, strong leadership is only truly effective in steering an agency if it is complemented with a collaborative approach and a proactive effort to build and maintain trust between agency managers and employees.[1]

As DOTs and other transportation agencies develop performance management programs, it is important that they provide meaningful engagement with agency employees, both by

[1]Mishra, Aneil K. "Organizational Responses to Crisis: The Centrality of Trust." Kramer, Roderick M. and Thomas Tyler (eds.) *Trust in Organizations*. Newbury Park, CA: Sage. 1996. pp. 261–287.

empowering them to improve the functioning of the agency and by holding them accountable for their individual actions and decisions in relation to the DOT. This is more vital than ever, given the financial challenges DOTs currently face that make it challenging for them to retain their best staff.

4.0 Senior Management Must Support the Program

Strong leadership from a DOT's chief executive or senior management is almost always a defining factor in the success of any DOT's performance management initiative. Although performance management cannot be accomplished solely through a simple top-down directive, agency leaders must set the tone and demonstrate that measuring performance and instituting a performance-based decision framework is going to be a priority at the agency. The most effective way to set the tone is to make regular use of performance data and reports. They also must understand and make use of the performance management system to make it clear to agency staff that it is the way the agency wants to do business. This means taking a direct role in the process, rather than delegating. It also means building support among the state's political leaders, so that the legislative process is in sync with the performance-based decision-making process in place at the DOT.

For a variety of reasons, there are cases where an agency CEO is not the champion for performance management. This may occur due to management philosophies, a decentralized agency, or other reasons. Performance management is not necessarily doomed to failure without a CEO champion. Directors of appropriate agency divisions, such as maintenance, planning, or human resources, can still lead performance management initiatives within their own departments. Likewise, in highly decentralized agencies, district managers may have the discretion to use performance management within their jurisdiction, and their successes might prove to be a model for the rest of the agency.

Participate in the process. One important performance management leadership trait is a willingness to participate—directly and often—in performance-related processes such as meetings and preparation of measures results reporting. Numerous cases have highlighted the power of a CEO's very presence in a periodic performance update meeting as a motivational tool that bolsters the credibility of the program and at the same time drives employees to perform at their best. Of course, participation in the process is moot unless the CEO's leadership also includes using performance results to guide decision-making. One of the hallmarks of Baltimore's CitiStat program has been weekly operational meetings that have focused on examining what the data say about agency performance. This approach, though not always on a weekly schedule, has been adopted by the State of Maryland for all of its agencies under the direction of Governor Martin O'Malley, who developed the CitiStat program as the Mayor of Baltimore. At the Indiana DOT, performance reports are reviewed at monthly management meetings. This sends a message that the system is important and helps shift the culture of the agency.

Balance the big picture with the details. Because of the layered and multifaceted nature of most performance management programs, DOTs need to bring a mix of leadership skills to bear in developing the program and executing performance measurement activities. At a minimum, designing a successful program requires a "big picture" vision to set the basic direction, ideally provided by the agency's CEO or another top-level executive. At the same time, a more pragmatic "get it done" focus on results, challenges, and specific measures is needed to turn this vision into a management framework and action plan. This is ideally provided by department heads, who represent the unique needs and attributes of their agency function. Finally, data needs and other technical details should not be an afterthought in the visioning process.

Provide staff and resources to support the performance management program. Developing performance management programs requires staff time and resources to research appropriate measures, develop reports, and educate and inform staff about the effort. Although successful agencies make performance management part of the entire organization, not just a single office, they universally have staff dedicated to helping develop and grow the program. A performance management office can provide support and education to other staff, and help advance the state of the practice, but should not be seen as the only implementer of performance management. As the former head of Ohio DOT's Office of Quality and Organizational Development noted, "My job was to make sure that I did not own quality."

Build support for the program with the state's political leaders. DOT executives should actively work to build support for performance management with politicians, to ensure that the state's transportation agenda is consistent with DOT activities and responsive to the needs that are brought to light through performance measurement. Political support is particularly important in cases where the DOT's credibility in allocating resources and delivery projects may be compromised—in a number of cases, this very challenge was the driving force behind implementing performance management. It also is critical in states where certain transportation funding allocations are codified into state law, effectively taking the decision-making authority away from the DOT and giving it to the legislature.

The Georgia DOT (GDOT) has initiated a performance management process called TRAQS to provide a scorecard in key areas. The GDOT has faced challenges implementing this system because performance management concepts were never communicated throughout the Department; too many measures (over 300) are collected creating a cumbersome system to communicate; and performance measurement efforts were driven too strongly by one group, causing the rest of the agency to lose a sense of ownership for and interest in performance management.

4.1 Hold Staff Accountable for Agency Performance

When employees understand that their job performance is gauged in part by the outcomes of appropriate performance measures, they are much more apt to see the "big picture" in their work, and to find management strategies that influence results. Therefore a crucial component of performance-based management is cultivating an agency philosophy that stresses the idea that "we're all in this together." For example, Missouri DOT requires senior executives to sign a "charter" that commits them to the use of performance measures in their work.

Bring performance measurement into the routine of everyday activities. One key to successful performance management systems is the regular interaction of staff with leadership about the use of performance measures. Most successful programs have regular meetings where performance measure results are presented and discussed. Employees are challenged to explain problems and propose solutions. These should not be exercises but real attempts to improve agency function. Nor should they be antagonistic, but rather conducted in the spirit of cooperation. Just as every agency employee should feel that they have a stake in the agency's overall performance, no manager should rise above responsibility when things go poorly. At the City of Baltimore, a central tenet of the CitiStat program is the biweekly agency meeting cycle, where leaders address short- and long-term trends, and problem areas are identified using performance data. These meetings involve an active two-way dialogue where agency heads present their performance data and respond to questions from the mayor and his assistants, with the assistance of tables, figures, and maps.

Incorporate system performance into employee reviews. One way to reinforce the idea of shared responsibility for the DOT's mission is to mandate that every employee's periodic performance review include measures of not only individual performance, but also transportation system performance as a whole. Staff reviews can take into account a diversity of measures such as bridge and pavement conditions, project implementation, safety improvements, and so on. Raises

At the Ohio DOT, personnel reviews for all senior managers are required to include systemlevel performance measures to evaluate their contribution to system performance. Designed to create incentives for teamwork, specific measures are selected collaboratively by employees and management. The use of systemlevel measures has encouraged departmental managers to consider how they can improve fundamental system performance. For example, the manager of the Planning Division is measured in part on pavement quality. As a result, the planning division has increased funding and training to the districts to help ensure that they are meeting their targets in this area.

and bonuses can be contingent upon that performance. Perhaps the most challenging aspect of this point is holding these standards even to support employees whose functions are not directly related to transportation performance such as information technology or accounting. These employees have a role in transportation system performance by way of their importance in maintaining agency performance and should be held appropriately accountable. Implementing system performance measures into employee reviews should be done carefully, however. Not all aspects of system performance can be easily addressed, and how staff conduct their work is as important as the final results. Using measures in this way may be controversial but can help focus staff on the ultimate goals of the agency that they are working to support. At the Indiana DOT, performance-based incentives account for 7 percent of the annual budget for employee salaries.

Publicize comparative data across districts and functional groups. It is important to make performance data available on demand to all agency employees. One potential benefit of this is the ability of individual departments or districts to see how they are doing, not only in general but in comparison to the rest of the agency. Public availability of measure results may provide extra incentives to improve the way an office or agency functions and increase the accountability of staff. Both the Ohio DOT and the Virginia DOT are now using performance measures to help allocate funding to individual districts or regions. Using information on system conditions and estimated future needs, these efforts help in the effectiveness of resource allocation and draw attention to programs that districts may be using to achieve better results with their allocation. Virginia DOT has begun using statistical analysis of individual agency programs to try to better understand what produces positive "outliers" for system performance.

Be careful not to confuse accountability with punishment. Although performance management should call attention to challenges faced by the DOT and potential shortcomings of existing approaches, the purpose of performance management is not to punish or humiliate staff. Instead, its value is in getting staff to examine the implications of agency decisions on system performance and an attempt to improve performance by using resources as efficiently as possible. Managers and staff will both want to be careful not to jump to conclusions about data and analysis that has not been appropriately tested and validated.

4.2 Empower Staff to Take Ownership of the Program

Performance management programs must do more than just highlight agency problems. They also must provide opportunities for individual staff to take action. It is vital to create an environment where individual employees can have a positive impact on the way the agency operates. To accomplish this, employees should be kept apprised of program development, should receive training as necessary in the implementation of the program, should be provided full and regular access to performance data, and should be frequently encouraged to recommend and enact solutions. An agency's most valuable resource is its personnel, and providing individual staff members with the information, the environment, and the confidence to take on challenges is the best strategy to encourage creative problem solving and foster a culture of shared responsibility.

Vertically integrate data access and responsibilities. The same performance data that allows an agency to gauge its overall progress towards its goals also is useful to individual departments and employees in making short-term decisions. For this reason it is important to provide per-

formance data at many levels of the organization. Providing universal access to performance data goes hand-in-hand with widely distributing data reporting responsibilities to the appropriate parties. Well-defined data ownership is critical to ensuring data integrity and consistency and was a weakness identified by a number of case study agencies.

At the Ohio DOT, all agency staff have direct access to the performance management data system on their computers. They can use standard queries to examine system performance or build their own, but all employees are able to make use of performance data in their daily work.

Keep employees informed. As changes are implemented, performance management leaders must keep employees abreast of changes and ensure proper, timely training. Employees should comprehend broad agency goals, how their role relates to overall agency goals, and how performance management will affect them, as well as possessing a mastery of the technical aspects of the program.

Many agencies, such as the Florida DOT, use agencywide newsletters as a regular conduit for information and updates about an evolving performance management program. At the Florida DOT, the performance management office keeps employees up-to-date on the incremental rollout of the agency's business planning process through a monthly newsletter called *Perspectives on Excellence.*

At Pace, agency leaders took a proactive role in introducing employees to the new performance management technology, training them on it, and helping them to understand how it benefits not only the agency as a whole and its customers but also the individual employees. This went a long way towards placating employees, many of whom were initially suspicious that the program sought to increase worker surveillance and posed an increase in overall worker responsibilities. In fact, the program has helped provide data to counter unfounded complaints about specific drivers.

Encourage creative problem solving. Performance measures work best when they encourage creative problem solving. Techniques to promote creativity among individual employees include rewarding innovation, encouraging targeted risk taking, and holding expositions where employees showcase their cost-saving or performance-enhancing solutions.

Identify needed skill sets to support performance management. Defining measures and setting targets can help a DOT identify the skills its employees need in their daily work. Measures and targets give meaning to the efforts of employees and can help management understand the relationship between specific skills and achieving results on these measures. At the Ohio DOT, staff indicated that performance management had improved their hiring process, allowing them to better identify what they needed from candidates for

The Ohio DOT has taken strides to ensure that the whole organization participates and support the agency's strategic initiatives. The Ohio DOT has used several efforts to maintain this focus on quality, including the following:

- Establishing an Office of Quality and Organizational Development which acts as a central clearinghouse for all of Ohio DOT's attempts at improving efficiency and working with districts and the central office to support efforts at continuous improvement.
- Taking employees' ideas seriously through a statewide initiative led by the governor to collect ideas from state employees. Ideas are reviewed, and feasible ideas are assigned to a staff person or a team to implement.
- Recognizing employees for their independent efforts to improve efficiency through an annual event called Team Up ODOT that allows process improvement teams to showcase their work.

The Missouri DOT (MoDOT) has been examining performance-based bonuses in its project delivery area, among others, under the Performance Plus program. This program rewards MoDOT employees for going above and beyond the call of duty to increase productivity in the department's core business areas. The program began with a pilot project launched in April 2006 to reward construction project office employees for achieving a final construction cost within one percent above the contract award amount (or less) on projects in MoDOT's Statewide Transportation Improvement Program. To date, it has yielded $37 million in cost savings at a cost of $500,000 in employee rewards. The success of the pilot program paved the way for Performance Plus to become a permanent program at MoDOT.

a given position. The Virginia DOT has developed a program to retain individual knowledge in the face of significant retirement and to identify business units that "outperform" others in an attempt to replicate their success in other units.

Include support functions in performance management. All agencies rely on key support functions—information technology, human resources, accounting, and others—to help the agency function. These functions often are not included in agency strategic planning and performance management programs, leading to a lack of coordination between the missions of the agency and these important units. By engaging these functions in the strategic planning process, they can better understand the overall strategic direction of the agency and their role in supporting agency performance. Additionally, all units of the agency should be accountable for overall system performance. To this end, DOT executives should assist the agency's support functions to develop initiatives that better link their actions to fundamental agency outcomes.

4.3 Employee Challenges Are Inevitable

Performance management means changing the way an organization conducts business. As these programs are implemented and individual accountability and responsibility is increased, it is common for employees to resist and sometimes leave the agency. In the wake of performance management program implementation, resulting changes might include department reorganizations as well as staff turnover through attrition, early retirement, or, rarely, layoffs or termination. At one state DOT, 10 of 40 senior manager positions turned over in just 3 years as a performance management program was implemented.

The Georgia DOT has developed a fairly extensive Employee Engagement Survey. GDOT conducts the survey each year. The survey has been used to identify specific behaviors managers need to exhibit in order to engage employees. These behaviors have been integrated into the management review process.

Although some DOTs have the ability to terminate managers who do not perform well, in the world of civil service it is often difficult to remove someone from a position without the strongest evidence of nonperformance or moral lapse. Civil service rules provide a valuable protection for government employees that might otherwise be subject to politically motivated employment decisions and potential corruption. As transportation agencies implement performance management, strategic promotions for employees who engage in and take ownership of the process probably provides the best and most feasible path to ensuring strong staff support for the performance management system. Changing from broad managerial authority to data-driven decision-making can be painful and disruptive when it occurs, but is often necessary for fostering the cultural shifts necessary when an agency fundamentally changes its business practices.

Agencies should work with whatever resources they can to provide (1) tools to reward individuals who champion performance management and (2) incentives for those who do not champion performance management to leave. There is a potential feedback loop whereby employees who support and promote performance management are rewarded and promoted, resulting in an overall strengthening of the agency's performance management culture.

Fundamentally, an agency should first attempt to develop and train staff within the organization. Although organizational change can be a challenging process, efforts to train staff and build support for the program from within can help ensure a longer lasting effort, as described in Chapter 6.

CHAPTER 5

Performance Management Requires a Customer Focus

This chapter highlights ways that DOTs use performance management to guide their efforts to achieve a balance between engineering integrity, fiscal responsibility, and customer satisfaction outcomes.

DOT managers—perhaps naturally as engineers—sometimes lean toward the engineering component of this equation, which can weaken an agency's efforts to satisfy customers or to be fiscally responsible. DOTs are well equipped, for example, to use life-cycle cost principles for choosing the right construction techniques to build roads that last a long time, but their customers' preference for systemwide road surface smoothness may not be met with this model for prioritizing pavement preservation projects. At the same time, customer demands for system performance are growing, often despite flat or declining budgets.

When a DOT charts its course without adequate attention to customer satisfaction and engineering integrity, the passage may become stormy. Ignorance about issues important to customers—from winter storm readiness to project cost management—can foment public discontent that quickly spawns negative press like "DOT Bungles Response to Ice Storm" or "New Highway to Cost 20 Percent More" and draw the scrutiny of reform-minded legislators. Ultimately, a DOT's inadequate regard for customer needs may generate pressure for drastic changes in agency budgets, policies, and procedures. Change can be good, but is there a less painful way to achieve outcomes that benefit DOTs and their customers?

Winning over customers and keeping them satisfied necessitates a blend of technical science and tactical art that is inherent to good performance management. Most DOTs already possess or can easily acquire the technical talent to measure factors that influence customers' perceptions of performance—such as road smoothness, litter pick-up, incident clearance times, or visibility of traffic markings. In these same DOTs, however, the tactical art of how to interpret and respond to performance data in ways that boost customer satisfaction-related factors is often underdeveloped.

Some DOTs are finding ways to marry technical data collecting capabilities with tactically savvy ways to deploy data in decision-making. The customer satisfaction-related benefits they gain translate into fewer headlines like "DOT Bungles Response to Ice Storm" and more success stories like "Legislature Approves Highway Funding Package." Strategies include aligning performance targets and customer expectations; learning how to better balance constraints in decision-making; and building agency credibility via modest, customer-focused "quick fixes."

5.0 Align Performance Targets with Customer Expectations

The menu of performance measures that is practical for most DOTs is modest. Numerous studies have concluded that successful DOTs tend to examine the same general set of performance focus areas using similar metrics. Most DOTs, for example, track safety performance via the absolute number of fatalities or relative fatalities per unit of vehicle miles traveled, or they track bridge conditions via a bridge condition index. Customers' expectations, however, are often fuzzy. In the area of congestion, for example, customers may care generally about a combination of travel speed and trip reliability, but DOTs may lack good information about what customers believe constitutes a satisfactory speed or level of reliability. As a result, even with the right measures in place, DOTs often struggle to set performance targets that match customer expectations. If the agency sets its congestion targets too low, customer satisfaction may fall; but if it sets the targets too high, funds may be spent unnecessarily on achieving less congestion than customers care about. DOTs can address this challenge by making better use of feedback from customers to help set performance targets.

Understand how performance correlates with customer satisfaction by using novel techniques. Some DOTs, including Kansas, Missouri, and Pennsylvania are using "road rally" techniques to get a better picture of their customers' expectations about factors such as pavement roughness, congestion, or centerline striping visibility. In a road rally, groups of randomly selected interviewees are asked to rate their satisfaction with roadway and traffic conditions as they are driven on preselected stretches of highway. Follow-up analysis of road rally derived satisfaction levels can be used to correlate them with a DOT's own metrics for measuring roadway roughness, congestion, or centerline condition, etc. Armed with this information, the DOT can predict how customer satisfaction levels might change as performance changes for a particular metric. The Pennsylvania DOT, for example, has correlated roadway roughness with customer satisfaction.

PennDOT's Customer Focused Ride Quality Research—The PennDOT used road rally style focus groups to identify International Roughness Index (IRI) values that coincide with customer's perceptions of "excellent," "good," "fair," and "poor" ride conditions. It examined how customers' acceptable IRI values vary both across interstates, NHS routes and low volume routes, and between rural and urban areas.

Link traditional performance metrics with customer satisfaction to set meaningful performance targets. State DOTs can use technical measures like the International Roughness Index (IRI) to gauge whether performance is getting better or worse. Ohio DOT, for example, carefully tracks IRI across every DOT district and uses this information in decisions about giving funding to districts whose pavement condition is worsening. Without "road rally" style information, however, a state DOT is in the dark about whether its performance gains or losses are affecting customer satisfaction. In the Kansas DOT, for example, road roughness across the state highway system is at an unprecedented low. Executive staff is wrestling with difficult decisions about whether to allow a decline in pavement condition and invest preservation funds in other needs. At the heart of this conversation is a concern about whether customers in Kansas will notice a slight decline in pavement condition.

Check on customer satisfaction levels with regular surveys. In many DOTs, customer satisfaction surveys are undertaken irregularly and results are poorly linked to the agency's performance management efforts. A well-designed customer survey, however, can help validate information initially developed via a road rally type focus group and translated into technical measure targets. For example, if the road rally points to a cutoff value for centerline nighttime visibility at which customers are satisfied, the DOT can engage in a program for bringing centerline markings up to this standard and can then use the customer survey to validate whether satisfaction levels have in fact improved.

5.1 Learn How to Better Balance Multiple Constraints in Decision-Making

DOTs do not have the luxury of unlimited funding for transportation. Sound engineering principles, however, still dictate fundamentals that must guide the safe design, construction, and operation of every project. Not only must a DOT balance fiscal responsibility with good engineering judgment, but it must find ways to keep customers satisfied. Performance management can help decision-makers generate transportation solutions that harmonize potential tensions among engineering principles, customer expectations, and affordability limits, whether the issue is safety, asset preservation, or congestion.

Rely on a broad perspective when making decisions with multiple constraints. By ensuring that decision-making blends consideration of multiple constraints, some agencies avoid becoming unintentionally focused on a single decision constraint. In the area of winter storm preparedness, for example, a broad perspective might include consideration not only of customer expectations about timely snow and ice removal, but materials cost constraints, and environmental impacts of de-icing chemicals. Multi-criteria thinking helps agencies avoid outcomes that are unnecessarily costly or unresponsive to customers.

Draw on performance management tools to support multi-criteria decision-making. Sometimes performance management tools can be useful in assisting the process of understanding tradeoffs among engineering needs, fiscal constraints, and customer satisfaction. DOTs' computerized pavement and bridge management systems, for example, provide powerful scenario-based forecasting capabilities that allow decision-makers to consider the consequences of changing spending levels or lowering performance targets.

Employ feedback loops between performance results and strategic goals. Every state DOT should engage in a regular feedback loop to check back on the validity of assumptions about the correct balance between constraints by verifying whether customers are satisfied, engineering principles are being met, and budgets are maintained. Missouri DOT's leaders, for example, pay close attention to an array of data as they work to address a backlog of highway preservation needs that cost the agency significant credibility. Not only do they monitor pavement roughness, which has decreased markedly in recent years, but they track the results of customer surveys, road rallies, and focus groups to verify whether new engineering approaches are making a difference.

Ohio DOT's Pavement Condition Performance Measures—For the last decade, Ohio DOT has put a great emphasis on analysis of district-by-district data describing the condition of Ohio's pavements and the rate of change in pavement condition.

It uses this data, in combination with information about funding levels and anticipated preservation projects, to predict pavement condition and to allocate available funding among districts to best meet the agency's statewide goal of uniform quality in pavement. The Ohio DOT reports a dramatic improvement in pavement condition using this strategy between 1997 and 2005.

5.2 Build Agency Credibility via Modest, Customer-Focused "Quick Fixes"

A DOT's credibility with stakeholders is a precious asset. It is arguably as essential to building and maintaining transportation infrastructure as concrete, asphalt, and smart employees, because it enables DOTs to work with the public, the business community, and legislative and governmental bodies to achieve strategic objectives like securing funds to meet critical transportation needs. Credibility is hard won and easily lost. Performance management helps DOTs identify low-cost/high-value solutions that quickly help boost or restore their credibility:

Capitalize on "quick fix" successes. Some DOTs are learning that they should complement long-term, high-cost performance management strategies like asset management programs with

"quick fix," low-cost performance management initiatives; particularly those that help the DOT make strong gains in agency credibility by showing greater responsiveness to customers' needs that easily can go unmet. By being better equipped to capitalize on "quick fixes," an agency's external credibility grows and internal understanding of why performance management is important increases. For Missouri DOT, any new funding source over $5 million has to be approved by a public referendum, not a legislative vote. One of the key focuses of the Missouri Tracker program, therefore, has been to focus the DOT's attention on implementing a series of low-cost quick fixes—in areas such as safety and pavement preservation—that the public can see the benefits of.

Kansas DOT Seeks Right Measure for Road Striping —The Kansas DOT learned in a 2008 customer survey that a higher than expected share of drivers in Kansas are dissatisfied with the visibility of road markings at night and in bad weather. KDOT's performance measures for road markings, however, measured their visibility only during the day in dry conditions. KDOT is now seeking ways to better respond to customers' needs on this topic.

Seek out performance measures that match customers' highest priorities. A DOT can easily slip into the trap of measuring what its staff finds simplest to track regardless of whether measures match customers' concerns. At best, this approach is likely to leave the agency's credibility unchanged; more likely, it will take staff time away from focusing on the right issues. At the Kansas DOT, for example, when the agency began its performance measures program, it tracked miles of "deficient" shoulders on the state highway system because such data are routinely collected. But Kansas customer surveys showed shoulders on most highways in Kansas are generally considered acceptable by the public and use of the measure has lapsed. Agencies should be unafraid of dropping measures that do not prove effective in decision-making. High-priority topics vary from state to state; in one, project delivery might be the highest priority, and in another, it might be roadway condition. Finding the right topics depends on a blend of intuition and feedback from customers.

Use measures that the public can understand. Some performance measures in common use among DOTs do not translate well to a nontechnical audience. Persistent reliance on such measures can hinder efforts to boost credibility. Use of volume-to-capacity ratios to describe congestion, for example, illustrates how a valid engineering approach for quantifying traffic problems means little to nonengineering audiences. In Washington State, the DOT is now using "operating speed" as a more meaningful measure of congestion. Operating speed compares the peak-hour actual average operating speed with the desired operating speed to gauge how inefficiently traffic is moving. Speed is a concept that individual drivers can relate to directly, aiding in communicating performance measure results to the public. Other approaches, such as graphical display of typical traffic patterns to represent volume-to-capacity ratios can be useful as well, though these lack some of the precision of the measure of speed.

CHAPTER 6

Sustain Performance Management by Building Constituencies

Over a period spanning two decades, an increasing number of state DOTs have adopted large-scale performance measurement initiatives. Despite a growing body of evidence that suggests performance management helps DOTs do their jobs better, some agencies' performance programs fail to take root while the programs of others have grown and flourished. This chapter offers suggestions on how to create enduring and successful performance management programs.

Why do some DOTs' performance programs falter? The answers are complex, but the following themes appear to be frequent contributing factors:

- **The CEO dominates performance initiative then departs.** A DOTs' performance management programs are often initiated and championed by the CEO. When the CEO leaves, the DOT's program may flounder without its perceived champion, particularly if the CEO's tenure was too short to overcome entrenched institutional bias against measurement.
- **The performance program gets siloed in the DOT.** A DOT's performance measure program may be pigeon-holed as the responsibility of a particular staff team within the DOT rather than an agencywide tool to help everyone do their jobs better. In this scenario, managers across the DOT do not become engaged in using performance measures beyond periodic reporting of data and the program loses relevance as a decision-making tool. Though staff support from a performance management office can help ensure that regular reporting is possible, these individuals should not "own" performance at the agency.
- **Measurement is driven by the wrong balance between external mandates and internal DOT priorities.** Some DOTs' performance measures are created in response to state legislative mandates. They never transform from routine data collection exercises into fully fledged performance management programs that truly impact decision-making.
- **External audiences are not part of the performance program.** A DOT's performance management program may not reach important external audiences, such as the state legislature or key stakeholder groups like the business community and advocacy groups. When external audiences are not engaged, performance management may be taken less seriously by DOT staff that sees no accountability.
- **Managers resist changes to their decision-making authority.** DOT performance management programs are often resisted strongly by managers in the organization. In many DOTs, there is a persistent culture that enjoys making subjective and/or political decisions. Performance measures are often seen as a threat because they will limit their flexibility.

A DOT's performance management program should be crafted to withstand profound changes such as new leadership or a shift in policy focus that can make it difficult to sustain program momentum. For agencies embarking on a new performance management program or seeking ways to sustain their program, the keys to a performance management success are a strong focus on institutionalizing and engaging all of the managers at a DOT, working with stakeholders, and communicating.

6.0 Senior Management Must Work to Institutionalize Performance Management

Performance management is often spearheaded by a CEO or senior manager who seeks to solve serious agencywide management challenges, such as shrinking a credibility gap with the public, reducing persistent project cost overruns, or reversing deteriorating bridge conditions. As noted in Section 3.1., strong senior management leadership is usually vital to a fledgling performance program's success, but DOTs sometimes find that the senior management leadership can also "brand" a performance management program with its champion's identity. As a result, an incoming leader may be tempted to make his or her administrative mark by charting a course away from performance management. DOTs that have successfully carried performance management forward across administration changes report an ability to institutionalize performance management in several ways:

Missouri DOT's Executive Leadership Pledge—Executive staff at the Missouri DOT (MoDOT) are expected to sign a U.S. Constitution-style value statement that attests to their willingness to participate in performance management at the agency. While the MoDOT has seen some attrition among its senior managers in recent years, possibly because they reacted unfavorably to a new performance culture, executive staff is committed to using performance measures to continually try to improve the agency.

Ensure senior career DOT managers share a leadership stake in performance management. A strong leader may be tempted to retain tight control over the agency's performance measurement program. In the longer term, however, sharing performance management leadership responsibilities among key career DOT staff, particularly those with key roles such as the chief engineer, is vital to engendering widespread staff support for the program and continuity beyond a single leader. (See sidebar for Missouri DOT's approach.) This approach blends high-level leadership from a CEO with the genuine support from one or more career status managers who act as performance measurement champions. These are well-respected individuals with a long tenure at the DOT who understand the business of the agency and can help keep performance measurement focused despite inevitable shifts in top-level leadership.

Transform performance management from a leadership style to a practical tool. Predictable performance reporting schedules, frequent and regular discussion of results, standard formats for sharing data, and clear identification of staff responsibilities are all techniques that help transform performance measures from a persuasive but transitory management style to a permanent tool. Some state DOTs are finding that by using these techniques, performance management is becoming accepted as another valuable utility—like Computer-Aided Design (CAD) for engineers or Geographic Information Systems (GIS) for planners—for managing the agency. In this type of environment, managers can build a case for continuing to use performance measures regardless of a change in leadership because performance management is an essential tool. At the Ohio DOT, for example, the agency's pavement performance measures have continued to guide infrastructure preservation investment decisions over a change in leadership.

Remain "policy neutral." In any state government, the impact of politics on decision-making is unavoidable. Particularly when new administrations take charge, agencies may experience fundamental changes to their established practices: priorities change, high-level officials leave and are replaced, and philosophies about the role and responsibility of the agency shift. In order for performance management to withstand these transitions and political upheavals, it is crucial to maintain a policy-neutral process. This means that the performance-based decision-making process should be flexible enough to accommodate fundamental changes in policy without favoring one over another. Examples of policy shifts include reprioritizing preservation versus capacity expansion; shifting the funding balance between highways and transit; moving towards more or less centralized control over decision-making; or significant across-the-board increases or reductions in agency funding levels. An example of success in maintaining policy neutrality comes from Pennsylvania, where a results-driven approach to strategic planning has been in place since the early 1980s, surviving five different governors and three switches in the governing political party.

6.1 Ensure Many DOT Managers and Employees Are Involved in Performance Management

DOTs often rely on a small performance measurement work unit to perform day-to-day performance management functions and to act as a point-of-focus for the agency's overall activities. Such an office, however, may run the risk of creating a perception among other DOT staff that performance is not their responsibility. Most successful performance management programs build on bold leadership by engaging the next tier of leaders at the DOT to act as ambassadors and champions to the agency's entire staff. Without this kind of engagement, a performance program is unlikely to outlast its leader.

Find ways to use performance measures in lower tiers of the agency. Ideally, every manager and their staff in a DOT—not just the agency's CEO—should be charged with finding ways to use performance results in decision-making. This helps institutionalize performance measures across a broad range of functions from human resources to maintenance, and their use by a wide variety of managers to support decision-making on a regular basis helps build the credibility of performance management as a tool. Not every decision need necessarily roll up to the most senior levels of the agency. At the Washington State DOT, for example, maintenance engineers are using data on maintenance performance parameters such as striping condition to help predict budgetary needs and manage maintenance workloads, while planners are using congestion data to select and prioritize urban projects.

Work with labor unions to foster support for performance management. Unions have a potentially powerful role in maintaining a culture of performance at a DOT because of their longevity and influence over rank-and-file agency employees. The Quality Service through Partnership program at the Ohio DOT is a collaboration between labor and management that was driven by the concern of increased outsourcing of DOT responsibilities. It is now included in the collective bargaining agreement and has helped performance measures survive multiple administrations.

Ensure that staff members are trained in performance management. Performance management typically represents a fundamental change in how agencies conduct their day-to-day business. It also requires familiarity with data and analysis tools that may be unfamiliar to many DOT staff. As an agency implements a program, it is often useful to provide thorough training to all staff. When the Ohio DOT implemented its Total Quality Management (TQM) program, every member of the DOT staff received training. This helped reinforce for staff that this was how the DOT wanted to do business and provided them with the tools to implement TQM and performance management in their day-to-day activities.

The Indiana DOT's (INDOT) performance management program is on its third administration, without major changes. The INDOT has worked to document everything (measures, how they are calculated, how they can be used) so that it is easy for new administrations to see the value. When a new administration begins, performance measurement programs have been framed as a resource for the new management—e.g., here is all of this great information that you can use to help identify and solve problems.

Kansas DOT's Performance Hierarchy for Engaging Managers—To engage its managers more effectively, the Kansas DOT is implementing a hierarchy of staff responsibilities for performance measures. Executive staff at the Division Director-level are charged with being "champions" for particular performance focus areas. They have the responsibility to ensure that a strategic direction is set to improve performance. Key senior managers have the responsibility under the Division Directors to lead day-to-day implementation of measurement activities. And multidisciplinary teams are used to provide support in each focus area.

6.2 Use Performance Management to Build Bridges with State Legislators

Many state DOTs have developed performance management or measurement efforts in response to legislative mandates although a few have taken on performance management of their own initiative. However a program is established, DOTs usually find the state legislature to be an important audience for their performance results. Involvement by the state legislature in a DOT's performance management program can, however, be a double-edged sword. Some DOTs have

Florida DOT—Florida sustains its performance management program for areas like maintenance by codifying the requirements into state law. DOT officials have found this to be a positive, not a negative, because it makes clear where the state's priorities lie, including preservation, maintenance, and promotion of the state's Strategic Intermodal System.

The Florida DOT is monitored externally by the Florida Transportation Commission (FTC). The FTC serves as an external oversight board that examines performance data and makes policy recommendations. Commissioners are nominated by the governor and confirmed by the state senate.

struggled to meet unwieldy performance mandates imposed by their state legislatures. Other DOTs, meanwhile, have found that an in-house performance management program can be an important tool for improving their relationship with the state legislature. In particular, some DOTs are finding success in convincing their legislatures to rely on performance data as they make funding decisions that affect transportation. Keys to working successfully with legislators on performance management are described in the following paragraphs.

Work with legislatures to develop flexible parameters for performance measurement. Because of growing interest in performance management as a tool to improve agency results, many agencies have had parameters for performance imposed on them by legislatures. Often, these requirements are prescriptive—detailing specific measures, targets, and reporting requirements that may be inconsistent with the needs of DOT management and may tie the agency's hands in making improvements to the system. Some agencies, such as the DOTs in Maryland and Louisiana, have overcome this problem through overlapping sets of performance measures—one to satisfy external requirements and one for internal management purposes. While this approach works, it increases the complexity of a DOT's performance measurement framework, requires duplication of effort, and can create confusion as to which is the right plan. DOTs should work with legislatures to integrate external and internal performance management systems to limit the additional burden on agency employees to collect and report data. As DOTs invest in the data and analysis tools that are the foundation for a successful performance management system, they develop new and better measures, improved methodologies to establish targets, and other improvements. Initiating an effort before mandates are imposed can increase the likelihood of having a flexible set of regulations. Further, the reporting of performance over time can help build trust between the executive and legislative branches and lead to greater flexibility for the DOT.

Have a vision for communicating performance management information. State DOTs differ greatly regarding their methods and frequency of performance reporting, but agencies that have built effective relationships with their state legislatures tend to pay close attention to how they communicate performance information. From the Virginia DOT's publicly accessible web "dashboards" that are updated on a frequent basis to Washington State DOT's quarterly "performance journalism" reports, states are finding ways to translate complex performance issues to nontechnical audiences. As a consequence, state legislators have begun to expect performance information and are using it in their deliberations.

Engagement with state legislature may increase longevity of performance management program. If a state legislature is regularly engaged in performance management reporting and uses this information to make decisions, both the legislature and the DOT can benefit. The DOT finds a new way to communicate needs, and the state legislature achieves greater accountability. In these circumstances, the long-term prospects for continued use of performance management may increase.

6.3 Make Performance Management Efforts Visible to the Public

The best DOT performance management programs usually have both internal and external audiences. In these programs, performance results are discussed internally at management meetings, but they are also presented publicly in regular reports. The external audiences for these

results can include business groups, legislators, the public, and advocacy groups. High external visibility helps hold DOT managers accountable and creates anticipation for results among key stakeholder groups.

Publish performance results regularly in print and on the web. To ensure the program will be sustained through leadership transitions, make performance data meaningful and regularly available to external customers who will come to depend on it and expect it. Primarily, this means regularly publishing data on the web and in print. Providing transparency to the public can help create demand for data-driven decision-making and make the public more sophisticated consumers of performance data

Use a hierarchical approach for selecting high visibility measures. A hierarchical approach for organizing measures helps DOTs reach internal and external audiences effectively. At the top of the hierarchy are a handful of strategic performance measures on which senior management focuses its attention and that are of interest to customers. These measures are supported by a number of mid-level tactical measures, and below them is an array of lower-level operational measures. When reporting of a top-tier measure raises concerns, investigating lower-level measures may identify contributing causes.

Hold audiences accountable for the impact of their decisions. Where resource allocation decisions are made in the legislature, performance measures can be used to hold politicians accountable and show the impact of those decisions. Information readily available for public consumption can help keep the focus on decisions being made by governments that are not supported by the data and analysis presented by the DOT.

The Washington State DOT publishes performance information tailored to the consumer and publishes reports at specific, recurring times, such as during the annual budgeting process. As a result, legislators have begun to expect the data.

The Virginia DOT publishes performance data on the web as part of a dashboard that provides quick access to key performance statistics and the ability for anyone to drill down into specific performance areas. The existence and use of the online dashboard by many parties has helped ensure its longevity.

CHAPTER 7

Implementation

This chapter describes lessons learned regarding the implementation of performance management programs. It combines relevant insights from previous chapters and organizes them around an implementation model that consists of four basic steps—Initiate, Design, Execute, and Apply. While this model provides a general approach for structuring implementation efforts, the specific details for any given agency need to be tailored during the Design step.

In practice, few agencies are likely to use a simple linear approach to developing a performance management program. Many agencies already report measures or have pieces of a program in place. Regardless of where an agency finds itself within each of these steps, the questions described in the four steps will be useful for agencies to help determine methods to strengthen their existing program.

7.0 Initiate

The first step, Initiate, involves setting the direction for the performance management program. It requires answering three basic questions:

- Why implement the program?
- Who will be involved in it?
- What is its scope?

7.0.1 Why Implement the Program?

Clearly defining the need for performance management is important for focusing implementation activities and can help create by-in for the initiative. The agencies interviewed as part of this research project described several catalysts for their performance management efforts. The examples ranged from a very broad leadership initiative aimed at instilling a performance culture in an agency (Ohio DOT) to a very narrow initiative focused on addressing a specific project delivery challenge (Virginia DOT). Other examples of "why" included the following:

- A desire to communicate achievement of strategic goals in terms of "tangible results" (Missouri DOT);
- The need to improve an agency's accountability (Washington State DOT); and
- A goal of providing more efficient and effective transit service (PACE).

Regardless of the nature of the specific issues driving a performance management initiative, defining them and communicating them is critical in the implementation process. The fundamental question that needs to be answered is, "what do you hope to achieve with the performance management program?"

7.0.2 Who Will Be Involved in It?

Strong leadership from the chief executive is almost always a defining factor in the success of a performance management program. However, significant progress can be made and substantial benefits can be realized even before upper management becomes fully engaged. Performance management programs can begin within any organizational unit and be successful if key staff in that unit are supportive. Once established and applied within an individual unit, performance data has a tendency to filter up through an agency because of a strong desire by managers for more and better information on which to base their decisions.

Initially, a clear understanding of who is involved in the process, regardless of their level of responsibility, is more important than ensuring that upper management is supportive. In defining roles and responsibilities, agencies should, at a minimum, consider the following:

- **The Champion of the Program**—Who will be responsible for coordinating the effort and for ensuring its overall success?
- **The Audience for the Performance Results (internal and external)**—Who will use the information and what specifically will they use if for?
- **Data and Measure Owners**—Who manages the data that will be used in the program and who will be responsible for reviewing each measure before it is published?

7.0.3 What Is Its Scope?

As described in the previous sections, there is no optimal size or shape for a performance management program. Successful programs are highly tailored to the implementing agency—its wants, its needs, its culture, etc. Regardless of the breadth or depth of a program, agencies should clearly define its scope during the Initiate phase. Issues to consider include the following:

- What is the final product and what is the frequency of reporting—e.g., a web-based dashboard with real-time data (Virginia DOT); a comprehensive performance report published quarterly (Washington State DOT); a series of annual reports designed to support the programming process (Florida DOT), etc.
- What functions/program areas/modes will be measured—e.g., highway congestion, safety, preservation, maintenance, operations, project delivery, etc.
- What portions of the network will be measured and at what level of granularity—e.g., will all functional classes be included, will results be reported statewide or by district, etc.

7.1 Design

The second step, Design, consists of developing the details of the program. This step includes developing specific measures and designing mechanisms for reporting results.

7.1.1 Selecting Measures for Agency Strategic Priorities

Performance measures are the building blocks of any performance management program. Therefore the selection of specific measures can make or break a new initiative. A number of previous research reports have covered the selection of measures in detail. Examples include:

- *NCHRP Report 446: A Guidebook for Performance-Based Transportation Planning,* Transportation Research Board of the National Academies, Washington, D.C., 2000.
- *Strategic Performance Measures for State DOTs – A Handbook for CEOs and Executives,* American Association of State Highway and Transportation Officials, Washington, D.C., 2003.

- *NCHRP Report 551: Performance Measures and Targets for Transportation Asset Management,* Transportation Research Board of the National Academies, Washington, D.C., 2006.

Following are some highlights from these and other publications on measure selection. Agencies are encouraged to refer to these reports for more detailed guidance.

7.1.1.1 Criteria for Selecting Measures

A number of criteria have been developed for evaluating potential measures. The criteria can be highly tailored to an agency's specific performance needs, and in practice, the development of specific criteria is often seen as its own step in the implementation process. However, based on the results from previous research and insights from the agencies that participated in this study, performance measures at a minimum should meet the following three criteria:

- **Strategic Alignment—**The measures are consistent with the policies and priorities identified in the Initiate step.
- **Useful for Decision Support—**The measures enable decision-makers to identify problems and assess the implications of DOT action.
- **Feasible to Report —**The measures can be calculated with existing data; or if new data is required, these data can be collected and managed in a cost-effective manner.

Most agencies have performance data in one form or another. A practical approach to developing measures is to review existing measures and data resources, assess the measures in terms of the above criteria, and then fill in the gaps relying heavily on existing data sets.

7.1.1.2 Documenting Measures

Documenting the details of the selected measures enables consumers of the results to fully understand the sources and uses of the information being provided. It also captures the details required to compile data and calculate the measure in subsequent reporting periods. Table 7.1 presents a template for documenting performance measures and provides an example of one of the measures developed by the Oregon DOT as part of its Highway Performance Management System.[2]

7.1.2 Design Reports

Effective performance reports enable stakeholders to access and understand results. In designing these reports, agencies should consider what information to provide, how best to present it, and the mechanics of generating and accessing it.

The content and format of performance reports vary widely based on an agency's specific needs as determined during the Initiate step. However, effective reports typically contain the following information:

- Measures organized by goal or strategic objective;
- The current value of each measure in relation to a specified target;
- Trend information;
- Future projections of performance (if appropriate); and
- Background material and/or a narrative so that the audience can better understand the results.

The two basic options for the reporting mechanisms are (1) standard reports or brochures or (2) interactive access to results via a web portal or management system. In evaluating these two options, agencies should consider the context in which the results will be used. For example, if the main objective is to provide an annual snapshot of system performance as back ground infor-

[2]Oregon DOT, *Highway Performance Management System User Guide;* 2006.

Table 7.1. Template for documenting performance measures.

Measure	State Highway System Crash Rate
Definition	Number of total crashes and fatalities per 100 million VMT and 1,000 population
Owner	Traffic Engineering Services Unit
Use	• Tracking crashes by severity and type on the state system allows the Oregon DOT to better gauge the success of engineering strategies geared toward specific types of crashes (e.g., runoff the road crashes). • The measure is a lagging indicator of safety performance. • The measure is reported annually.
Derivation	1. Identify the number of crashes by severity (fatalities, injuries, property damage) on state highways. 2. Identify the number of vehicle miles traveled on state highways and the number of people in the state. 3. Divide the number of crashes by vehicle miles traveled in millions.
Data Sources	• **Number of Crashes—**Statewide crash database. • **Number of Fatalities—**Fatality Analysis Reporting System (FARS). • **Vehicle Miles Traveled—**Oregon mileage report. • **Population—**To be determined.
Aggregation	By region and functional class (functional class aggregation will use VMT base only, not population).

mation for the planning process, a standard report may be appropriate. If, on the other hand, the objectives include enabling external stakeholders to track the real-time progress of construction projects, a web-based system might be more appropriate.

Figures 7.1 and 7.2 present two reporting examples. Figure 7.1 shows the Virginia DOT's online dashboard. It provides a snapshot of current performance; indicates the degree to which current performance varies from target values using a green, yellow, and red scale; and enables users to drill down for further details. For example, users can click on the Projects gauge and view detailed cost and scheduled information for individual construction projects.

Figure 7.2 illustrates a performance scorecard used by the Minnesota DOT. The scorecard represents a static snapshot of current performance in terms of whether the performance in each area is good, satisfactory, or poor. In addition, smaller arrows provide trend information. For example, the up arrow next to "Bridges in Poor Condition" indicates that this measure has improved since the previous reporting cycle.

7.2 Execute

The next step in the process, Execute, involves performing the mechanics of the performance management program. This step includes collecting and/or compiling data, calculating the measures, and generating and distributing reports. These activities represent a sustained effort that must be performed on a continuous basis throughout the life of the performance management program.

The long-term commitment (and costs) associated with formally adopting and reporting performance measures should be considered in the Design step of the implementation process.

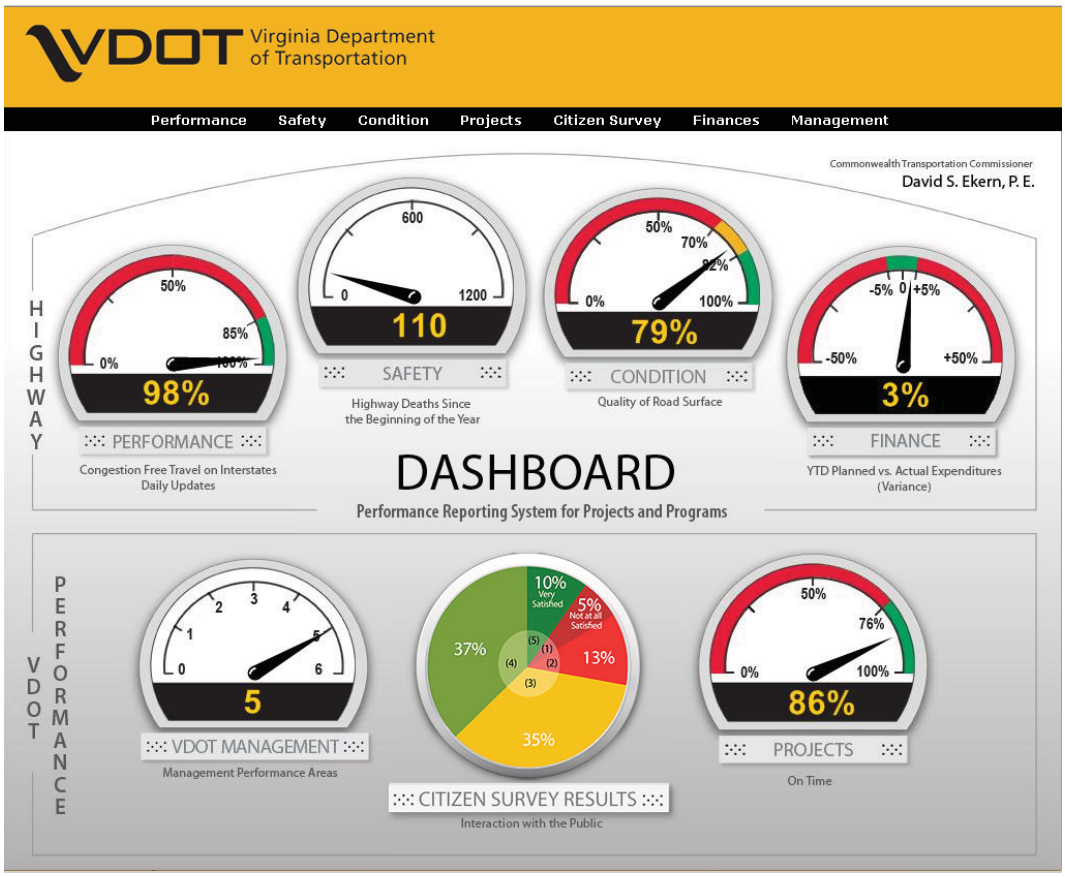

Figure 7.1. Virginia DOT dashboard.

Each potential measure should be evaluated in terms of its benefits relative to the costs of calculating it. For this reason, performance programs often rely heavily on existing data sets. In these cases, the actual collection and management of the underlying source data does not represent a new initiative—rather these activities occur as part of the agency's existing operating procedures. However, the supporting data often reside in a number of systems and databases throughout an agency and are managed by different organizational units. Therefore the amount of effort required to compile even existing data into an integrated performance report should not be underestimated.

All successful performance management programs have a champion or designated staff responsible for sustaining the program. The time commitment associated with these responsibilities significantly will vary based on the breadth and depth of the overall effort.

A common strategy for decreasing the time and effort required to execute a performance program is to automate as much of the process as possible. In most cases, performance measure values are derived by performing a series of calculations on data that reside somewhere in an agency. The process of pulling data from various sources and performing calculations lends itself well to automation. Other aspects of the program that can be automated include the workflow associated with reviewing and approving results and the generation of standard reports. For example, the Maryland DOT has implemented a Performance Assessment and Collection Tool (PACT) that automates some of the day-to-day efforts associated with collecting and reporting performance. The tool enables an agency to identify, document, manage, and report on its goals, objectives, and performance measures.

Figure 7.2. Minnesota DOT performance scorecard.

7.3 Apply and Evaluate

The final step in the implementation model, Apply, involves using the performance results to make better decisions. Similar to the Execute step, the Apply step represents a sustained long-term commitment. The main difference between these two steps is that *using* performance results requires agencies to address organizational, institutional, and cultural issues that go well beyond

the logistical challenges of *calculating* them. In fact many agencies that have made significant investments in collecting performance data have not yet made it to the Apply step. Implementing this step represents the major challenge in moving from performance *measurement* to performance *management.* For this reason, the insights from practitioners presented in Chapters 3 through 6 focused largely on this area.

Implementing performance management at an organization is necessarily a challenge. Managers and employees are often used to a way of conducting business that, for a variety of reasons, they tend to hold onto. At the same time, increasing challenges in project delivery, intractable problems with congestion and safety, and a renewed focus on achieving efficient use of public funds have provided increased focus on any failures.

Performance management takes significant time and effort to develop, especially if it is to last. This Guidebook has provided some insights into how other transportation agencies have successfully begun and sustained the performance management process, including the following:

- Begin by focusing on a clear and present challenge faced by the agency and use performance measures to help describe the problem and provide evidence for the most appropriate solution;
- Bring managers and employees along with this program, building their capability to use and manage with data, while also focusing on ways that they can do better;
- Expand the program over time and into the day-to-day processes and culture of the agency, such that there is an expectation that quality data will be used to support major decisions and agency staff will take ownership of their work;
- Train agency managers and employees to focus on the needs of agency customers and to balance standard engineering and programmatic considerations against these needs so that the agency appears credible and capable to the public and legislative bodies;
- Sustain these efforts over time by ensuring that the program is not connected to a single individual or office within the agency; and
- Ensure broad distribution of performance data to legislators, stakeholders, and the public, building constituencies for the continued use of performance management at the agency.

As a DOT applies performance management to its day-to-day processes, it is vital that it go through an evaluation of the program. This evaluation should take into account the design of the program and its implementation and provide a feedback loop so that adjustments can be made to performance measures and procedures.

Abbreviations and acronyms used without definitions in TRB publications:

AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	Air Transport Association
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation