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Adapting a Culture for Performance Management at the Nevada Department of Transportation

March 2018

Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712

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16. Abstract

State transportation agencies (STAs) nationwide have grown accustomed to using performance management to demonstrate transparency and accountability to the public, state general assemblies, and national stakeholders. The Nevada Department of Transportation (NDOT) has identified cultural acceptance of performance management as a systemic weakness in the agency that could be more effective by improving the relevance of performance measures to NDOT business practices, expanding the use of performance measures beyond reporting, and better using performance data to drive decisions. This report summarizes the results of a study to assess the NDOT culture as it relates to performance measurement (PM), to outline success factors that other STAs have implemented to improve cultural acceptance of PM, and to recommend steps that can be taken to affect agency culture (e.g., acceptance, management practices, decision making) at all levels within the business units. The study used existing literature, interviews with NDOT executives and managers, and discussions with other State DOT officials to identify success factors for implementing a performance management culture. The success factors include communicating with stakeholders, engaging staff at all levels within the agency, and assigning accountability for performance results. These topics were presented to NDOT managers in conjunction with an FHWA-sponsored TPM workshop. The workshop concluded with NDOT agency managers, along with MPO stakeholders, establishing priorities that would enable NDOT to improve the cultural acceptance of performance management. The action items were assembled into recommendations that can guide the steps taken by the Performance Analysis Division to improve NDOT's use of performance management. Initial priorities have been recommended for conducting a formal business planning process for the NDOT divisions and regions and modifying the employee evaluation process within the agency to include strategic and tactical performance measures. Implementing these changes reinforces a new way to do business within the agency using performance management transparently to maintain the public's trust and ensure alignment with the agency vision.

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ADAPTING A CULTURE FOR PERFORMANCE MANAGEMENT AT THE NEVADA DEPARTMENT OF TRANSPORTATION

Final Report

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LIST OF ABBREVIATIONS AND ACRONYMS

Acronym	Definition
AASHTO	American Association of State Highway and Transportation Officials
AB	Assembly Bill
ADA	Americans with Disabilities Act
BBS	Behavior Based Safety
CAMPO	Carson City Metropolitan Planning Organization
CMM	Capability Maturity Model
DOT	Department of Transportation
FAST	Fixing America's Surface Transportation Act
FAHP	Federal-Aid Highway Program
FHWA	Federal Highway Administration
FSP	Freeway Service Patrol
HOV	High Occupancy Vehicle
IMDB	Internal Management Dashboard
IRI	International Roughness Index
LRTP	Long-Range Transportation Plans
MAP-21	Moving Ahead for Progress in the 21st Century Act
MPO	Metropolitan Planning Organization
NCHRP	National Cooperative Highway Research Program
NCDOT	North Carolina Department of Transportation
NDOT	Nevada Department of Transportation
NHPP	National Highway Performance Program
NHS	National Highway System
NPRM	Notice of Proposed Rule Making
PAD	Performance Analysis Division
PennDOT	Pennsylvania Department of Transportation
PEG	Planning Executive Group
PM	Performance Measurement
PSAMS	Project Scheduling and Management System
RPO	Rural Planning Organization
RTCSNV	Regional Transportation Commission of Southern Nevada
S&O	Stewardship and Oversight
STA	State Transportation Agency
STIP	Statewide Transportation Improvement Plan
STP	Statewide Transportation Program
TAMP	Transportation Asset Management Plan
TB	Transportation Board
TIM	Traffic Incident Management
TPM	Transportation Performance Management
TRID	Transport Research International Documentation
TNDOT	Tennessee Department of Transportation
TxDOT	Texas Department of Transportation
UDOT	Utah Department of Transportation
VMT	Vehicle Miles of Travel
WVDOT	West Virginia Department of Transportation
WSDOT	Washington State Department of Transportation

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- Mr. Carlos Braceras – Utah DOT.
- Ms. Amber Mortenson – Utah DOT.
- Ms. Alma Mujkanovic – Georgia DOT.
- Mr. Craig Newell – Michigan DOT.
- Mr. Patrick Norman – North Carolina DOT.
- Ms. Delaine Linville – Tennessee DOT.
- Mr. Avery Poor – Tennessee DOT.

DISCLAIMER

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CHAPTER 1: INTRODUCTION

Background

Historically, an increasing number of state transportation agencies (STAs) have grown accustomed to using performance management to demonstrate transparency and accountability to the public, state general assemblies, and national stakeholders such as the Federal Highway Administration (FHWA). Currently, STAs are required to implement a performance management program by 23 USC 119, National Highway Performance Program (NHPP); 23 USC 150, National Goals and Performance Management Measures; and 23 CFR 490, National Performance Management Measures. While most STAs have developed a performance management structure within their organization, internal staff may not fully adopt the organizational changes necessary to support this structure. The Nevada Department of Transportation (NDOT) has recognized that performance management is more powerful when specific measures are focused on making decisions rather than just reporting results.

Since 2008, NDOT has had a performance management program in place that monitors and reports progress towards performance targets in a variety of areas. To adapt to changing requirements, the agency continues to refine the performance management process, adopt additional performance metrics, and set targets in compliance with Federal regulations. This research effort was conducted to assess the NDOT culture as it relates to performance measurement (PM), to outline success factors that other STAs have implemented to improve cultural acceptance of PM, and to recommend steps that can be taken to affect agency culture (e.g., acceptance, management practices, decision making) at all levels within the business units.

The final report is organized in chapters that describe findings compiled as the project tasks were completed. The chapters include a literature summary, findings from NDOT staff interviews, findings of key success factors in other States, a summary of a workshop conducted with the NDOT management team, recommendations, and an implementation plan. As well as introducing the study, this chapter summarizes the context for performance measurement at NDOT.

Performance Analysis Division

Performance management responsibilities are led by the Performance Analysis Division (PAD) within NDOT. As shown in figure 1, Mr. Peter Aiyuk, the Division Manager, and three staff engineers form the organizational structure for the PAD. Each staff member is assigned certain performance management reports as a primary responsibility along with other non-performance management duties. . The PAD reports to the Assistant Director for Planning, Ms. Sondra Rosenberg, who reports to the agency Director, Mr. Rudy Malfabon. Other peer divisions under the Assistant Director for Planning include: Aviation, Freight Planning, Program Development, Public Transit, Rail, Research, Roadway Systems, Traffic Safety Engineering, and Traffic Information.

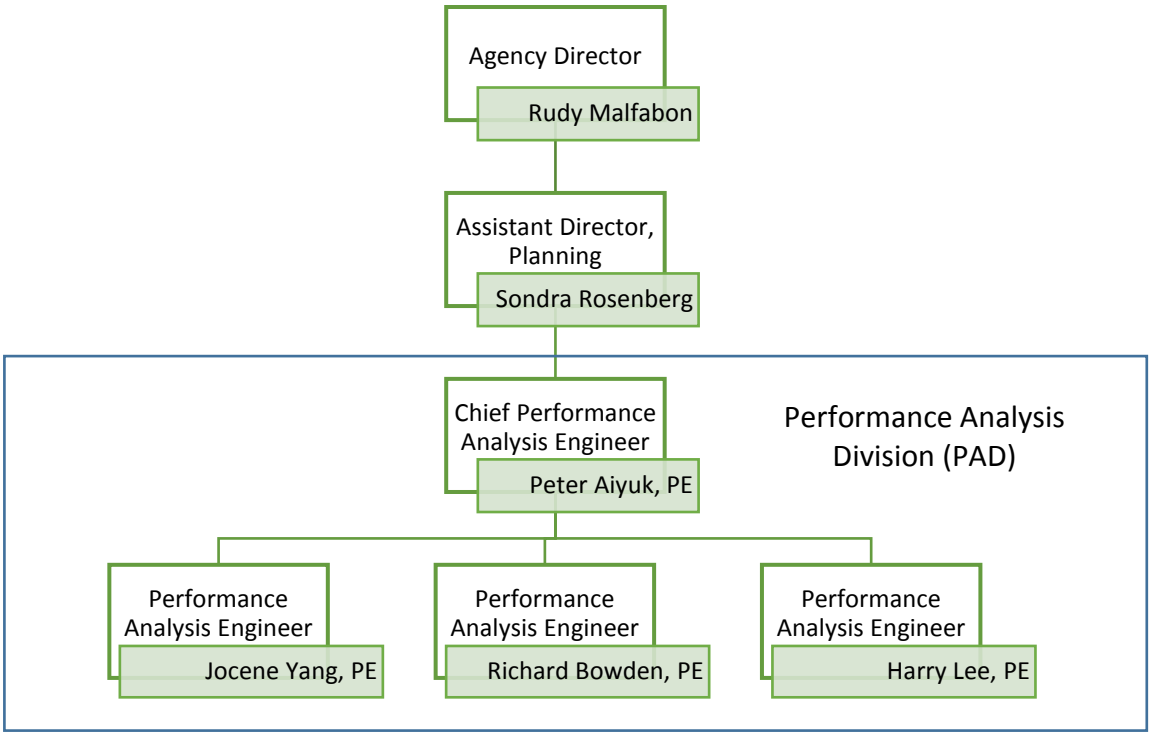


Figure 1. NDOT's PAD organizational structure.

According to the NDOT website (NDOT 2016), PAD's primary responsibilities are as follows:

- Direct the Department's financial planning efforts and conduct special studies regarding transportation funding, including cost allocation studies and distance-based road user fees.
- Provide engineering support for innovative planning and program development activities.
- Conduct special investigations of engineering or operational problems, and analyze, evaluate, and recommend measures for improvement.
- Coordinate the Department's *Performance* Management Program, including the Assembly Bill (AB) 595 reporting requirements.
- Report on NDOT's highway preservation program, including the condition of state-maintained highways and bridges.
- Conduct and coordinate value-analysis studies.
- Report fuel-use statistics to the FHWA for use in federal highway apportionment formulas and general statistical reports.
- Conduct or coordinate cost-benefit studies for the Department.

The PAD produces other reports for the agency in addition to reporting the annual performance management information. A biennial *State Highway Preservation Report* summarizes the work performed and anticipated to preserve the state-maintained roadway network and bridge infrastructure assets (NDOT 2017). The annual *Facts and Figures Report* is also produced by

the Division, suggesting a strong tie with the NDOT Communications Office. The Division staff also coordinate project benefit-cost analysis reports and participate in value engineering teams as projects are evaluated to increase the overall value to deliver projects.

The Division has a consistent workload in delivering reports and other project functions for the agency in addition to delivering *Performance Management Reports*. Delivery of the departments performance measures report to the legislature must be made annually by December 31. As a preliminary step, the Transportation Board reviews and comments on the final draft report during its December meeting.

Performance Measurement at NDOT

NDOT maintains five sets of performance measures spanning many agency business processes. Reporting on these varied business processes requires that many NDOT division managers partner with the PAD and act as champions for the PMs relating to their organizational unit. NDOT has also formed the Planning Executive Group PM (PEG-PM), a partnership with Nevada Metropolitan Planning Organizations (MPOs), to determine how best to implement and report MAP-21/FAST Act performance measures to the FHWA.

Many of the measures maintained within the five sets are similar. For example, a measure for Maintaining Bridges is represented in both the Budget PMs and the Stewardship and Oversight (S&O) PMs. However, the Budget metric for maintaining bridges is the number of bridges considered structurally deficient, while the S&O metric for maintaining bridges is the percentage of deficient bridge deck area. One of the long-term goals of the Division is to streamline these performance measures to simplify the reporting process while still satisfying the reporting requirements. Having common measures and metrics will aid in goal setting and minimizing confusion among the agency staff about NDOT's strategic direction. The five performance measure sets are listed as follows:

- National performance measures.
- NDOT/MPO PEG PM.
- FHWA S&O performance measures.
- Department measures as required by AB 595 (AB595).
- NDOT budget measures reported as the Department makes budget requests.

National Performance Measures

With the passage of highway legislation commonly known as the *Moving Ahead for Progress in the 21st Century (MAP-21) Act* in July 2012, and the subsequent legislation known as the *Fixing America's Surface Transportation (FAST) Act* in December 2015, there is an increased emphasis on performance-based management of the nation's highway system. This approach promotes the development and use of objective, performance-based data for the Federal-Aid Highway Program (FAHP) in the seven national goal areas listed below:

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

- Infrastructure Condition – to maintain the highway infrastructure asset system (pavements and bridges) in a state of good repair.
- Congestion Reduction – to achieve a significant reduction in congestion on the National Highway System (NHS).
- System Reliability – to improve the efficiency of the surface transportation system.
- Freight Movement and Economic Vitality – to improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- Environmental Sustainability – to enhance the performance of the transportation system while protecting and enhancing the natural environment.
- Reduced Project Delivery Delays – to reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

While MAP-21 and FAST Act legislation establish the requirements for the FAHP, the rulemaking process provides transportation agencies with the FHWA's interpretation of the legislation. Final rules have been published that implement a common set of measures that will lead to improved consistency at the national level, enabling the FHWA to better track and forecast the impact of FAHP spending on the nation's transportation system. At the State level, the legislation is expected to result in better investment decisions that consider risk, place a priority on preserving the existing system, and improve agency accountability and transparency.

NDOT has analyzed the published rules and has developed a transportation asset management plan (TAMP) in anticipation of the measures for pavement and bridge performance. While the measures will be consistent across the nation, state agencies are responsible for setting many of their own targets or goals for performance.

NDOT/MPO PEG

In 2014, the Nevada MPOs, the FHWA's Nevada Division Office, and NDOT formed a PEG PM to collaborate on PMs. A goal of the collaboration is to use common measures, commonly available data sources, and PM targets during the implementation of the MAP-21 and FAST Acts and the associated federal requirements. This forum provided an opportunity for the stakeholders to provide input and establish expectations as the federal requirements are implemented.

Stewardship and Oversight Agreement Measures

The Nevada Stewardship and Oversight Agreement documents the roles and responsibilities of the FHWA's Nevada Division Office and NDOT with respect to project approvals and related responsibilities, and documents the methods of oversight which will be used to efficiently and effectively deliver the FAHP (FHWA and NDOT 2015). The program areas within the agreement may be consistent across the nation, but the responsibilities, measures, and targets adopted within each state are independently developed with the cooperation of FHWA Division offices and then reviewed at the regional level. NDOT and the FHWA Nevada Division have currently adopted forty-four measures to track and report during the oversight cycle. The

measures are largely grouped by organizational unit within NDOT, including System Preservation, Safety, Planning, Operations, Local Program Administration, and Construction.

Departmental Performance Measures (AB595)

NDOT reports fifteen measures each year to the legislature as required by Nevada Legislative Assembly Bill 595, which passed in 2007. The agency was directed to establish measures relevant to NDOT's operational requirements. NDOT selected measures that align with the Department's mission, vision, values, and goals. Measures reported to the legislature include but are not limited to: reducing work place accidents, providing employee training, reducing traffic congestion, reducing fatal crashes, and maintaining state bridges. As NDOT considers building more common measures and streamlining the reporting process, stakeholders are expected to be involved in the process. Under AB595, NDOT has the authority to change performance measures/targets, but must have Board approval to change any measures.

Budget Performance Measures

As a component of performance-based budgeting, NDOT is reporting performance measures associated with each major allotment code included in the agency budget. The budget performance measures are associated with NDOT's unique organizational structure and highway classification system, which may prevent them from aligning easily with national measures. Budget measures are listed by category to include specially funded projects, construction of roadways and facilities, maintenance of roadway and facilities, project delivery, fleet, multimodal operations, emergency management, and general administration.

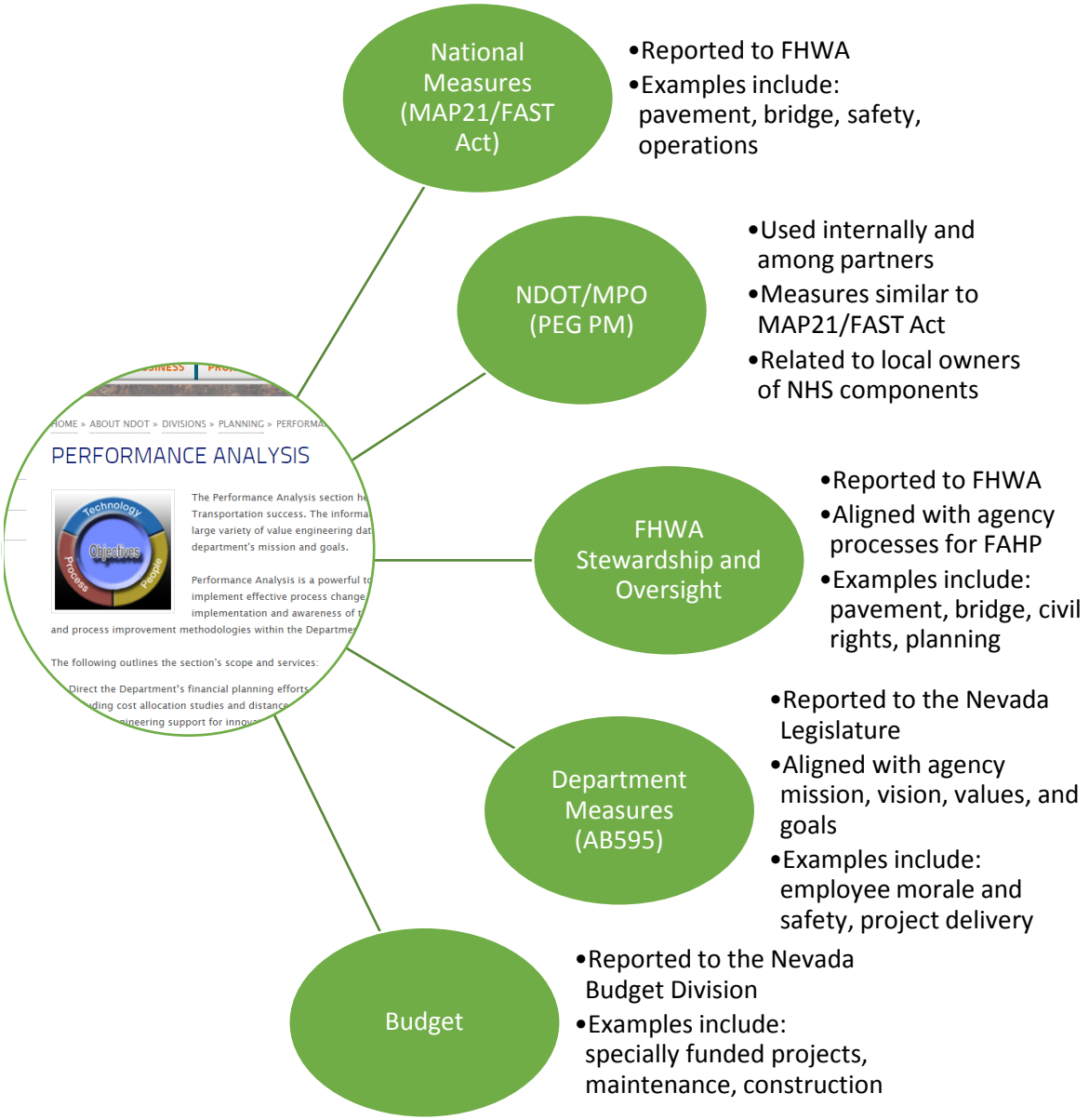


Figure 2. Five sets of NDOT performance measures.

Process

The PAD shares responsibility for reporting performance with PM champions. Champions are usually division heads having responsibility for collecting and reporting data and performance. The PAD schedules annual meetings with the PM champions and the Director to go over performance and share expectations for the coming reporting cycle and to maintain the momentum of the program. Semiannual meetings are considered to be advantageous, but difficult to schedule.

All performance measures do not share the same collection schedule and may be updated on differing frequencies. For some performance measures, the annual update cycles vary based on different calendars, including the agency fiscal year (July-June), federal fiscal year (October-September), or calendar year (January-December). The PAD often reminds data owners and champions of delivery dates for the metrics, and experiences varying degrees of cooperation in

retrieving data from the data owners. The PAD works with the data champions to ensure that the data, analysis of the current year data, strategy for the next cycle, and the target are worked into the proper reporting format for publication.

Key Areas

Past efforts to categorize NDOT's performance measures have organized these metrics into five key areas: employees, project delivery, assets, partners, and safety. Figure 3 represents the overlapping nature of the five key areas, which can also be closely related to the agency goals. This alignment helps to communicate the agency mission, vision, values, and goals using the selected measures and along with achieving the metrics. These categories also resonate with employees, partners, legislators, and the public by illustrating areas of accountability.

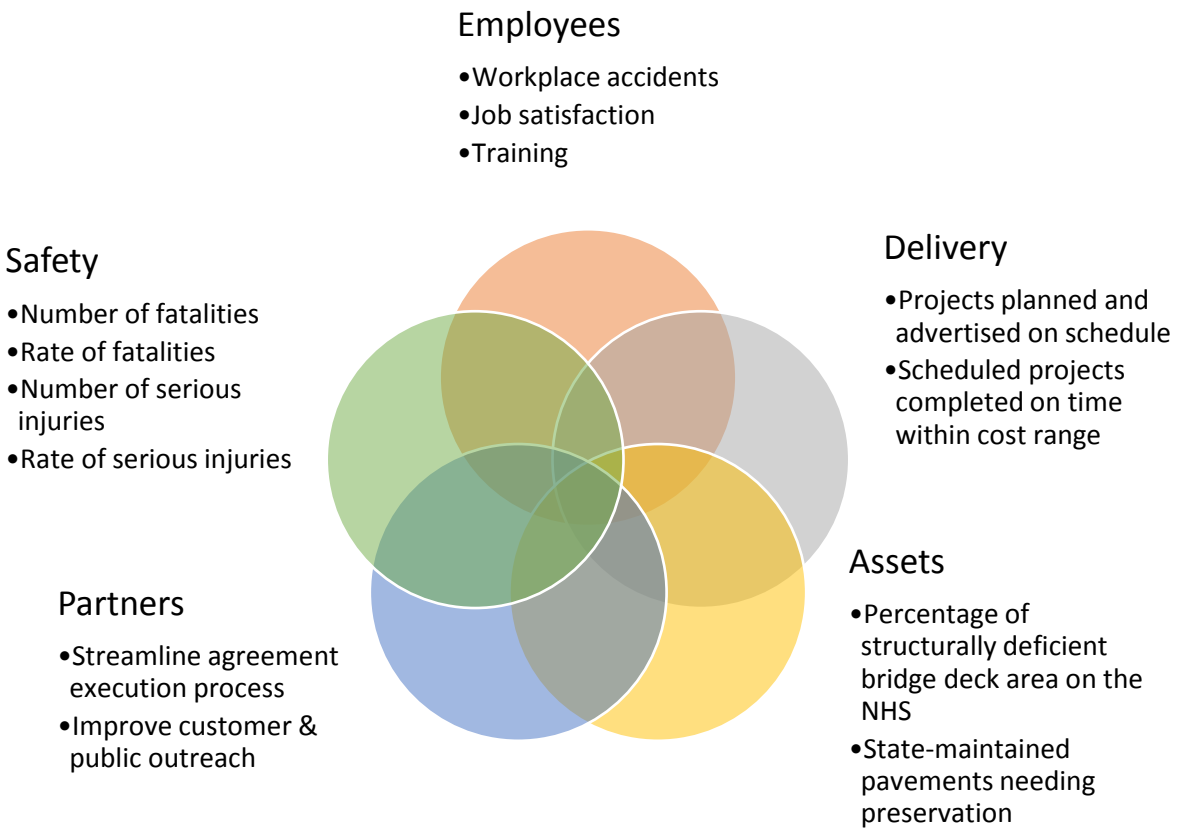


Figure 3. Key NDOT performance measurement areas.

Key Performance Management Customers

The key customers of the PAD PM efforts are the executives who, ultimately, are responsible for managing the agency in the most efficient, accountable, and transparent way. NDOT executive management depends on the PAD to deliver the various reports, with the full cooperation of the measure champions and data owners. The Communications office also uses the information in an easily-assimilated format to present the agency's story to the press and the public.

The legislature and FHWA frequently use the reports that are produced and have established the current requirements for reporting progress. The FHWA Division Office holds the federal

funding obligational authority, and often passes along PM products to the United States Congress for use in setting appropriations for transportation funding. The Nevada legislature holds the state funding authority and also has the ability to increase or decrease NDOT's funding. While funding authorities often require performance tracking with funding allocations, performance data is not always required when requesting additional funding.

CHAPTER 2: PERFORMANCE MEASURES AND AGENCY CULTURE LITERATURE REVIEW

Background

In analyzing NDOT's PM program, a literature review was conducted to identify best management practices from documents published by other state DOTs, the American Association of State Highway and Transportation Officials (AASHTO), the FHWA, the National Cooperative Highway Research Program (NCHRP), and other relevant sources. The results of the literature review follow.

Findings

To identify the existing literature available, a search was completed through the Transport Research International Documentation (TRID) database. From the results of the search, relevant documents were selected that highlight the important factors within agencies that improve the likelihood of successfully using PMs in making management decisions. These documents included an AASHTO *Handbook for CEOs and Executives*, the FHWA Transportation Performance Management website, and the NCHRP *Guide to Cross-Asset Resource Allocation and the Impact on Transportation System Performance*. In addition, state DOT case studies have been included to provide context for findings identified in the current practice interviews. These states were selected because they have been identified by the research team as having relevant similarities to NDOT. Highlights from these and other relevant sources are provided.

Strategic Performance Measures for State Departments of Transportation: A Handbook for CEOS and Executives (AASHTO 2003)

This reference emphasizes that strategic management and performance measures must be fully integrated to aid agencies with their mission to ensure the safety and cost efficiency of the transportation system. Strategic management, as defined in this document, incorporates multiple planning activities to identify agency goals and objectives that are then used to develop strategies that achieve them. Performance measures used in daily business elements can often be too detailed and specific to be representative of the overall agency performance. Linking these business element measures into strategic performance measurement allows a connection between strategic goals and the daily processes necessary to meet them.

The reference suggests that for strategic performance measures to link strategic management and performance measurement, it is necessary to translate the organization's vision into performance metrics that can be measured accurately, are reliable, and drive the right decisions. The four key parameters suggested in this document to establish and benefit from a strategic performance measurement program are the existence of basic principles, the establishment of criteria for measure selection, the selection of individual measures, and the creation of an implementation framework, each of which are individually addressed.

Basic Principles

Strategic performance measurement's basic principles include functions, benefits, the need for customer satisfaction, leadership and perseverance, and the challenges to implementing performance measurement. There are four functions for strategic performance measurement:

- Internal Communication Function: provides communication of strategic priorities to employees.
- Business Management Function: provides an organizing theme and focal point for management processes.
- Decision-Support Function: provides a cost-effective decision-making tool.
- External communication: allows stakeholders and customers to be aware of the agency's priorities, goals, and objectives and how the agency plans to achieve them. For example, Washington State DOT implemented the Gray Book to strengthen external support for agency programs by demonstrating its focus on critical stakeholder concerns.

The main benefit of strategic performance measurement is the capability to set goals and objectives while monitoring progress toward goals in a timely manner. However, the following benefits justify the need for strategic performance measurement:

- Shapes organizational culture. This allows DOTs to involve the staff in performance improvement and increases employee accountability for specific objectives. For example, New Mexico DOT employees improved performance in 16 key areas through 86 performance measures. Employee support in developing, reviewing, and enhancing these measures contributed to the success of the agency in meeting strategic goals.
- Maintains focus on strategic goals. This focus assures the strategic plan is followed in order to protect successful programs and improve the operation of both assets and personnel. For example, Louisiana Department of Transportation and Development's (DOTD's) senior management utilize performance measures to convert goals and objectives into delivery priorities and to delegate responsibility for these priorities to organizational units.
- Strengthens trust with stakeholders and customers through communication of agency priorities and accountability. For example, Pennsylvania DOT circulates easy to read publications and individual measure report cards for stakeholders and customers on performance trends for critical issues.
- Identifies and addresses customer needs in order to respond to them. For example, Florida DOT, through customer outreach, determined that quality and visibility of roadway signage and pavement markings are a safety concern for elderly drivers, which led to aggressive improvements in driving conditions for older motorists.

Customer satisfaction is a critical aspect of strategic performance measurement. Agencies must focus on using customer opinions to shape strategic management direction. Strengths and weaknesses pointed out by the customers should drive the agency's goals and directions. Customer expectations may be used to shape or create a specific performance measure. Agencies have obtained valuable feedback from customer interviews and surveys that have led to changes in existing performance measures, as detailed below.

- Responding to customer satisfaction surveys, the Louisiana DOTD agency leadership made improving agency credibility with their customers a strategic priority. This led to both developing a management goal that focuses on institutional change and creating objectives under several goal areas that focus on customer satisfaction.

- Snow and ice removal in the Minnesota DOT is a major maintenance responsibility to achieve customer satisfaction. Market research on customer expectations led to developing and improving snow removal performance.
- Florida DOT recognized that customer perception about the quality and cleanliness of rest stops has a significant impact on the agency's overall image. Simple surveying machines were installed at each location asking users to register their experiences with the facilities. Customers unsatisfied with the facilities were asked to fill out a card to identify the cause of their concerns. The results are promptly reviewed to provide managers with an early alert if the quality of services drops at any individual rest area.
- Pennsylvania DOT surveys customers about each strategic focus area to aid in developing a complete picture of agency performance (internal measures of performance are also utilized). For example, in the Maintenance First focus area, customers are asked to give an A through F grade for timeliness of repairs, line painting, snow removal, litter pick-up, and road signs. Customer grades augment more traditional internal measures for the Maintenance First focus area, such as the International Roughness Index (IRI).

Leadership and continual perseverance by the strategic performance measures manager is required to build a culture for performance management. The culture is strengthened when employees know the measures are endorsed by agency leaders and are used to make operational decisions. For example, Pennsylvania DOT's strategic planning has evolved over several years from an internal focus to a stakeholder-driven focus to a customer-driven focus. According to the reference, agency managers should be closely involved with the performance management program and expect results to occur as the agency culture adapts to perfomrance management.

Performance management will typically encounter multiple internal and external challenges. Common challenges include:

- Externally imposed requirements that may be inconsistent with the DOT's needs and objectives. Overlapped performance measures to satisfy external requirements and internal management purposes allowed Maryland DOT and Louisiana DOTD to overcome this issue. If multiple sets of measure are maintained, the complexity of the performance measurement framework increases, inefficient duplication of effort is required, and confusion is created as to which is the right measure.
- Budget inflexibility may occur, making it difficult to align agency budgets with priorities and performance measures. Florida DOT's strategic links between agency strategies and budgeted program areas were initially awkward, but through time and effort, the strategic priorities and budgetary structure evolved and have become closely aligned.
- Exposure to greater legal and political risks may occur due to publicly reporting not only where the agency is succeeding, but where it requires improvement.
- Employee commitment to the strategic priorities and performance management system may weaken without continual emphasis.
- Limited resources and staff constraints may reduce agency capacity for performance management.
- Non-integrated data collection systems obstruct efficient performance management reporting and may introduce error due to manual entry.

- Agency size and disparate office locations require strategic coordination to reach all staff.

Criteria for Measure Selection

Agencies set strategic priorities in several ways. A common manner is to develop strategic plans based on the agency's vision, mission, goals, and objectives, where the latter drive the development of measures. Another option is to use strategic components of the agency's Long-Range Transportation Plans (LRTP) to develop initial performance measures. Whichever way the agency defines its performance measures, it is important to first identify where the agency is, where it wants to go, and how it plans to get there.

Although similar services are delivered, each transportation agency has a unique strategic plan. Several key criteria recommended in the reference should be considered for performance measure selection, as noted below.

- Keep a manageable number of performance measures. Select areas of critical importance and adjust the number over time. For example, Maryland and New Mexico DOTs have approximately 80 measures reviewed on a regular basis. Florida and Pennsylvania DOTs use 15 to 20 measures to review strategic performance.
- Use input and output measures to identify the committed resources and the product of these resources, as well as outcome measures to assess the results of an activity compared to its intended purpose. Outcome measures are considered the most useful for strategic performance measurement, however, DOTs can use a mix of different types of measures to meet goals and objectives.
- Ensure a balanced set of measures that reflect processes and products. Avoid focusing on a specific area for all of the performance measures.
- Utilize leading and lagging performance measures to identify and address problems in a timely manner. Lagging measures provide information after the occurrence, but leading measures enable an organization to make timely decisions that can influence future performance.
- Allow flexibility in the use of measures. Strategic plans may change, and a measure may no longer be helpful.
- Utilize existing data sources. It is wrong to assume that new data sources are required for all performance measures. In many situations, existing data can provide the information needed for performance management.
- Balance data availability and analytic rigor. An extensive collection of new data and complex analytic measures can be overwhelming to an agency. Be sure the level of detail in data collection matches the level of detail needed to drive decisions.
- Avoid using only easily measurable activities. Avoid staying away from quantifying and interpreting data for an important issue because of its difficulty. For instance, congestion is a critical issue, but accepted parameters to measure it are only just emerging. Maryland DOT monitors the percentage of projects advertised each year that are intended to reduce recurring congestion. Washington State DOT measures the annual vehicle hours of delay statewide at maximum throughput speeds. Massachusetts DOT measures the number of incidents that have caused delays or closures. Minnesota DOT measures

the Twin Cities' Freeway Congestion by a percentage of metro-area freeway miles below 45 mph in AM or PM peak, and Colorado DOT measures the total travel time delay in minutes.

Selection of Individual Measures

Typically, state agencies focus on a reduced number of strategic issues that can be influenced by external or internal factors. Externally-driven issues are often measured through performance outcomes and may be complex to measure due to limited or no control over the external influences. On the other hand, internally-driven issues are subject to less or no external influences, hence a better control of the agency over these measures.

Externally-Driven Strategic Issues

Data may not be typically collected for externally-driven issues; however, the issues remain a concern to stakeholders. Below is a list of the typical externally-driven issues that state DOTs may be concerned with that are included in the reference:

- Mobility and Congestion: Input and output measures help to highlight the need for action and demonstrate agency commitment. Agencies typically measure congestion, traffic flow improvement, capacity expansion, and non-single occupant vehicle mode.
- Safety: Due to its importance, this is the only strategic issue for which considerable amounts of data are collected, and multiple performance measures should address this issue. Selected measures typically include fatalities, injury, and/or crash rate (vehicle, bicycle, and pedestrian), crash cause, and safety measures (e.g., seatbelt use).
- Community Quality of Life: Typical measures related to quality of life include neighborhood conservation, urban reconstruction, and new bicycle lane miles.
- Environment and Sustainability: Measures fall into one of two major categories:
  - Natural Environment: Inputs and outputs (e.g., area of reforestation planted compared to required area) are easier to measure than environmental outcomes (e.g., air quality and water quality).
  - Process Improvements: These include measurement of environmental process elements such as completion times for documents or percentage of environmental commitments met.
- Economic development: Economic development measures may relate to the percentage of programmed economic development projects advertised within the fiscal year or the number of new businesses in an area.

Internally-Driven Strategic Issues

Measurement of internally-driven strategic measures is typically not challenging if data is readily available from the various DOTs' business functions. The main challenge is to identify the best data from the many available options to best represent agency priorities. The types of internally-driven issues suggested in the reference are listed below.

- System Preservation and Maintenance: Health of highways and bridges are critical for any DOT. Three categories of common measures are:

  - Pavement Smoothness Measures (e.g., percent of miles of pavement that have good and poor ride quality).
  - Bridge Condition Measures (e.g., percent of structurally deficient bridges).
  - Service Life Activity (e.g., remaining service life).
- Project Delivery: Relevant measures include both project development and construction. These measures are especially attractive to DOTs. They provide an efficiency and reliability message to stakeholders, employees, and the public. Commonly used measurement categories are:
  - Cost Measures: Construction costs and total costs to develop and complete projects (e.g., original contract cost versus final contract cost).
  - Construction Timeframe Measures: Number of projects completed and the time to develop and construct them (e.g., original construction contract time versus actual time).
- Operations: Performance data is limited, and customer satisfaction is highly influenced by operations issues. Hence, operations performance measurements are a strategic issue (e.g., customer satisfaction at rest areas, maintenance expenditures per centerline mile).
- Human Resources: Data for this category is readily available in most agencies. The priority is to determine measures that help drive human resource decisions. Typical measures fall within the categories listed below.
  - Sick Leave/ Workers Compensation Measures.
  - Hiring Measures.
  - Employee Training Measures.
  - Employee Safety Measures.
  - Employee Satisfaction Measures.
- Budget Management: Performance measures to assess budget and financial management.

Implementation Framework

An organized framework allows management to track significant quantities of performance measures, keep track and interpret results, and act based on the results.
There are three basic elements that comprise a strategic framework.

1. Hierarchy of Measures: At the top of the hierarchy, the senior management focuses on certain strategic performance measures, which are supported by other mid-level tactical measures. Below both of these are the lower-level operational measures. This makes identifying causes easier when a top-level measure is alarming.
2. Annual Business and Action Plans: Business plans link the agency's top-level strategic goals with everyday employee activities, allowing managers and staff to focus on daily activities and meet strategic organizational goals. Under a business plan, multiple action plans are developed to provide detailed information for work units within a division. Business and action plans should be able to identify what is

to be accomplished, who is accountable, what actions will be achieved, and what budgetary and time constraints exist.

3. Executive Level Performance Measures Office: This work unit is responsible for supporting the development and implementation of strategic performance measures for the entire organization.

It is important to communicate results internally and externally. Graphics allow for improved understanding compared with tabulated data. Color dashboards, trend lines, and reports enhance agency communication and stakeholder understanding.

The parameters described above should be supported in management's commitment to institutionalizing strategic performance management. Successful agencies will:

- Encourage employee buy-in and ownership. Everyone should be involved and have the desire to meet performance goals as an agency.
- Establish regular review of results. Avoid allowing performance reviews to be a secondary or tertiary task by establishing a schedule and staff accountability.
- Ensure flexibility in the roster of measures. Changing measures should never be an obstruction since circumstances vary with time, and strategic performance measurement is an iterative process.

Guide to Cross-Asset Resource Allocation and Impact on Transportation System Performance (NCHRP, 2015)

Transportation agencies have used performance measures as a management tool for decades. However, performance-based planning, where strategies are evaluated and selected to meet performance goals across multimodal agency assets, is not as common. In a performance-based planning organization, agencies must determine the required investments to be programmed to meet their priorities and achieve goals. This reference presents background for performance-management based resource allocation, but is not directly related to cultural factors affecting a DOT. However, the background information is relevant to the findings contained in the current practices summary and is included here to support later discussion.

The reference indicates that it is necessary to first understand budget allocation practices used by agencies in order to implement a cross-asset resource allocation framework. In developing the document, crucial institutional aspects (such as the historical context for resource allocation, key decision making elements, approach differences, barriers, and constraints) were explored to determine the validity of implementing such a framework. The review of these aspects determined that state agency practices for resource allocation vary from one agency to the other, based on the practices and factors listed below.

- Legacy Driven: Resource allocation is determined in accordance with the existing program structure and based on the historical funding amount assigned.
- Fix it First: The allocation process is driven by asset managers who determine preservation needs. The remaining budget is then allocated to desired projects.

- Soft Optimization: The allocation process begins as a legacy driven or fix it first approach and adjusts allocations to align with the agency's priorities.
- Performance-Based: Performance measures play a major role in resource allocation.
- Weak Strategic Direction: Goals and priorities between DOTs, MPOs, regional planning organizations, or local governments are not aligned, making the selection of priorities that should drive cross-asset allocation difficult.
- Tools and Data: Available tools and data have significantly improved in the recent past. Nonetheless, some localized areas of performance do not have available information.
- Institutional Constraints: Internal barriers exist to prevent a change in resource allocation approaches.
- Organizational Considerations: Highly decentralized agencies that allow districts to decide their resource allocation make the agency's ability to make changes to the allocation process difficult.
- Public/Stakeholder Issues: Stakeholders are typically use to working within the existing process and changing it may be seen as a threat.
- Political Resistance: New allocation processes must take into account the political influence in decision making.

These aspects are of great importance and must be analyzed in depth in order to properly implement cross-asset resource allocation.

Agency goals clearly set through objectives are essential for performance-based planning, and national goals must be accommodated in the framework. Effective goals are meaningful, measurable (quantitatively or qualitatively), and trackable in order to achieve widespread recognition by stakeholders, personnel, and the public. Performance measures should track progress towards goals with respect to resource allocation. Performance targets are typically set based on allocation-constrained, forecasted performance or expert opinion and are adjusted through time.

Prediction modeling allows forecasting of performance for specific programs and is of great importance to the framework. Utilizing available data and calibrating to reflect current conditions in order to generate the prediction models will refine the performance outcomes. Project impacts can then be analyzed prior to implementation and normalized to a common metric for direct comparison between programs (e.g., bridge management, pavement management, mobility management, safety management), allowing a performance-based budget allocation selection. This comparison can only be carried out if a repeatable normalizing method exists in which every project has a specific weight, scale, and score through which it will be prioritized and optimized to select the most cost-effective projects with respect to performance.

Factors necessary to characterize a project are as follows:

- Weight: Utilize a value matrix to evaluate priorities based on project benefits and importance to the decision maker.
- Scale: Convert project benefits into a common unit of comparison.

- Score: Show project benefits in terms of importance to the decision maker.
- Prioritize: Utilize benefit-cost ratio to rank eligible projects.
- Optimize: Select cost-effective projects with respect to both budget constraints and performance.

Finally, it is important to carry out a trade-off analysis that informs stakeholders and decision makers the anticipated benefits or ramifications by allocating funds in a certain way for a final decision to be made and achievable performance measures to be set.

TPM Noteworthy Practice Series

The FHWA has published several case studies documenting state DOT practices in transportation performance management (TPM). Several of the documents included in the series are described here.

North Carolina: Refining a Performance Management System (FHWA, 2013)

The North Carolina DOT (NCDOT) has been using performance management for many years; however, in 2007 they recognized the need to realign their performance management system due to the fact that they were only delivering between 25 to 50 percent of their Transportation Performance Program, even though 90 percent of their employees were rated as "outstanding." This disconnect led to a poor perception of the department by outside stakeholders. To rebuild stakeholder confidence, NCDOT began to configure its performance management system to reinforce a new approach that focused on improving four areas:

- Developing a uniform organizational mission with clear goals.
- Reforming their project planning and prioritization process.
- Reinventing their performance accountability systems and culture.
- Improving the way they recruit, develop, and retain their staff.

These areas are integrated into the performance management system, which consists of seven main components:

1. Mission and goals set the direction and strategy for the agency and its projects.
2. The work program prioritizes projects and services using both programmatic and project-level information. It accounts for the department's entire budget, ensuring that every dollar NCDOT spends is accounted for, and is easily understood by the public, helping to communicate NCDOT's work effectively.
3. Executive measures are designed to track NCDOT's progress toward its goals. These measures consist of critical performance targets, indicators, and outcomes identified by the department to gauge annual success. Results are monitored routinely by managers and presented to the Transportation Board quarterly so that decisions can be made to enable success and improve outcomes.
4. Dashboards and scorecards are used to report on performance. These show the specific actions and progress towards NCDOT reaching its measures and goals. NCDOT's Internal Management Dashboard (IMDB), is a web-based set of critical business

performance metrics that enable DOT managers to see real-time performance information in an interactive menu.

5. Unit work plans include the activities accomplished and drive the higher-level measures in the work program. These work plans are created at the start of each State fiscal year, forecasting the operational performance measures and activities produced during the year.
6. Employee performance is tied to the overall performance of the organization. Employees are now held accountable for the successes or failures of the organization in meeting established performance metrics.
7. Continuous improvement shows that performance management is an ongoing process and reminds everyone that the results must be utilized to refine the NCDOT mission and goals.

The restructuring of NCDOT's performance management system has increased the delivery of programmed transportation projects to 75 percent as of 2012. With future adjustments, they are targeting to achieve 95 percent of delivery of their programmed transportation projects.

Pennsylvania: Evaluating Performance Measures (FHWA, 2013.)

Although the Pennsylvania DOT (PennDOT) has used performance measures for many years, the agency decided in 2011 to evaluate whether the measures they had in place were serving their intended purpose. During the review, they found duplicate measures, extremely complicated measures, unintended consequences, and data quality issues. After the evaluation, the recommendation was made to develop PennDOT's Performance Measure Evaluation Guide to ensure performance measures were driving appropriate changes. Once core measures were established, any additions or changes to the measure in the future will need to follow the measure evaluation flow map. This process includes the questions listed below to define performance goals clearly and to guide optimized measure development.

- Who is using the measure?
- What exactly is being measured?
- Why is this particular measure needed?
- Whose performance is being measured?
- Is the performance goal defined?
- Does a similar measure already exist?
- Is the existing measure meeting the needs and intent or should it be modified?

If a measure is needed and a similar measure doesn't exist, the assessment continues by asking the next set of questions:

- Does the measure affect continuous improvement?
- Is the data for the measure updated as frequently as needed? Should it be updated monthly, quarterly, or yearly?
- Is the measure easy to quantify?

- Is the measure easy to understand?
- Is it clear who owns the measure?
- Does the measure provide a means of comparison?
- Have unintended consequences been investigated?
- Can the unintended consequences be successfully mitigated?

The answers to these questions determine if a measure needs further refinement or, in the case of a new measure, if it passes to a pilot process. The availability of the guide, along with partnering with MPOs and Rural Planning Organizations (RPOs), have helped ensure that performance considerations are taken into account when choosing projects and setting goals across the state. PennDOT aims to continue evaluating and improving its measures to arrive at a more focused set of measures, for themselves and their partners.

West Virginia: Planning for Performance Management (FHWA, 2013)

When the West Virginia DOT (WVDOT) decided to implement performance management, the agency recognized it needed to review the existing conditions, set a manageable number of performance measures, create a dashboard with an implementation plan, design budget approaches to address the agency's funding limitations, and review and revise the process where appropriate.

Performance Measures

To help keep the implementation manageable, the WVDOT elected to limit the number of measures that were established. One of the biggest advantages to this decision was the agency's ability to distinguish between process- and outcome-based measures. Process-based measures specify the method to be used, while outcome-based measures specify the desired result. Any new measures that are added must be shown to relate directly to a specific need that the agency has identified.

Executive and Business Dashboards

The agency developed two dashboards to serve internal and external stakeholders. The first dashboard created was an Executive Dashboard that was visible to anyone internally or externally. This dashboard includes progress towards performance targets in the areas of pavement preservation, safety, and project and program delivery. The second dashboard developed was the Business Dashboard, which is only accessible to WVDOT staff since it contains all of the details for reporting. The goal of these dashboards is to show transparency and results in order to improve staff morale and public perception.

Budget Approaches

WVDOT developed a pilot project to revise how budgets are created. The new process was focused on performance-based budgeting. Three districts inventoried and rated their infrastructure to set target goals for a performance or service level. The budgets included specific projects selected to help achieve these outcome-based targets.

With this relatively simple plan, the agency demonstrated steps towards success. For example, their delivery of Statewide Transportation Program (STP) projects improved from 19 percent to 80 percent within 5 years.

FHWA Transportation Performance Management (TPM) Toolbox (FHWA 2017a)

The FHWA defines TPM as a strategic, data-driven approach that uses system information to make investment and policy decisions to achieve performance goals. TPM leads to improved performance since it matches project selection to desired performance outcomes and ensures that every dollar is spent to impact performance in a positive way.

There are ten TPM components that form the framework, however not all of these necessarily happen in order. The six numbered components are steps in the management process, while the four lettered components are success factors required in each step of the process.

1. **Strategic Direction:** The strategic direction establishes an agency's focus through well-defined goals and objectives, enabling assessment of the agency's progress toward meeting goals and objectives by specifying a set of aligned performance measures.

    1.1. Goals and Objectives: Goals are broad statements articulating a desired end state that provides strategic direction for an agency. Objectives are specific, measurable statements that support achievement of a goal.

    1.2. Performance Measures: Performance measures should be based on metrics that are used to track progress toward goals, objectives, and achievement of established targets.

2. **Target Setting:** Target setting uses agency tools and information to establish a quantifiable level of performance the agency wants to achieve within a specific time frame.

    2.1. Technical Methodology: Target setting requires the implementation of an evidence-based and data-driven approach for observing a baseline and evaluating a performance trend.

    2.2. Business Process: It also requires the establishment of an intra-agency process that includes internal coordination and collaboration to establish and modify performance targets.

3. **Performance-Based Planning:** Performance-based planning uses agency goals, objectives, and performance trends to drive the development of strategies and priorities in the long-range transportation plan and other performance-based plans and processes.

    3.1. Strategy Identification: Performance-based planning requires the development of a range of strategies for achieving desired outcomes through the use of available baseline data trends, forecasting tools, economic analysis tools, and management systems.

3.2. Investment Prioritization: It also requires the evaluation of tradeoffs across alternative investment scenarios based on consideration and comparison of their impacts on performance targets and goals.

4. **Performance-Based Programming:** When performance-based programming is in place, strategies and priorities are used to guide the allocation of resources to projects that are selected to achieve goals, objectives, and targets.

4.1. Programming Within Performance Areas: One approach to performance-based programming is to prioritize projects within a program area, such as pavements or bridges.

4.2. Programming Across Performance Areas: Another approach is to prioritize projects based on weights from multiple performance areas, such as considering the capacity, safety, and economic development enhancement for each project.

5. **Monitoring and Adjustment:** The TPM framework should include a set of processes used to track and evaluate actions taken and outcomes achieved.

5.1. System Level: The framework should include a well-defined performance-monitoring process to clarify the past and current performance.

5.2. Program/Project Level: It should also include a process for tracking program and project outputs, and their effects on performance outcomes.

6. **Reporting and Communication:** A variety of products, techniques, and processes are used in TPM to communicate performance information to different audiences for maximum impact.

6.1. Internal Reporting & Communication (internal audiences): Some products are appropriate only for internal reporting and communication.

6.2. External Reporting & Communication (customers, partners, elected officials, and other stakeholders): Other products, such as dashboards, are often used to communicate with external stakeholders.

A. **Organization and Culture:** The institutionalization of a TPM culture includes the components listed below.

A1. Leadership Team Support: A strong culture will have support from senior management and executive leadership for TPM.

A2. Roles and Responsibilities: Designated and resourced positions to support TPM activities are clearly defined and employees are held accountable for performance results.

A3. Training and Workforce Capacity: Activities that build workforce capabilities are provided to support TPM.

A4. Management Process Integration: Performance data is integrated with management processes as the basis of accountability for performance results.

B. **External Collaboration:** The framework includes established processes to collaborate and coordinate with agency partners and stakeholders on planning/visioning, target setting, programming, data sharing, and reporting.

B1. Planning and Programming: External partners are included in the planning process to establish and achieve performance targets.

B2. Monitoring and Reporting: External stakeholders are provided the information needed to support TPM.

C. **Data Management:** A TPM framework includes a set of coordinated activities for maximizing the value of data to an organization.

C1. Data Quality: Processes and organizational functions to ensure data are accurate, complete, timely, consistent with requirements and business rules, and relevant for a given use.

C2. Data Accessibility: Business units have access to key data sets.

C3. Data Standardization and Integration: Organizational processes are in place to integrate and compare data sets as needed to support transportation performance management.

C4. Data Collection Efficiency: Efforts have been made to maximize use of limited agency resources through coordination of data collection programs across business units and with partner agencies.

C5. Data Governance: Protocols have been established for accountability and decision making authority and collecting, processing, protecting, and delivering data.

D. **Data Usability and Analysis:** Useful and valuable data sets and analysis capabilities are available in accessible, convenient forms to support TPM.

D1. Data Exploration and Visualization: The framework establishes the availability and value of data, tools, and reports for understanding performance results and trends.

D2. Performance Diagnostics: The framework establishes the availability and value of data, tools, and reports that allow an agency to understand how influencing factors affected performance results both at the system and project levels.

D3. Predictive Capabilities: The framework establishes the availability and value of analytical capabilities to predict future performance and emerging trends.

Case Study I: Texas DOT 2017-2021 Strategic Plan *(Texas DOT, 2016)*

Texas Department of Transportation (TxDOT) developed a strategic plan for the five-year period from 2017 to 2021. Seven strategic goals were established that support statewide initiatives. They include:

1. Deliver the right projects: Implement effective planning and forecasting processes to select the correct projects and deliver them on time and on budget.

2. Focus on the Customer: The user must be the center of everything the agency does.
3. Foster Stewardship: Efficient use of resources must be ensured.
4. Optimize System Performance: Develop and operate an integrated transportation system that provides a reliable and accessible mobility enabling economic growth.
5. Preserve our Assets: Deliver preventive maintenance for the system and capital assets in order to protect investments.
6. Promote Safety: Accomplish a culture of safety.
7. Value our Employees: Well-being and development of employees must be respected and cared for.

To support the accomplishment of these goals, the TXDOT uses the performance measures listed below.

- Project development and delivery.
  - Effective planning, design, and management of transportation projects.
    - Percent of design projects delivered on time.
    - Percent of construction projects completed on budget.
    - Percent of two-lane highways 26 feet or wider in paved width.
    - Percent of construction projects completed on time.
  - Plan, design, and manage transportation projects with in-house resources.
    - Number of construction projects preliminary engineering plans completed.
    - Dollar volume of construction contracts awarded in a fiscal year.
    - Number of projects awarded.
- Routine System Maintenance.
  - System Maintenance.
    - Percent of bridges rated in good condition or higher.
    - Percent of highway pavements in good or better condition.
    - State maintenance assessment program condition score.
    - Statewide traffic assessment program condition score.
  - Contracted Routine Maintenance.
    - Number of lane miles contracted for resurfacing.
  - Routine Maintenance.
    - Number of highway lane miles resurfaced by state forces.
- Optimize Services and Systems.
  - Support Enhanced Public Transportation.
    - Percent Change in the Number of Small Urban and Rural Transit Trips.

- Enhance Public Safety and Security.
  - Number of fatalities per 100 million miles traveled.
- Aviation Services.
  - Percent of General Aviation Pavement in Good or Excellent Condition.
- Support and Promote General Aviation.
  - Number of Grants Approved for Airports Selected for Financial Assistance.
- Ensure Rail Safety through Inspection and Public Education.
  - Number of Federal Railroad Administration (FRA) Units Inspected.

Through the implementation of the strategic plan, TxDOT expects to continue down this path to further improve employee, customer, and stakeholder satisfaction.

Case Study II: Washington DOT 2016 Gray Notebook *(Washington State DOT 2016)*

Washington State DOT (WSDOT) implemented the Gray Notebook 15 years ago to provide insight to external stakeholders regarding how the DOT is performing. This notebook serves to provide agency transparency in a format that is easy to read and understand. WSDOT utilizes six main transportation policy goals, each with individual performance measures, subgoals, and desired trends:

1. Safety: provide and improve safety and security of transportation customers and system.
   - Rate of traffic fatalities per 100 million vehicle miles traveled statewide.
     - Goal: <1.00.
     - Desired 5-year trend: decreasing.
   - Rate of recordable incidents for every 100 full-time WSDOT workers.
     - Goal: <5.0.
     - Desired 5-year trend: decreasing.
2. Preservation.
   - Percentage of state highway pavement in fair or better condition by vehicle miles traveled.
     - Goal: ≥ 90.0 percent.
     - Desired 5-year trend: increasing.
   - Percentage of state bridges in fair or better condition by bridge deck area.
     - Goal: ≥ 90.0 percent.
     - Desired 5-year trend: increasing.
3. Mobility (congestion relief).
   - Highways: Annual (weekday) vehicle hours of delay statewide at maximum throughput speeds.
     - Desired 5-year trend: decreasing.

  - Highways: Average incident clearance time for all Incident Response program responses.
    - Desired 5-quarter trend: decreasing.
  - Ferries: Percentage of trips departing on time.
    - Goal: ≥ 95.0 percent.
    - Desired 5-year trend: increasing.
  - Rail: Amtrak Cascades on-time performance.
    - Goal: ≥ 80.0 percent.
    - Desired 5-year trend: increasing.
4. Environment.
  - Number of WSDOT stormwater management facilities constructed.
  - Cumulative number of WSDOT fish passage improvement projects constructed.
    - Desired 5-year trend: increasing.
5. Stewardship.
  - Cumulative number of Nickel and TPA projects completed and percentage completed on time.
    - Goal: ≥ 90.0 percent.
    - Desired 5-quarter trend: increasing.
  - Cumulative number of Nickel and TPA projects completed and percentage completed on budget.
    - Goal: ≥ 90.0 percent.
    - Desired 5-quarter trend: increasing.
  - The variance of total project costs compared to budget expectations.
    - Goal: On or under budget.

WSDOT's Gray Notebook also reflects the objectives outlined in the strategy plan in place at the time this document was written (2014-2017). The plan focuses on how limited resources are invested in order to deliver projects. The strategic plan is based on the following six goals:

- Strategic Investments: Effectively manage system assets facilities and multimodal investments (e.g., aviation, bridges, capital facilities, ferries preservation, highway maintenance, and pavement conditions) on corridors to enhance economic vitality.
- Modal Integration: Optimize existing system capacity through better interconnectivity of all transportation modes (e.g., ferries, freight, highway system safety, pedestrian and bicyclist safety, rail, and trip reduction).
- Environmental Stewardship: Promote sustainable practices to reduce greenhouse gas emissions and protect natural habitat and water quality (e.g., environmental compliance, fish passage barriers, wetlands protection, and air and water quality).

- Organizational Strength: Support a culture of multi-disciplinary teams, innovation, and people development through training, continuous improvement, and Lean efforts (e.g., worker safety and health, workforce levels, and training).
- Community Engagement: Strengthen partnerships to increase credibility, drive priorities, and inform decision-making (e.g., Disadvantage Business Enterprise, local programs).
- Smart Technology: Improve information system efficiency to users and enhance service delivery by expanding the use of technology (e.g., tolling, travel information, commercial vehicle information systems, and networks).

The Gray Notebook serves as a transparent link between WSDOT and various stakeholders and has improved agency credibility through increased transparency.

Case Study III: North Carolina DOT 2015 Annual Performance Report *(North Carolina DOT 2015)*

During the 2015 fiscal year, the NCDOT established a 10-year program for transportation projects that was designed to use available funding more effectively than in prior years to better support economic growth, job creation, and quality of life throughout the state. The schedule included nearly three times as many projects as had been completed in previous 10-year periods with similar funding. This aggressive schedule was accomplished by rearranging available funds so that NCDOT could address agency priorities while providing flexibility to accommodate local needs.

One of NCDOT's priorities is to be accountable and transparent by making the transportation systems safer, providing outstanding customer service, maintaining infrastructure effectively and efficiently, providing economic growth through a good use of infrastructure, improving the reliability and connectivity of the transportation system, and retaining staff by making the organization a great place to work. For the 2016 fiscal year, these six core goals were addressed using eight executive-level performance measures, as documented below.

- Safer: Reduce fatalities by at least 2 percent or greater.
- Customer Service: Achieve an overall customer satisfaction of 85 percent or greater.
- Deliver and Maintain:
  - Let to contract at least 85 percent of planned projects on schedule.
  - Achieve an infrastructure health composite index of 75 percent or greater.
- Reliability and Connectivity
  - Increase the percentage of time when travel times are met based on highway speed limits to 80 percent or greater.
  - Increase the percentage of time when trips with published schedules are met to 80 percent or greater.
- Economic Growth: Increase the economic vitality of North Carolina.
- Great Place: Achieve an employee engagement survey score of 5.25 or greater.

Besides these executive-level performance measures, additional area-specific measures were established for safety, mobility, infrastructure health, and workplace.

- Safety: Make the transportation network safer.
  - Statewide network fatality rate (Target: ≤1.30).
  - Percentage of surveyed North Carolina using a seat belt (Target: ≥ 90 percent).
- Mobility
  - Average statewide accident clearance time (Target: ≤ 70 min).
  - Travel time index for surveyed interstates (Target: ≤ 1.02).
  - Percentage of planned ferry runs completed as scheduled (Target: ≥ 95 percent).
  - Percentage of planned passenger trains arriving on schedule (Target: ≥ 80 percent).
  - Percentage change in Ports Authority cargo movements (Target: ≥ 5 percent).
- Infrastructure
  - Percentage of bridges rated in good condition (Target: ≥ 65 percent).
  - Percentage of pavement miles rated in good condition (Target: ≥ 70 percent).
  - Average rest area condition score (Target: ≥ 90).
  - Average highway feature condition score (Target: ≥ 84).
- Works Well
  - Percentage of STIP-only work program projects on schedule (Target: ≥ 85 percent).
  - Percentage of division-managed non-STIP projects on schedule (Target: ≥ 85 percent).
  - Percentage of construction projects completed on schedule (Target: ≥ 85 percent).
  - Total budget overrun for completed construction projects (Target: ≤ 5 percent).
  - Average statewide environmental compliance score on construction and maintenance projects (Target: ≥ 7.5).
  - Percentage of the overall budget for administrative costs (Target: ≤ 7.6 percent).
  - Percentage of NCDOT's total budget expended on external goods, materials, and services (Target: ≥ 60 percent).
  - Percentage reduction in customer wait times at DMV facilities (Target: ≥ 40 percent).
  - Percentage of surveyed customers satisfied with transportation services in North Carolina (Target: ≥ 75 percent).
- Great Workplace
  - Percentage of employees retained after three years (Target: ≥ 90 percent).
  - Employee safety index (on-the-job injuries/accidents, lost work days), (Target: ≤ 6.16).

Through these goals and performance measures, NCDOT's intent is to be transparent and accountable for its decisions and actions, allowing the user and stakeholder to be aware of the existing condition and situation of their assets.

Case Study IV: Utah Department of Transportation Strategic Direction 2016 *(Utah DOT 2016)*

Utah DOT (UDOT) emphasizes five key areas to reach the agency's vision and mission:

- Integrated transportation to better serve all transportation interests.
- Collaboration with communities as well as public and private partners to achieve their individual visions.
- Education of agency staff and younger generations.
- Transparency through fairness and openness.
- Quality through each DOT process.

UDOT established three main goals, each with individual performance measures considered to have a positive outcome towards the agency's vision and mission.

Goal 1: Zero Crashes, Injuries, and Fatalities

Engineering, educational, and employee and partner safety are the way through which the agency intends to achieve this goal. Engineering tools are utilized to easily identify and solve safety issues at every phase of a project (planning, design, construction, and maintenance) as well as areas of concern related to existing infrastructure. Driver education is critical to reducing accidents, hence the outreach to audiences to improve awareness of the five critical driver behaviors: seat belt negligence and aggressive, drowsy, distracted, and impaired driving.

Employee and partner safety is addressed through a behavior-based safety (BBS) program in which employees observe themselves on the job and provide safety feedback to correct risky work practices. Data is then analyzed to make improvements to the safety culture, systems, and communication practices. Performance measures for this goal are vehicle incidents, injuries reported, lost time injuries or illness, teen driving behaviors with parents involved in training, seat belt usage trends, and pedestrian, bicycle, and motorcycle fatalities.

Goal 2: Preserve Infrastructure

Cost minimization and benefit maximization through regular maintenance prevents deterioration and provides the best value at the lowest life cycle cost. Asset management is key to achieve the performance measures. For this goal, the following three main areas were targeted:

- Pavement
  - Interstate pavement condition.
  - High-volume pavement condition.
  - Low-volume pavement condition.
- Bridge

  - NHS Inventory Health Index.
  - State Inventory Health Index.
  - Local Federal Aid Health Index.
- Maintenance
  - Snow and ice control.
  - Litter pickup.
  - Pavement striping.
  - Sign repair and replacements.
  - Guardrail maintenance.
  - Rest area maintenance.

Goal 3: Optimize Mobility

UDOT operates the transportation system as efficiently as possible with new and innovative strategies. These strategies consider mobility in design and planning to add capacity. The main strategies and their respective performance measures are listed below.

- Signal Optimization: Percent of vehicles arriving on green.
- Reliability: I-15 (southbound and northbound) delay by county.
- Managed Lanes: HOV/Express Lanes people throughput.
- Add Capacity: Delay along the Wasatch Front.

These goals were established to improve the internal and external stakeholder perception of overall network performance.

NMDOT's Process to Make Organizational Change (ATRI 2003)

Overview

In 2003, New Mexico finalized the process to shift its statewide transportation agency's organizational culture and practices from that of a traditional state highway and transportation department to one of a department of transportation. Prior to 2003, the New Mexico State Highway and Transportation Department (NMSHTD) primarily facilitated the planning, building, and maintaining highways and state roads. Today, the New Mexico Department of Transportation (NMDOT) is a multimodal transportation agency with more efficient and effective decision-making processes that integrate service delivery and policy development resulting in New Mexico having a single, balanced, and integrated transportation network system. The following summary outlines the process for organizational change that New Mexico went through to transition to the NMDOT of today.

Changing the Vision and Leadership Structure

According to the report, a successful shift in organizational structure hinges on the employees and managers across the agency understanding and agreeing with the set of principles and values that will be followed. To achieve this, a vision must be created. However, for the vision to be

understood and followed, several representatives from within each agency bureau and division must be involved in the process. NMSHTD did that by establishing a steering committee that communicated with the Governor and Cabinet Secretary to create and formally adopt the new vision statement for the agency.

Along with the new vision statement, a policy guidance document, training, and planning activities were created by the steering committee. The group determined that it was key that administrators from inside the agency, who were respected and understand the existing organizational culture, were tasked with leading each department through the changes in thinking and business practices that the new vision required.

To train all the NMDOT staff and stimulate the creative flow of ideas among the several departments, the steering committee held a statewide summit. The summit assisted in making the new vision, structure, and guidance policies better understood by the leadership team and agency personnel, making the transition as smooth and efficient as possible.

Involving the Public

Considering how effective implementing the new vision, structure, and policies could be with the DOT staff, a shift in organizational structure at the agency would not have been successful without the involvement, support, and feedback from the public and the external stakeholders. To assist in this area, NMDOT leadership conducted a multimodal workshop for the public and the external stakeholders to share the vision. The workshop assembled private sector partners and state, tribal, local, and modal constituencies to provide their input and thoughts on the new vision, practices, policy development, and future projects. The workshop primarily built on individual worksheets and group exercises with discussion.

According to the report, the multimodal workshop was essential to ensure the state DOT's vision and practices resulted in providing services that met the quality-of-life goals desired by the citizens of the state. Such goals included transportation options, accessibility, energy efficiency and sustainability.

Performance Measures: The Link Between Vision, Practices and Outcomes/Targets

As reported by ATRI (2003), performance measures are expressions that provide vital feedback by monitoring the progress a DOT is making toward achieving the goals of the overall vision. By regularly monitoring the performance measures, a clearer picture of community or regional change can assist citizens and community leaders to determine if their desired outcomes are being realized or if changes to the DOT goals are warranted.

To help determine the best performance measures to meet NMDOT's new goals and vision, the following key documents were developed to guide the process:

- A "Guiding Principles" document that included information on the DOT's partnership with tribal and local governments, environmental responsibility, safety and security, efficient use of public resources, and economic vitality. The aim of this document was to help integrate and advance the business practices of the agency in alignment with the governor.

- A "Commitment to Environmental and Energy Action" document that recognized the direct, indirect and cumulative effects of transportation decisions on the natural and cultural environment, on communities, and on energy consumption. (ATRI, 2003).

To ensure that the new organizational practices were implemented successfully, a funding plan was needed with mechanisms to provide adequate dedicated funding to accomplish the goals and vision of the DOT. Safety was another goal that was identified for which operational performance measures were appropriate. A change in focus on how safety performance measures were determined was developed by shifting the focus from the perspective of people using cars on the network to customers in general. This change in perspective resulted in preference being given to projects that included accommodation of bicycle, pedestrian, and transit modes. The new perspective also prepared for new technology, such as Intelligent Transportation Systems (ITS), used in both urban and rural centers to help the DOT achieve agency multimodal goals beyond safety.

Recommendations and Conclusions

As a result of the multimodal summit and workshop and conversations with national transportation experts and stakeholders, NMDOT developed 15 recommendations to transform its organization from a traditional state highway and transportation department to a DOT, as listed below (ATRI 2003).

- Single Agency Structure – To avoid fragmenting the transportation system, tie the separate transportation network entities together under a single agency, including ownership, operation, and regulation for local airports, urban and rural transit systems, the State highway system, and the local road networks.
- Multimodal Investment Study – Conduct a complete and thorough multimodal investment study, establishing a prioritized list of projects from the data collected. Define goals for a balanced multimodal transportation system. Plan, integrate, and track the mode split percentages.
- Modal Vision Alignment – Reorganize NMDOT Districts with a multimodal vision. Prioritize and locate transit "hubs" at these locations with ties connecting to others around the metro and surrounding areas. Identify major traffic generators (e.g., Sunport, Intel, Downtown and Uptown Albuquerque) and their intermodal characteristics and design vehicles. Conduct a study to determine if the existing transportation system adequately supports the needs of major traffic generators and determine which alternative modes could best provide congestion mitigation.
- Transportation Planning – Study the planning processes in other states. Restructure the planning process of the State Transportation Improvement Plan (STIP) to ensure that Tribes, stakeholders, and modal constituents have more input into the process resulting in increased projects from this input. Develop a comprehensive set of performance and accountability indicators to measure trends and progress toward meeting multimodal goals.
- Early Review – Ensure that projects early in the planning and design stages incorporate pedestrian, bicycle, and transit facilities. Include options for short trips as well as through/regional trips in the corridor, and project specific studies.

- Multimodal Districts – Establish multimodal transportation districts to include designated areas of influence around transit stations and stops for pedestrian and bicycle access; access management programs of state and local agencies that address pedestrian, transit, and bike facilities; funding for land assembly for transit supportive development with the condition that the investment proceeds are used for eligible transit activities, identification of redevelopment opportunities in conjunction with corridor studies; and Safe Routes to School. The goal is to reduce vehicle miles traveled in both existing and new areas where pedestrian accommodations are absent or inadequate.
- Design Guidelines Modification – Adapt the highway design guidelines, manuals, and standards to a perspective that also considers the non-automobile perspective. A single focus on throughput leaves pedestrians out of the equation. Incorporate and elevate pedestrian, bicycle, and transit issues in traffic operation standards/regulations. Overhaul or reorient the standard technical tools to reflect the full range of options and incorporate a wider variety of trips via transit, walking, and bicycling.
- Multimodal Training and Communication – Provide training to the NMDOT staff to facilitate their understanding of changes they need to embrace in their work and innovate with new answers to old problems. Clearly and frequently convey information to all NMDOT personnel about the new direction of the Agency informing them and how their jobs will be affected. Communication with Agency employees about change in direction will help them chart their course and navigate their way through the changes.
- Go-And-Grow For Transit – Conduct best practices research on methods to better market transit, build ridership, tie transit growth to economic development activities, and make transit more customer-friendly. From this information, create a "Grow-and-Go Transit Marketing Toolkit" and make it available to all transit providers.
- Intra-Departmental and Inter-Agency Coordination – Conduct a study to determine ways the inter-agency coordination of transportation modes can be achieved that eliminate duplication of transportation services. Establish an intergovernmental transportation Committee on coordination of interagency transportation services.
- Legislation – Sponsorship by the New Mexico Congressional Delegation of new federal legislation to reauthorize the State Infrastructure Banks (SIBs) program is needed. SIBs loan money to complete the financing for a project. Once repaid, that money can be available to a State for a later project.
- Context Sensitive Design Projects – Include accommodation of pedestrian, bike, and transit facilities, including sidewalks, transit stops, bike lanes, pavement markings, etc., in project ranking criteria for reconstruction of existing roadways, building of new facilities, and traffic operations projects. Adjust the current program list to reflect new priorities and produce new look projects as soon as possible.
- Use Of State-Owned Assets – Conduct a study of State-owned, existing rail lines to determine which are suitable for use as bicycle, pedestrian or equestrian routes, paths, or trails. Find new and innovative purposes for State-owned assets which are unused or underused, such as excess right of way and abandoned rail lines.
- Safety – Conduct a study to determine the root cause of the accidents involving pedestrians in New Mexico. Develop safety projects throughout the state to provide a safer interaction between the pedestrians and other modes of transportation.

- Security – Ensure that the information architecture at the various Ports of Entry are compatible and easy to learn and use. Use ITS technology to make New Mexico's borders safe and strong while accommodating interstate and international trade and transport quickly and efficiently.

ATRI (2003) reported that the most pivotal link to effective organizational change for the NMDOT was effectively and clearly communicating the agency's expectations and roles to internal staff, local officials, transit directors, external stakeholders, and the public. To improve its communication processes, NMDOT added local transit officials as advisors. These advisors helped NMDOT participate more fully in the Statewide Transportation Improvement Plan (STIP) to fund more transit infrastructure projects into ongoing and future construction projects.

Summary

As documented in several literature sources, an effective performance management program should help an agency show progress in meeting goals through measurable parameters, allocate available resources according to these goals, and demonstrate accountability to stakeholders and users. Performance management is successful when performance measures are aligned with the agency's mission and stated goals, and all agency employees can see their role in achieving that mission. To be successful, agency leaders have played an active role in the process through periodic review and realigning agency resources and targets as needed. In addition, performance measures must be credible and used in making decisions to improve accountability and acceptance within the agency.

CHAPTER 3: SUMMARY OF NDOT CURRENT PERFORMANCE MANAGEMENT PRACTICES

Background

This chapter describes NDOT's performance management culture, including how NDOT employees view the agency's current performance measures and how practices related to performance measures impact the agency's culture. Fourteen interviews were conducted in September 2016 with executives and managers within NDOT to explore the agency's performance management culture. The executives were sampled from the agency's Director's office and the main divisions that "own" performance data supplied to the PAD through performance reporting metrics. The terms "executive" and "manager" are used throughout the document to refer anonymously to either Director's office staff or the division heads who agreed to be interview participants. The interview participants are listed in Appendix A.

Many agencies have made incremental progress with performance management programs that are based on formal performance measures. From the literature review, performance management benefits that have emerged nationally are seen through initiatives to communicate agency priorities to employees and management, share agency accomplishments with the public, and fund projects that most effectively assist the agency in meeting its mission and goals. Through the interviews conducted with NDOT agency management, evidence of these types of success are provided.

Questions were asked in the interviews to allow respondents to describe how performance measures were used in decision making, what positive outcomes had happened from using performance measures, and how the measures had been used for planning. Respondents were also asked to relay how performance measures were used during daily operations, and what emerging trends were affecting the agency's use of performance measures. Interviewees were also asked to provide examples of actions that had been taken because of the performance measure results, to identify offices responsible for metric outcomes, and to summarize actions taken if targets were not achieved. Many examples were provided by interviewees to describe how performance measures were being used to manage the agency. They described ways in which the performance measures provided definitive benefits to conducting agency business, as well as challenges that were faced in using the performance measures. This chapter presents the interview findings.

Establish Relevant Measures

Substantial evidence was provided indicating that the performance measures used at NDOT support the agency's mission, vision, and agency objectives. Implementing performance management under AB595 focused the agency on strategic measures and maintained its accountability to the legislative body. In 2015, Nevada initiated a new strategic planning framework entitled the *One Nevada Transportation Plan*. The plan's goal was to improve Nevada's multi-modal transportation system and economic vitality while preserving Nevada's existing infrastructure and natural resources. The plan included performance measures related to agency goals which, in turn, aligned with the Governor's strategic goals for the State of Nevada. The performance measures that were included in the plan also addressed the Nevada Legislature's interests and AB595 reporting requirements. In addition to those measures required by AB595, members of NDOT leadership and FHWA, through twelve meetings,

designated additional performance measures for the S&O Agreement to remain in compliance with MAP-21 legislation and subsequent requirements. These measures were implemented between NDOT and the FHWA Division office on October 1, 2016. Interviewees expressed that these efforts to re-examine and evaluate the agency's mission, vision, and goals ensured that the selected performance measures appropriately represented the core agency business functions at the time.

Interviewees indicated that benefits have resulted from using the performance measures documented in the *One Nevada Transportation Plan*. Two managers found that business planning to meet performance targets assisted them in discussing priorities for the upcoming year. The measures allowed them to identify common performance measures across divisions and establish resource plans that enabled both divisions to meet their targets.

As changes in oversight and public access to the agency have been advancing, NDOT has been adapting its practices to incorporate emerging trends into its practices. One of the most pertinent emerging trends is the recognition that maintaining favorable public opinion and confidence is critical to achieving an agency's mission. The public now expects more data transparency than in the past, a better explanation of how tax dollars are used, and regular reporting from easily-accessible media channels. Therefore, it is important for NDOT to be aware of how people get information and use the best methods possible to report regularly to the public. The Communications Division has established a primary performance goal to increase customer engagement. To support this effort, the Division has implemented the use of short videos to inform the public though its own YouTube page and increased its use of social media including Twitter and Facebook.

Meet Regulatory Requirements

The agency is using performance measures to comply with Federal regulatory requirements in MAP-21 and the FAST Act. In May 2015, FHWA and NDOT published a revised stewardship and oversight agreement. According to one of the interviewees, the revised agreement has aided NDOT in providing a consistent approach to meeting expectations with FHWA. This has mainly been achieved by formalizing the assumed responsibilities within the agency and strengthening communication among the division heads who oversee the performance measures. The performance measure that has been most significantly impacted by the revised agreement is the measure related to streamlining project delivery, schedules, and estimating.

An important emerging trend identified in the interviews is passage of federal regulations that standardize measures within each transportation agency. According to FHWA, these regulations are designed to strengthen national reporting and to synchronize national performance measures with state practices. Increased national tracking has the potential to result in improved national accounting, improving the consistency across agencies, and creating a performance-based national picture for the federal program (FHWA).

Make Decisions

A main topic covered in the interview discussions was to identify how performance measures were being used to make agency business decisions. The two most prevalent responses were:

- The performance measures are used to guide project selection to meet agency goals.

- The agency does not use performance measures to make decisions.

Project Selection

NDOT's Statewide Transportation Improvement Plan (STIP) is developed using performance measures to guide project selection. Projects included in the STIP are those that are identified through a project tradeoff analysis. Using performance data to prioritize projects is expected to make the STIP process more meaningful to the agency in aligning with strategic goals since a transparent project selection process helps build the legislature's and local governments' confidence in the agency's decision process.

NDOT intends to use performance measures in conjunction with other elements to allocate project funding based on project benefits towards improving system performance. The NDOT Director suggested that under current fiscal constraints, additional measures or weighting factors may be required to prioritize projects related to commuter mobility and economic development. He also suggested using performance measures to link current funding choices to the project backlog. This linking would help clarify the transportation needs to stakeholders, give the divisions a larger stake in controlling performance measures, and better allocate funding and project selection to sustain long-term priorities. He is especially interested in shrinking the project backlog by reducing scope creep and resizing projects to address only the most prominent needs.

The Nevada Transportation Board (TB) meets with the agency Director monthly and a performance measure discussion is occasionally an agenda item. In addition, the TB is interested in how well the Governor's goals, outlined in the *Strategic Planning Framework* and related to the *One Nevada Transportation Plan*, are being achieved by the agency. The TB is looking to balance projects across the state and across urban and rural areas. The agency believes that an enterprise prioritization and resource optimization process has the potential to use project weights to prioritize NDOT's program so the desired balance is achieved in a transparent manner.

To improve the performance management collaborative process so that the internal staff are more invested, NDOT's Director has broadened the conversation on project selection to teach technical leads about the prioritization process that is driven by performance. Since the trade-off optimization process is new and evolving, the Director realized that some division heads may be unfamiliar with its potential application.

Resistance to Performance-Driven Decisions

Some agency executives admitted having a difficult time relating the agency's mission to some performance measures used. This is illustrated in a manager's comment that "in his opinion, some of the current performance measures have a weak link to NDOT's mission and vision." Another interviewee shared that "the performance measures do not keep him from making good engineering decisions. Another interviewee stated that he is still trying to understand the performance measures that have been assigned as his responsibility. These examples illustrate that several executives believe that performance measures could be better aligned with actual responsibilities. For instance, if a $20 million project must be pulled from the program schedule and replaced by two smaller projects, the division staff exert extraordinary effort to ensure the two new projects meet the development schedule, but the performance measure characterizes

dropping the original project as a staff failure. That makes it difficult for the division staff to feel ownership in the performance measure. Interviewees indicated that measures should be predominantly within the control of the office assigned responsibility.

One person reported that the agency currently is not performance driven and has a difficult time incorporating performance measures into its daily practices. This is reflected by an interviewee who stated "[we] do not use performance measures right now at all." The interviewee reasoned that since NDOT is a relatively small agency, performance measures are not necessary to make data-driven decisions. Several individuals reported that there is no perceived link between performance measure reporting and funding decisions. This makes it difficult for division leads to justify putting effort into data collection and analysis if the information is not used. Additionally, several interviewees expressed the opinion that the performance measures serve as a good comparison between fiscal years, informing the agency how it is doing in comparison to previous years, but not necessarily equipping the agency with the tools and methods to tell their story.

Some apprehension to using performance measures to make decisions was also apparent in discussing the source data. For the day-to-day operations of most divisions, the performance measure reports and source data were readily available. Most owners have been able to collect and store their data electronically. However, some division heads were not sure how accessible the data was. Some interviewees shared that although their data is readily available, it is not used frequently. Rather than utilizing the data on a regular basis, the data is archived until the following year. One manager stated that the data collection processes are "easy," but the required data analyses are challenging. This manager would like to see his division go from measuring to managing performance.

Be Accountable

Connor and Smith (2011) stress that linking responsibility for metric outcomes to agency staff is a priority in creating a performance management culture. Responses varied widely among the executives regarding who is responsible for a given metric within the agency. For instance, some interviewees believed that the Director's office —the executive team—is responsible for metric outcomes. Others stated that no single position is responsible for the outcome of a metric due to the measure's broadness and cross-functional application. Others shared that the responsibility for metric outcomes falls on the division head where the measure resides rather than being shared among all of the divisions that contribute to the achievement of the measure.

Several interviewees indicated that it is the agency Director's responsibility to assign responsibility for the performance measures to the division heads. Also, it was understood that the Director oversees the agency's overall operation, so a large amount of accountability falls to the agency Director. The Director has fully endorsed the existing performance measures, and thus acknowledged accountability for the metric outcomes; however, he expressed interest in sharing responsibility for the metric outcomes with Deputy and Assistant Directors and managers, and would like to see them use their resources to engage and contribute more to the agency's goals.

Several interviewees viewed NDOT's current performance measures as overarching or too broad to implement effectively in their daily division practices, and accordingly, should not be a point of personal responsibility. For instance, there are several measures that require contributions

from multiple divisions or that should more appropriately be assigned as a responsibility of an executive level owner rather than the division level. To narrow the measure application, a few divisions have chosen to use subsets of the performance measures for monitoring purposes while the actual performance measures are being used as "just a metric for reporting purposes." Using performance measure data subsets is an attempt by the agency managers to adopt the performance measures in a logical manner and to track trends managed by the divisions.

For example, one agency-wide performance measure is to reduce fatal crashes. This measure has two metrics for tracking purposes: number of traffic fatalities, number of fatalities per 100 Million Vehicle Miles of Travel (VMT), . The same measures are used in the Nevada Strategic Highway Safety Plan endorsed by 19 member agencies including NDOT, the Nevada Department of Public Safety, and the Nevada League of Cities. The NDOT Traffic Safety Division evaluated performance measure data and noted that there were 326 fatalities in the year 2015 while the performance trend had anticipated 278 fatalities. The Traffic Safety staff then determined that 29 percent of the fatalities in these crashes were unbelted. Nevada has a seat belt law, which is enforced by the Nevada Highway Patrol and local law enforcement agencies. Nevada also has an observed seat belt usage near 85 percent, indicating that 29 percent of the vehicle fatalities came from 15 percent of the total population. Therefore, the Traffic Safety Division recommended to the Executive Committee on Traffic Safety—an entity outside of NDOT—that additional funding be put toward minimizing these unbelted fatalities and educate drivers to wear their seatbelts. This example illustrates that traffic safety in Nevada is affected by the work of many collaborative boards and agencies. NDOT Traffic Safety Division's efforts contribute to reducing fatalities, but they rely on other agencies to endorse the recommendations and implement the solutions.

One sentiment expressed in the interviews was that the internal staff within the divisions are not engaged in setting the goals and objectives, and thus do not fully understand and commit to the organizational changes necessary to support the performance management culture. A manager indicated that if decisions on how goals are met were developed through the divisions, they would have more "buy-in" from the internal staff who conduct the agency work and who monitor the targets, resulting in better performance overall within the agency. Achieving this employee-engaged framework is a challenging task because the Governor and TB ultimately determine which projects are funded. In addition, some executives were concerned that when determining which projects to undertake, little attention was paid to their effect on performance. An interviewee noted that to encourage more internal staff to "buy-in" to the process, NDOT has involved the divisions in developing performance measures and targets. This involvement was necessary and beneficial to strike the right balance in project selection including the direction of the appointed Board members and the professional staff recommendations to achieve performance targets and to set agency direction. The suggestion continued that this involvement could also improve NDOT's overall transparency and lead to a clearer understanding of the roles in each area and where transportation funding is used and why. This latter area was identified as an area of concern for some divisions that believe the funding they receive is fixed and independent of how thorough their reports are or the funding levels needed.

The Communications Division Director, related how the agency/division metrics tie into their employee performance measure reviews. This was the only division lead who described a clear connection between performance measures and employee performance plans. He indicated that the Division was responsible for managing the communications performance measure and was

also responsible for producing the agency's communication plan. Mr. Sever shared the responsibility for the performance measure for social media contacts by including the target in staff members' job performance plan and accountability was assigned for specific tasks related to the measure. As part of the employee performance evaluation process, the performance metrics and targets are reviewed. Through the employees' efforts, targets were achieved. So, during the review discussion, the employees and their supervisors agreed that more challenging targets could be assigned and the agency target could be adjusted. This enabled the agency communication plan to be revised along with the resulting performance target for social media contacts. By making staff accountable for achieving the target and by reviewing performance periodically, the division was able to exceed its social media goal by over 40 percent and reach more Nevadans. Reporting the performance measures both quarterly and annually required the Communications Division to assess the data and use the metrics more in an operational setting to guide management decisions. The frequent reporting also allowed management to adjust its targets or reallocate resources to achieve and to maintain relevance with the agency's annual goals.

The diverse opinions regarding measure accountability indicate that some divisions may have measures where there is confusion as to who has responsibility for achieving the target outcome.

Change Business Practices

AASHTO (2003) recommends that performance measures be reviewed and adjusted periodically to remain relevant to agency goals and objectives. As processes improve or the financial climate changes, expectations for project delivery and operational efficiency also change. NDOT's managers reported periodically reviewing performance measure data and analyzing inconsistent results identified. For instance, tracking performance measures throughout the fiscal year helped the NDOT Construction Division control construction engineering cost accuracy by ensuring that staff time was charged appropriately. After a detailed review of the reports and the source data, inconsistencies were noted in the way engineering cost metrics were reported based on which projects were active and included when the reports were generated. The Division found that the calculated performance metric fluctuated due to inconsistencies in how costs were being tracked. After re-defining the reporting process, the calculation for the metric used a static and more consistent data set. Previously, metrics were calculated using active contracts and contracts that had just been closed. As a result, the data used for reporting purposes was variable from one cycle to the next. Open contracts are no longer included when reporting this measure, and the reporting is now more consistent.

As discussed earlier regarding the Communications Division, its performance measures have evolved over multiple revision cycles. The performance measures have guided changes to communication strategies, enabled the agency to achieve its goals within the strategic timeline, and facilitated proactive planning.

Performance measures may also need to be adjusted periodically based on how practices change. The Bridge Division reported that it has used one AB595 performance measure: to replace or rehabilitate at least one structurally deficient bridge per annum. This measure is considered to be more of a tracking metric rather than a measure of organizational effectiveness by the Bridge Division. By meeting the target, the agency is able to report that at least one bridge was removed from the structurally deficient bridge list. But the Bridge Division implements projects to preserve bridges' structural capacity rather than allowing them to deteriorate to the structurally

deficient category. The Bridge Division suggested aligning the AB595 measure with the FHWA S&O measure which would require moving away from using primary structural elements for sufficiency ratings and moving towards the sub-element ratings as metrics. This move could potentially help solidify the ties between performance measures and daily work activities, project benefits, and decision-making processes.

Some interviewees noted that, in practice, performance measures were only reviewed during periodic meetings and the analysis and explanations were often just a "cut-and-paste" from the last period's report. One division stated that eight explanations for their nine performance measures were copied from the previous year. This supports the viewpoints that the performance measures may be uncontrolled by the division or not linked well to daily tasks.

Paying attention to performance targets has also contributed to collaboration between divisions. For instance, one performance target was established to maintain the NDOT building facilities by increasing their assessed condition by at least 2 percent annually. However, most funding available for facilities is spent on increasing capacity rather than heavy maintenance that could improve conditions. The operations staff, who maintain NDOT facilities, worked collaboratively with the roadway maintenance and the Americans with Disabilities Act (ADA) staff to pool resources and achieve the target. Their efforts resulted in a 3 percent increase in the condition of NDOT facilities for 2016.

The Materials Engineer indicated that the pavement project backlog measure was evaluated and revised to provide pavement condition information differently. For example, rather than estimating all the work recommended in an 8-year pavement maintenance and rehabilitation plan (valued at $2B), they developed a metric strictly based on condition ratings. Using the new metric, and projecting projects required during a 3-year program, provided preservation and maintenance funding recommendations more in line with the agency allocations. This example illustrates the importance of periodically validating the metrics to ensure they relate to the agency's mission and messaging to the public and other stakeholders.

Use Tools to Manage Performance

Emerging technology and new processes have permitted advancements in how the agency uses performance measures. The tools may be summarized as software advancements, technological equipment being installed, and management systems to aid operations decisions.

According to multiple interviewees, the enterprise prioritization and resource optimization tool used by NDOT has improved transportation asset management efforts by optimizing the performance trade-offs considered during project selection. Incorporating performance measures in the software models helps drive NDOT's project selection process towards meeting agency goals and objectives. The tool allows the division heads to inter-relate measures and decision-making processes to increase awareness of how each program is connected. In addition, the tool is anticipated to help the agency establish achievable, practical, and measurable goals by effectively allocating the available budget. Implementing the resource allocation tool is one step the agency has taken to improve the linkage between strategic performance measures and project selection.

The Regional Transportation Commission of Southern Nevada works with NDOT and other partners to operate the Freeway and Arterial System of Transportation coalition. According to

the interview participants, Traffic Incident Management (TIM) and the Freeway Service Patrol (FSP) have been leading programs for adopting reliability measures, especially in the Las Vegas area. Using computer aided dispatch, closed circuit television cameras, and incident tracking systems, the Freeway and Arterial System of Transportation tracks incident occurrence, response, and clearance collecting data to calculate incident management metrics. The reduction in incident clearance times on highways and streets, a measure maintained by the Traffic Operations Division, has steadily decreased the average lane closure time per incident to below 10 minutes. This measurement data is used to set 30-, 60-, and 90-minute incident clearance goals that are used in conjunction with the FHWA S&O agreement. Although individually the 90-minute goal is a stretch goal, the 30-, 60-, and 90-minute goals have helped focus the effort to reduce clearance times among the coalition members. The Traffic Operations Division would like to implement a new statewide TIM measure to improve reliability and traffic operations, but similar monitoring, dispatching, and tracking tools are not available uniformly across Nevada.

NDOT's local partners have begun to use performance measures to achieve benefits in public relations. For example, the Carson City Metropolitan Planning Organization (CAMPO) created a customer service interface tool called Carson City Connect. This application allows the public to send feedback and to report information to the MPO rapidly. The information is fed into a management system so that the issues identified can be responded to in a timely manner. Carson City Connect has greatly increased the communication between the public and the public works group, and enabled quick responses to issues, better result tracking, and lower response time metrics achieved.

Interviewees reported that there have been efforts to develop a dashboard to enhance the agency's communicating performance measures. They believe that providing timely, reliable performance management information builds confidence in the management team using the information to make decisions. The suggestion was made that the dashboard be available internally and externally, and contain both strategic and division level measures as they are introduced. The dashboard interface was also envisioned to provide access to data owners to better integrate source data and streamline the metric reporting process. .

Lessons Learned

NDOT currently reports performance measures internally, to the board, to the legislature, and to the FHWA. Based on interviews with executive staff, some performance measures are considered to be too broad to apply to typical business functions, so staff are not engaged and are not using the measures fully.

There are examples of how performance measures have improved agency performance. For instance, the Communications Division's performance metrics are reported on regularly, which led to revised communication plans and adjusted targets and resource allocation. The Traffic Safety Division used subsets of its performance metrics to help identify a main cause of the fatal crash statistics and allocate the necessary funding to reduce the number. Reviewing how the current measures reflect the agency's vision, mission, and daily activities may lead to more buy-in and bring more clarity as to who is responsible for metric outcomes.

NDOT's use of monitoring and tracking tools has also led to the development and implementation of performance measures that have improved customer mobility and system

reliability. Also, the use of short videos and YouTube has been effective in connecting with the public.

Despite the challenges and some evidence of frustration, most of the divisions want to continue using performance measures to aid in their decision-making process as performance measures help NDOT manage and maintain its facilities and infrastructure. Future performance measurement efforts can better link strategic and operational performance measures, and can be used in developing a performance management framework that involves division personnel in setting realistic performance targets that support NDOT's strategic initiatives.

CHAPTER 4: SUCCESS FACTORS IDENTIFIED FROM OTHER STATES' EXPERIENCE WITH TRANSITIONING TO A PERFORMANCE MANAGEMENT CULTURE

Background

In addition to the evaluation of NDOT's current PM practices, this study sought out other STAs that have successfully transitioned to a performance management culture. This part of the study involved a literature review to identify how other STAs have reshaped their culture while implementing performance management. Leading states were identified to participate in interviews that were known to the research team and the project panel as having implemented performance management. State DOTs that agreed to be interviewed were the Georgia, Michigan, North Carolina, Tennessee, and Utah DOTs. While each state DOT had different experiences to share, they each discussed communication efforts they conducted, engagement connections they pursued with employees, and steps taken to assign accountability for performance results to leads responsible for accomplishing their goals.

Connors and Smith (2011) define organizational culture as "the way people think and act." Organizational culture develops from the shared experiences, beliefs, and actions of the people within the organization. That is to say, actions taken by management become shared experiences, which through repetition and reinforcement, develop into beliefs that the organization conducts business in such a manner (Connors and Smith 2011). Because the experiences, beliefs, and actions of the people in the organization constitute the culture, it follows that the organizational culture produces the results. If different results or a different way of doing business is desired, the organization must demonstrate new actions to create different experiences, and thus, new beliefs by the people in the organization. "Whether managers realize it or not, they are creating experiences every day that help shape their organizational culture" (Connors and Smith 2011). Therefore, the cultural change must be led by the managers, directors, and executives who believe improvements in the way the organization does business are required. "From promoting someone or implementing new policies to interacting in meetings or reacting to feedback, these experiences foster beliefs about 'how we do things around here,' and those beliefs, in turn, drive the actions people take." Every leader within the agency must be engaged to lead a cultural change.

This chapter describes the actions taken by other STAs that impacted their culture, and therefore, changed the shared beliefs and experiences of the people within the organization. These actions led to a new way of doing business for the STA as a performance-managed or performance-driven agency. The information has been organized into the following categories: communications, engagement, and accountability. Topics included in each of the broad categories are listed in table 1.

Table 1. Actions leading to cultural change.

Action Categories	Topics Discussed
Communications	Mission, Vision, Goals, and Values Story-Telling Consistency Dashboards
Engagement	Goal setting Relevant measures Performance reviews Cooperative efforts Shared values Demonstrative decision making
Accountability	Job performance plans Performance goals Division business plans Executive buy-in Decisions made based on metrics Strategic adjustment

Communication

Communicating within the organization and with its stakeholders has been identified by many sources for promoting the desired agency culture. Connors and Smith (2011) call on leaders to communicate the vision for new agency results, to tell the success stories demonstrating a change, and to communicate the reasons for modifying current business practices.

Mission, Vision, Goals, and Values

A review of STAs web pages revealed that most STAs have very similar missions—moving people and goods with an emphasis on mobility, safety, economic vitality, and maintaining a healthy transportation infrastructure. These missions change slowly as compared to agencies' visions for the future. Agency visions may change due to changing customer expectations or reduced satisfaction, or they may change with new leadership appointed as the governing administration changes. An agency's vision may be established for a specific or a non-defined time horizon. Further, the goals that advance the vision may require a certain improvement annually, or identify a desired end state after 5 years. Performance measures are typically adopted to provide metrics for comparing achievement of agency goals. Agency values are intended to be guiding principles for how the agency conducts business. Mr. Carlos Braceras, the Director of the Utah DOT (UDOT), stated that UDOT's culture can be thought of as the shared values of its employees and stakeholders. By regularly communicating with agency staff through podcasts, welcoming new employees, or addressing the annual transportation conference, he ensures that the agency's mission and vision are clearly articulated to agency staff. By openly discussing the agency's mission, vision, and goals so routinely, clear alignment can be seen between the strategic performance measures and the agency's vision. Each employee should understand his role in successfully accomplishing the agency's mission (Braceras 2018).

The Tennessee DOT (TNDOT) uses its strategic planning office to manage the strategic performance management process within the agency. A customer satisfaction survey is conducted on a 3-year cycle to gauge general attitudes toward TNDOT and to use the results to establish emphasis areas over the next few years. Maintaining the infrastructure assets always ranks as one of the highest stakeholder concerns as well as providing improvements in safety. In addition, managing congestion ranks highly as a concern from highway users (ETC Institute 2017). These findings confirmed many of the department's performance metrics were directly relevant to what their customers expected.

Story-Telling

UDOT uses several avenues to push PM information to employees. A podcast series called *Beyond the Barrels* was produced and the UDOT YouTube channel hosts videos used during the legislative session to discuss the goals and initiatives underway at the agency. The Director conducts multiple levels of outreach associated with outlining priorities for different stakeholders and internal staff (Mortenson 2018).

For the NCDOT, developing the maintenance performance measures has enabled the agency to tell part of its story comparing reactive versus proactive maintenance. The agency had claimed in the past that 60–70 percent of its maintenance work had been in reactionary activities or emergency recovery. From tracking relevant performance metrics, the agency could provide documentation to the legislature that showed the trend. Through properly allocating additional funding that came with the *Operations and Maintenance Improvement Plan*, the agency reduced its reactionary activities, and was able to complete more activities consistent with its plan (Norman 2018).

In 2012, approximately one year after becoming the TNDOT Commissioner, Mr. John Schroer established new values for the agency, which defined the expectations for how TNDOT would conduct business. The guiding principles were introduced to staff as an acronym catchphrase: PIERCE, which stood for:

Professional.
Innovative.
Efficient.
Responsible.
Communicate.
Expeditious.

Commissioner Schroer continued to use the guiding principles to illustrate the outcomes he expected, and how customer service would be achieved within the agency. He also encouraged the division directors to carry forward the same message to staff under their management and to hold the same expectations (Linville 2017).

Consistency

Delivering communication in a focused, consistent way also builds new experiences for staff observing changed business practices. Because Commissioner Schroer was providing examples of new guiding principles, he developed his division directors into consistent messengers to communicate the expected culture change. Director Braceras directed UDOT division directors

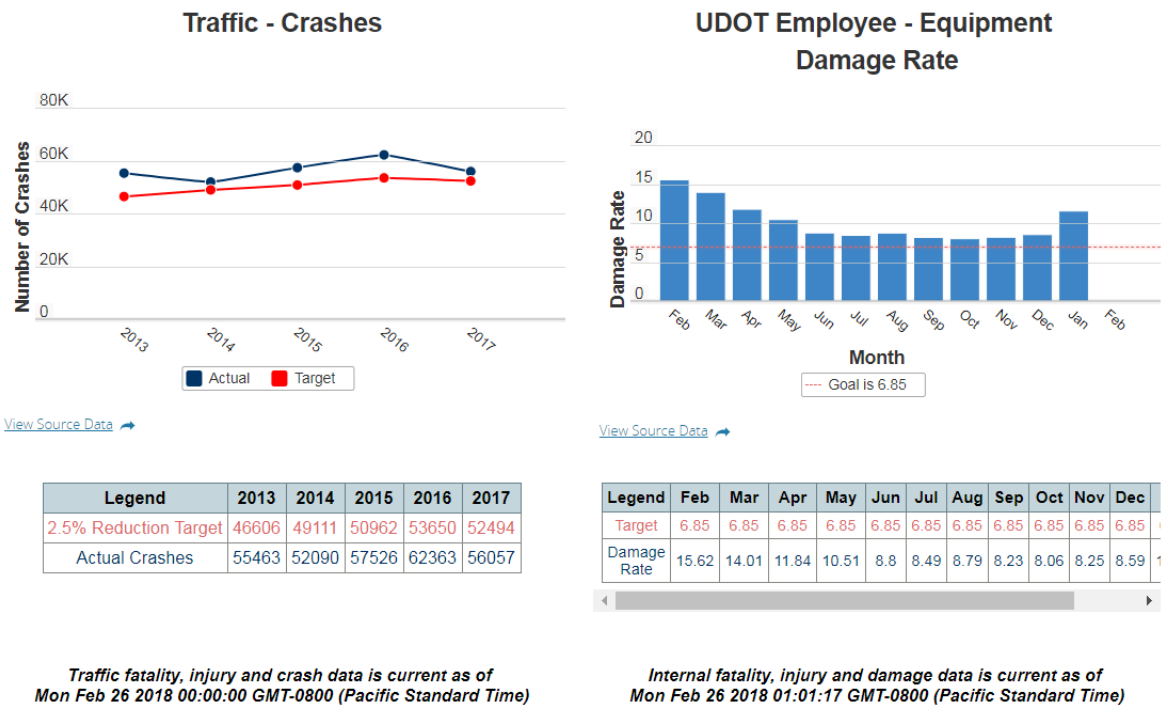
and regional managers to meet with employees at all levels and locations within the organization to discuss the agency's mission and vision for what the agency was to accomplish. The Michigan DOT uses some performance measures that are also used at the state government level by the governor to report progress on performance initiatives. A public-facing dashboard conveys the information consistently for all stakeholders.

With the NCDOT 5-year *Operations and Management Improvement Plan* established, each maintenance shed posted its expected accomplishments on the wall to show planned accomplishments, e.g., how many shoulder miles are pulled or how many feet of cross line pipe are replaced each year. Expectations are established consistently across the State and are available for all the employees to see. By stating its goals up front, the agency has laid the groundwork to answer the question, "why are we doing this?" Other agencies should anticipate the "why" question, and be able to answer it from each employee's perspective (Norman 2018).

For consistency in project selection, the North Carolina State Legislature established the Strategic Transportation Investments law, which requires a scoring process be conducted for all capital projects. These are predominantly projects to address congestion and are non-bridge asset- and non-pavement asset-based projects. Stakeholders (such as the MPO, RPO, or county commissioner boards) are expected to score projects in their respective areas based on pre-defined criteria such as congestion, economic development, or safety. Each body is permitted to develop its own scoring system, but the resulting project scoring must be applied consistently on each project. The scoring process is then data-driven and provides as much transparency as possible in project selection. NCDOT conducts project scoring for the statewide tier of highways, which is made up of the interstate system and the NHS (Norman 2018).

Dashboards

Performance dashboards are used by STA leadership in several states to track both strategic and tactical measures. For example, the UDOT posts its dashboards on its website at https://dashboard.udot.utah.gov/strategic-direction. The UDOT dashboards rely on live data maintained by subject matter experts within each responsible division. The transportation commission and local MPO partners use the dashboards as well for monitoring transportation accomplishments. Figure 4 shows an example of the Utah DOT performance dashboard.



Legend	2013	2014	2015	2016	2017
2.5% Reduction Target	46606	49111	50962	53650	52494
Actual Crashes	55463	52090	57526	62363	56057

Legend	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Target	6.85	6.85	6.85	6.85	6.85	6.85	6.85	6.85	6.85	6.85	6.85
Damage Rate	15.62	14.01	11.84	10.51	8.8	8.49	8.79	8.23	8.06	8.25	8.59

Figure 4. UDOT performance measure dashboard view (UDOT 2018).

The Georgia DOT (GDOT) has been engaged in performance measurement for over 10 years and currently manages around 250 measures department wide. GDOT also uses a dashboard to share strategic level metrics to the target audience including the public, the Legislature, and the State Executive Leadership. Districts and area offices have access through the dashboard to data that they typically do not generate, so that they understand where the information is coming from, and how they can impact the metrics. Metrics are updated monthly, daily, or yearly depending on the connectivity of the data source to the dashboard. Important trends are communicated through emails, regular performance meetings, publications, and/or internal webpages. The measures, their definitions, and their calculation processes are reviewed once per year to determine their relevance and confirm their continued link to the agency mission. Figure 5 provides a view of the GDOT performance measure dashboard. In addition to strategic level measures, GDOT is developing dashboards for tactical level measures used internally by the division offices and regions/districts to conduct their everyday operations.

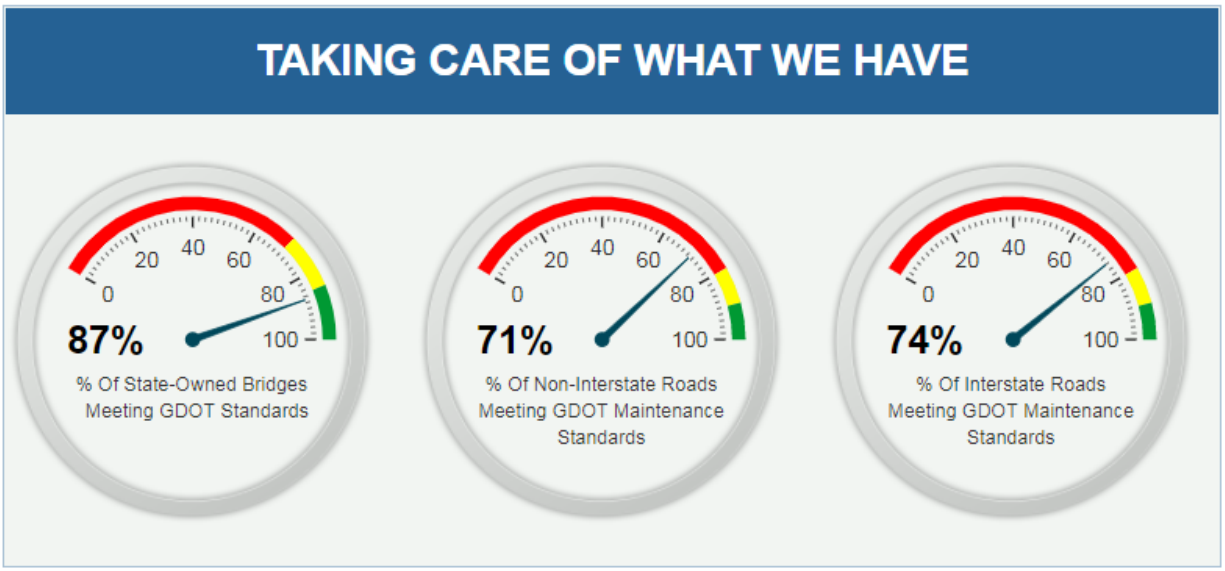


Figure 5. GDOT performance measure dashboard view (GDOT n.d.).

Dashboards are an effective form of communication because relevant results are provided to stakeholders in a simple, easy to understand format. The graphics are easily assimilated by the public without much explanation, and the availability of the information demonstrates agency transparency.

Engaging the Whole Agency

According to Connors and Smith (2011), "Getting everyone aligned around new results does not happen easily. It requires dialogue, engagement, debate, and leadership." Director Braceras agreed that "No one likes being told what to do without having input" (Braceras 2018). Providing opportunities for employees to provide input and listening to concerns were identified multiple times during the interviews as being a key success factor for implementing performance management and having cultural acceptance.

Goal Setting

Director Braceras indicated that the success factors for performance management were less about setting goals and more about making UDOT better. Performance management has been widely used in UDOT since 1994. Currently, the results are evaluated monthly along with a leadership discussion to probe, "what are we going to do to address the results?" Performance management is used internally across the agency to support decisions on budgets and justifications for full-time-equivalent staffing requests for instance. Metrics are incorporated into ongoing business activities, and managers are expected to be using performance projections to bolster their recommendations.

Performance management is used consistently within UDOT to facilitate its business functions. The 91 maintenance stations in the State are expected to be a part of the goal setting process and are asked to provide suggestions for emphasis areas and ideas for how to better meet the agency goals. Involving staff in setting performance goals or deciding how to meet them helps to engage them in the process.

The Utah Governor's office has a continuous improvement initiative, and promotes transparency, consistency, and making informed decisions about funding projects. Informed decisions are data driven, usually through performance metrics. It is important to have data that shows how additional funding benefits program areas, and what performance can be expected if funding is reduced in a program area. "The public wants to see how the money is being used by the agency. Currency is trust, trust is built on transparency. We need to maintain trust" (Braceras 2018).

Norman (2018) reported that in the NCDOT, goal setting is a management function; however, an employee survey is conducted to engage employees and measure job satisfaction.

Relevant Measures

For performance measures to be accepted, they should be relevant to the business done by the organization. Director Braceras developed a top-ten list to communicate UDOT's vision and direction, and relevant performance measures are included with them. Leadership is responsible for explaining why these metrics are important, and how agency strategies are related to the performance metrics (Mortenson 2018).

Performance measures should also be closely linked to the agency's vision, mission, and goals. GDOT reports strategic measures, and additionally, encourages the divisions and areas to use subsets of those measures to manage their respective programs. By providing relevant measures to each office, individuals better understand the relevance of their performance to the agency's success in meeting its performance targets. Individual offices and staff can then see "what the agency goals mean to me" (Mujkanovic 2018).

Performance Reviews

GDOT uses strategic measures for agency wide goals and initiatives, but divisions are encouraged to use sub-measures relating to their contribution to the agency's goal. A success factor for performance management adoption is that the performance management staff conduct a quarterly performance review with each division or office, so that actions can be taken to improve performance or re-evaluate the target. The organization has 7 districts and 32 area offices, using 24 measures that are measured and reported quarterly in each district. These performance review sessions provide an opportunity to add resources, increase intra-office coordination, or re-examine processes to meet the performance target (Mujkanovic 2018). Division Director Carpenter (2018) added that agency executives are often attending these review sessions, which relays the importance that the leadership team places on performance metrics being met or adjustments being made to levels of effort to reach the target.

At GDOT, having performance metrics at a district level encourages managers to share best practices from within the districts. The managers can establish action items or further evaluate the data using smaller-level metrics to get a better picture of what the data actually means. The staff have accepted the performance management approach because upper management has set the tone and established accountability. The organization has seen buy-in at all levels with staff agreeing that this is a positive way to conduct business at GDOT. The process continues to evolve as new initiatives emerge. The GDOT process contributed to the performance management culture through efforts focused on messaging consistency, coordinating initiatives,

promoting internal transparency, and reacting to changing conditions and exposure (Mujkanovic 2018).

Cooperative Efforts

In 2007, TNDOT incorporated performance metrics into employee performance reviews in conjunction with an initiative through the State Department of Human Resources. The initiative was established to develop job performance plans and evaluations for all state agencies based on the SMART concept (Specific, Measurable, Applicable, Relevant, and Time-based) (Poor 2017). With the new job performance plans developed, employees were evaluated with nearly all the proportion for scoring coming from objective measures. While not completely understood by everyone, the process was accepted because the whole state system was being revised to align with the Governor's performance plan. TNDOT had a number of relevant performance measures at the strategic level, but statewide, other agencies did not have data to support the process. In addition, employees were often being evaluated on lag indicators, meaning the employee had little idea of the metric values until after the review cycle was over; or the employee had little control to set budget or work schedule to affect the outcome. To correct these deficiencies, the employee performance review process was revised through several iterations. Currently, TNDOT performance reviews are approximately 50 percent objective measurements, and 50 percent subjective behavioral-based observations. The primary benefit of conducting performance reviews is to provide a process for employee and supervisor engagement (Poor 2017).

Share Values

UDOT uses a "roadmap" to articulate its mission, vision, core values, and strategic goals. Director Braceros indicated that it is important for employees to know how the agency's mission is accomplished. He said, "Our shared values are our culture. I spend my time developing and messaging our strategic goals, while the organization carries them out. UDOT is essentially an engineering company – grounded in data and facts." The Director considers it his role to create an atmosphere with opportunities for people to have meaningful conversations. "As a leader, you want to run, but you have to bring people with you" (Braceras 2018). The Director meets with every group of new employees to articulate the mission of the agency, and explains how they fit into accomplishing that mission. He also makes a concerted effort to reach each employee in their work area locations across Utah. The regional administrators are expected to meet with every maintenance shed crew twice per year to have those employee interactions that support meaningful conversations. "It's about people" (Braceras 2018).

Demonstrative Decision Making

Michigan DOT began asset management in 1997 when the Michigan Transportation Commission adopted pavement condition goals. In 1998, the Commission established bridge condition goals. To accomplish these goals, the Michigan DOT used progressive pavement preservation techniques, with a target of marked improvement in the system within 10 years. Michigan DOT met its goals and continued to use preservation strategies to manage its assets. As they implement the MAP-21 and FAST Act requirements, they find their measures changing to comply with Federal regulations. This has prompted a re-evaluation of their predictive models to gain confidence that the targets can be achieved. In preparing the performance-based work plan, a call for projects is issued to the regional management teams with guidelines for how projects should be evaluated. The regional managers choose their pavement and bridge

preservation projects and their safety projects within the guidelines to meet the performance metrics assigned by the central office. An approval committee at the central office has the authority to approve the project listing. When the goals have not been achieved or the strategies have not been applied appropriately, the committee has declined to accept the list and has asked for a different project list to be submitted. Department leaders have endorsed performance metrics, and performance management is the way business is done.

Accountability

Connors and Smith (2011) stress that personal accountability is the single most important aspect for accelerating a change of culture and in achieving results. "Fundamental to every organizational process and system, accountability defines the foundation of all working relationships. It is the 'nerve center' running through the organization, and it drives the smooth and effective functioning of everything that happens" (Connors and Smith 2011).

Job Performance Plans

Leaders establish links from the agency's vision to measures that represent what the agency is about. Personal performance plans are used to "push down" performance measures as a part of the overall performance evaluation system (Mortenson 2018).

As performance management progressed in the NCDOT to include metrics in employee performance reviews, the process was 100 percent objective data-driven. That process could result in employees being held accountable for conditions outside of their control. As the process evolved, the evaluations became approximately 50 percent data-driven based on performance metrics and 50 percent based on observational behaviors. The system is consistent for crew level employees throughout the agency to supervisors, managers, and executives. Each employee's performance also includes a workplace safety component. A factor that led to their performance management culture being successful was the process flexibility and being understanding and responsive to employees, enabling the agency to "adapt over time" (Norman 2018).

GDOT's goals are included for maintenance foreman and their workers, but are similar for agency executives and managers. Some performance measures are "harder to swallow than others" (Carpenter 2018). Areas like traffic operations or highway fatalities are more difficult to relate to personal responsibility because they are affected by so many variables seemingly outside the realm of control for designers, law enforcement, and TMC operators. Annual performance reviews are conducted with each employee and a portion of the scoring criteria is linked to their business unit's performance metrics. The team leaders' ratings build from their staff metrics, which build upward into the agency executives' performance reviews. So, the entire organization is involved in meeting performance metrics (Carpenter 2018).

Performance Goals

To achieve accountability, SMART performance goals are assigned to each person. In GDOT, personal performance plans are used to establish personal accountability in strategic areas and the agency performance measures are a component in each employee's performance plan. Business units within the agency are encouraged to develop sub-measures to create a better link to the work performed. This is done to establish a more relevant link to the business and to apply accountability standards that are most relevant to achieving the agency metric.

Division Business Plans

Documenting how divisions contribute to an agency's goals is a necessary part of business management. Along with documenting their purpose, many business units use sub-measures for accountability where the overall measure may be shared among several business units. For instance, roadway design, right-of-way acquisition, environmental permit development, and structural design all share a part of implementing project development; however, accountability for the entire process may only come together at the Deputy Director or NDOT Director role. To aid in analysis and gaining ownership of the issue, fatalities may be broken down by geographic areas coinciding with areas managed by different regional administrators.

The Tennessee DOT began its strategic planning process in the 1990s in an effort to communicate the agency's mission, vision, values, and goals internally to agency staff and to the public. Over the next decade, the process evolved from using multidisciplinary teams focused on a specific goal, to a performance-oriented planning process using performance measures. A business planning process was introduced so that each division created a tactical business plan, and as part of the plan, each division used similar metrics to those chosen by the agency as strategic performance measures. This alignment with departmental strategic goals, caused division business plans to feed directly upward into the agency leader's performance plan. Therefore, each division director had individual performance plan goals that directly fed into the agency's performance plan. In that regard, each departmental strategic goal was identified or owned within a single division or within multiple geographical regional offices. Each year as part of the performance assessment process for employees, the relevant performance metrics were reviewed, and each employee was assessed according to progress reaching the target. New performance measures had to be created in some cases to facilitate the new evaluation process, and targets selected without significant history or prior management experience using the metrics required adjustment in subsequent years. However, even though it was an iterative process over several years, business planning at the division and unit level provided engagement and accountability for division staff (Linville 2017).

Executive Buy-In

The most important factor for GDOT performance management is the support of agency leadership, which supports accomplishing established goals. GDOT leadership participates in metric review meetings and are able to assist if additional resources and initiatives need to be assigned (Mujkanovic 2018). Performance management is fully integrated within the agency. Strategic performance measures are reviewed quarterly with the Commissioner, Deputy Commissioner, Chief Engineer, and Treasurer so that changes can be directed, if required. Performance measures are used to guide the discussion, and to adjust priorities in a cooperative and collaborative way (Carpenter 2018).

At UDOT, performance management is prioritized by the Director. He recently devoted his keynote address at the state transportation conference to agency performance and the agency's vision for the next several years, emphasizing the importance he places on this message (Mortenson 2018).

Decisions Made Based on Metrics

The NCDOT manages one of the largest state-maintained roadway networks in the U.S. and has a well-established asset management program for pavements and maintenance. NCDOT began an *Operations and Maintenance Improvement Plan* to raise the level of service across all roadway functional classes. From a maintenance perspective, the *Plan* establishes a 5-year work priority. That enables the agency to plan for and communicate how much work will be accomplished over the plan horizon. The *Plan* includes 12 activities with goals established based on budget and life cycle of the assets involved.

The *Plan* metrics are reviewed each quarter to evaluate results, budgets, and inventory. Managers initially struggled to understand how they could be successful in achieving the targets, but their sense of ownership grew for the assets, and it promoted a higher engagement in verifying that the inventory data was correct, and the targets were assigned appropriately. The main goal for developing the targets was for the maintenance leaders to have a plan, execute the work, and be accountable for the results (Norman 2018).

Strategic Adjustment

Performance management is fully integrated within GDOT. Even in a well-established program, periodic adjustments are necessary to fully represent the agency's vision. Visions shift and regulations change. All of these factors have to be taken into consideration when managing an organization. It is important for agency leaders to properly evaluate the management climate, to assess the strengths and weaknesses of a program, and to adjust it appropriately. Performance measures are used to guide the discussion and to adjust priorities in a cooperative and collaborative way (Carpenter 2018).

Summary

Agencies that have successfully adopted a performance management culture have found that when employees find "what's in it for me," they are more likely to accept organizational change. These STAs have empowered employees to modify their metrics to be more meaningful to their business activities. These efforts have enabled the process to move beyond "low hanging fruit" to incorporate more communication between offices and silos, fostering teamwork. Other success factors suggested by these agencies include documenting the process, defining the data sources and relevance for each performance measure, and developing an internal dashboard for each office (Mujkanovic 2018).

CHAPTER 5: EXECUTIVE WORKSHOP SUMMARY

Background

To inform, train, and gain feedback from NDOT's executive leadership and other stakeholders, a 1.5-day performance management workshop was held on August 16-17, 2017. The session was held in conjunction with a FHWA TPM workshop and included several presentations and breakout group activities. An overview of the FHWA's TPM Toolbox (discussed in chapter 2) kicked off the workshop, the TPM framework was introduced (see figure 6) and two components selected by NDOT, Organization/Culture and Target Setting, were presented in detail.

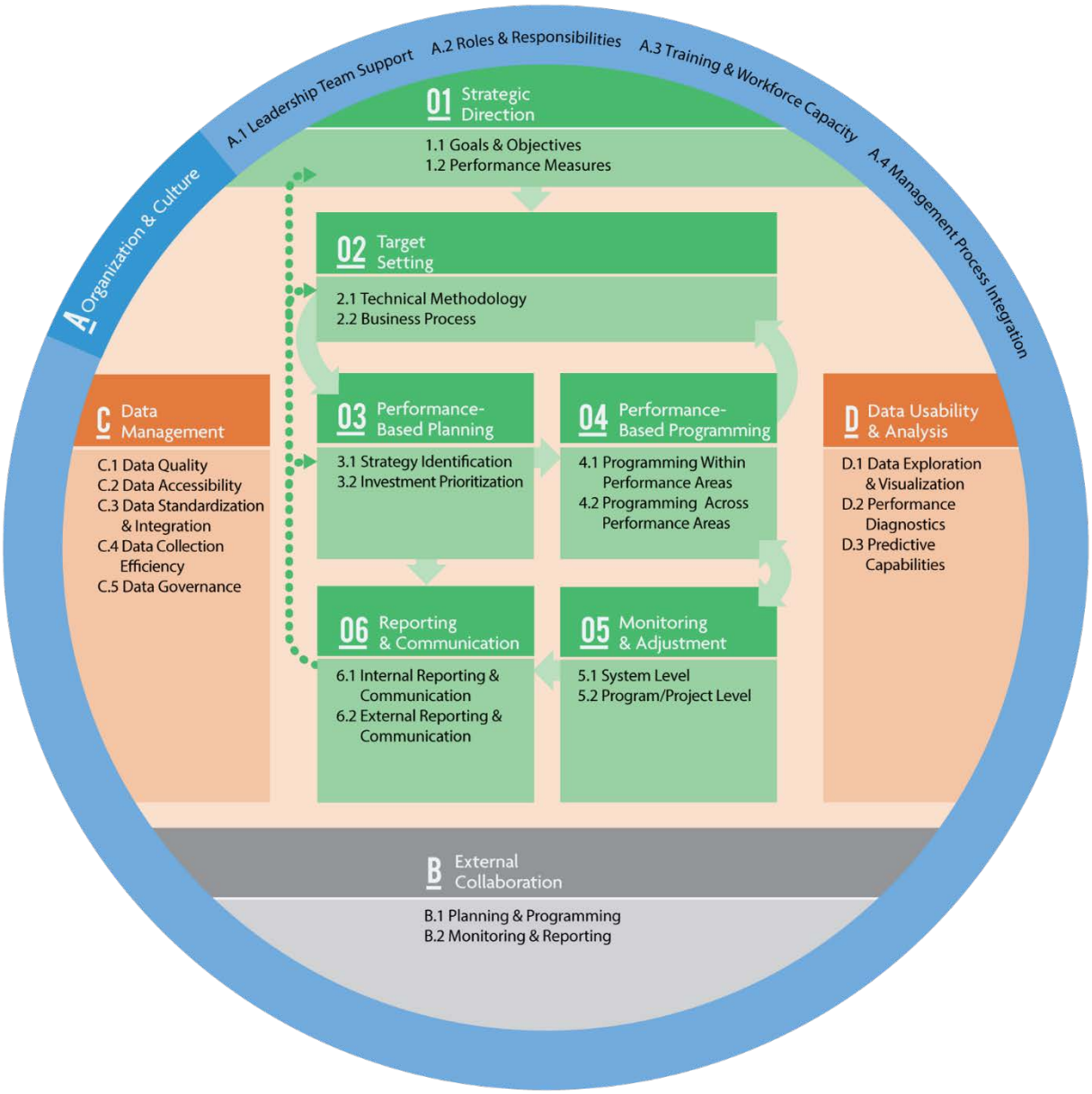


Figure 6. FHWA TPM framework (FHWA TPM Toolbox 2017).

Component A (Organization and Culture) in the TPM Framework is comprised of four subcategories (leadership team support, roles and responsibilities, training and workforce

capacity, and management process integration) and is defined by the FHWA as: "*institutionalization of a transportation performance management culture within the organization, as evidenced by leadership support, employee buy-in, and embedded organizational structures and processes that support transportation performance management*". (FHWA TPM Toolbox 2017). This component allows for integration of strategic goals and performance into every part of the agency, including employee management. Significant benefits to implementing this component include fewer silos resulting in more cohesive work, leadership justification of activities through performance data, transparency and accountability from policymakers, greater efficiency, and reduced costs. (FHWA TPM Toolbox 2017). FHWA has observed that successfully implementing TPM depends to a large extent on organization and culture.

Component 2 (Target Setting) in the TPM Framework includes two subcategories (technical methodology and business process) and is defined by the FHWA as: "*the use of baseline data, information on possible strategies, resource constraints and forecasting tools to collaboratively establish a quantifiable level of performance the agency wants to achieve within a specific timeframe*" (FHWA TPM Toolbox 2017). This component links investments to expected performance and is interconnected with all elements of TPM. Requirements to achieve targets include quality data, good analyses, and solid business processes (FHWA TPM Toolbox 2017). Target setting supports TPM by asking the proper questions in the areas of planning, analysis, programming, implementation, and evaluation, as well as communicating the level of service the agency desires to achieve.

Prior to the workshop, the participants were encouraged to conduct an assessment by comparing NDOT's processes to achievement levels provided in the FHWA TPM tool. The assessment tool is called the capability maturity model (CMM), and it describes benchmark TPM achievements that agencies with advancing performance management practices typically demonstrate. The implementation process recommended by the FHWA and shown in figure 7 was explained as a preface to the agencies' assessment results.

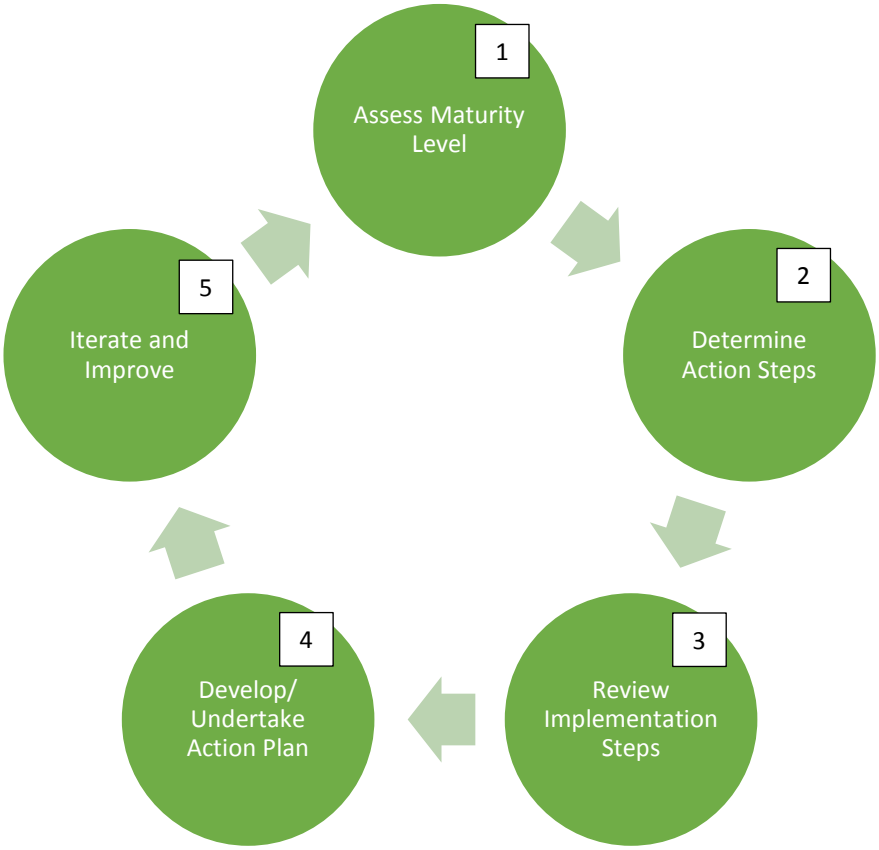


Figure 7. FHWA TPM implementation process (FHWA 2017b).

The TPM implementation process allows for an agency to continuously and cyclically assess itself. Each of the five steps must be done in an honest and straightforward way in order to obtain trustworthy results (FHWA 2017b). The procedure description is detailed below.

- Assess maturity level.
  - Complete a self-assessment that provides:
    - Maturity level.
    - Actions to advance.
    - Links to TPM guidebook implementation steps.
- Determine action steps.
  - Use CMM levels of maturity (see table 2).
  - Consider the agency's context.
  - Draft the action items specific to the agency's needs.
- Review implementation steps.
  - Follow the steps underlined in the TPM Guidebook (FHWA TPM Toolbox 2017).
- Develop/undertake action plan.
  - Work with internal staff and external partners.

  - Build consensus around priorities.
  - Establish measures of success.
  - Implement the action plan.
- Iterate and improve.
  - Re-assess the agency maturity trough self-assessment.
  - Repeat the process to continually improve.

Table 2. TPM CMM levels of maturity (FHWA 2017b).

Level	Definition
1. Initial	Ad hoc, uncoordinated, firefighting, champion-dependent.
2. Developing	Nominal framework (e.g., organizational roles) being defined and systematic approaches starting to emerge.
3. Defined	Framework and systems defined but not fully implemented or effectively supporting decision making.
4. Functioning	TPM practices have been institutionalized, information used to guide actions, data improvements being pursued, basic predictive and tradeoff capabilities in place.
5. Sustained	TPM will survive across new leadership, managers using performance information, data effectively managed, and external stakeholders view performance results as useful in promoting accountability and transparency.

TPM maturity depends directly on staffing and resources. For instance, a department may only be able to reach a maturity level of three due to certain characteristics; however, department personnel can aspire to reach a maturity level of four or five and set goals and targets to move towards that level of maturity. Achieving the higher maturity level may require additional staffing or resources.

Self-Assessment Results

Participants were then introduced to the results determined from both NDOT and MPO/RTC pre-workshop assessments. The scores for both Target Setting (column 1-6) and Organization/Culture (column A-D) are shown in figures 8 and 9. Overall, the assessment results resonated with participants. However, it was surprising to some that the score for performance-based programming was below their expectations. Many of them considered performance-based planning to be a strong component within their agencies' processes. Others mentioned that data collection is readily available, however, the ability to convert that data into usable information is certainly an area for improvement.

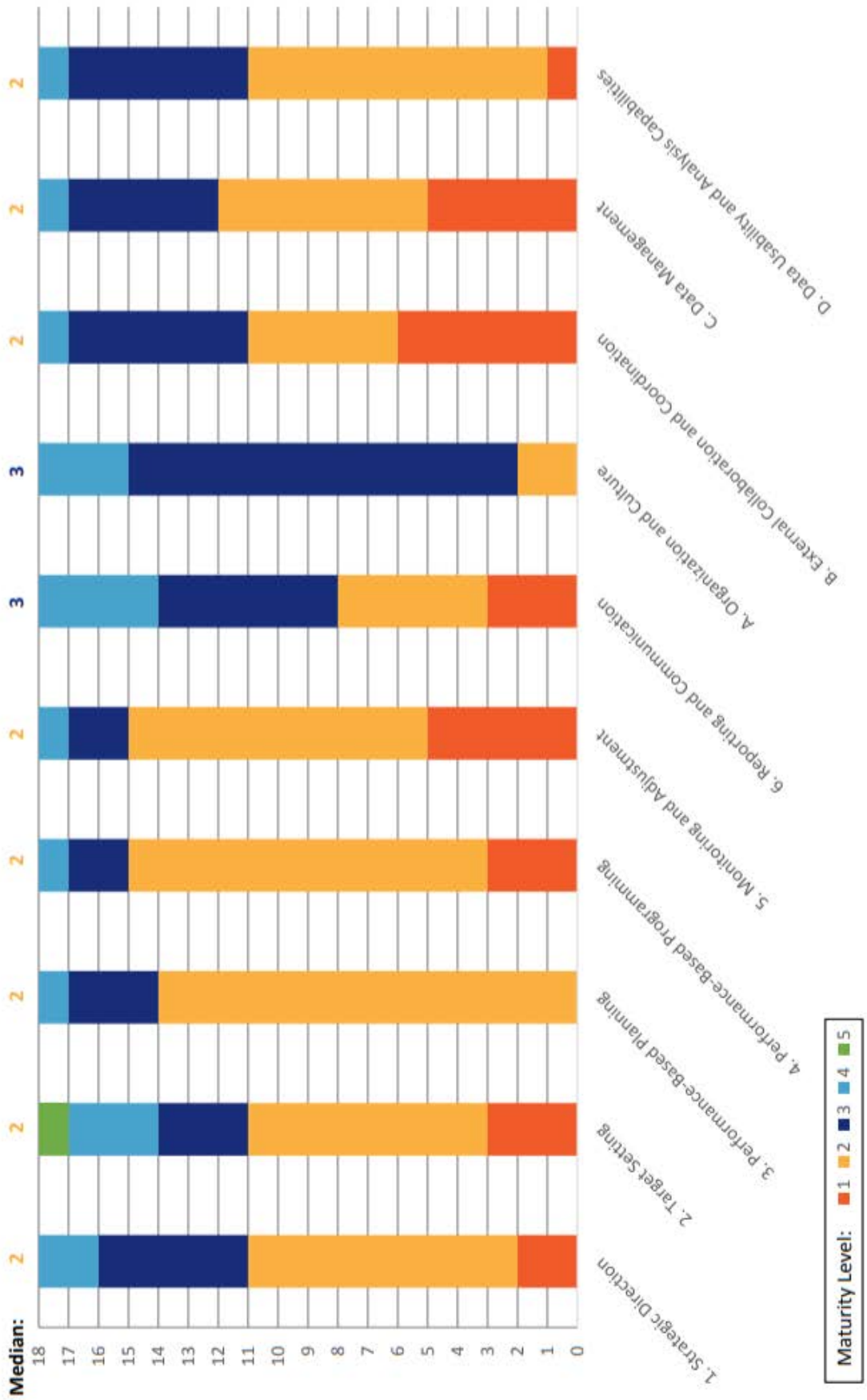


Figure 8. NDOT assessment results by component (FHWA 2017b).

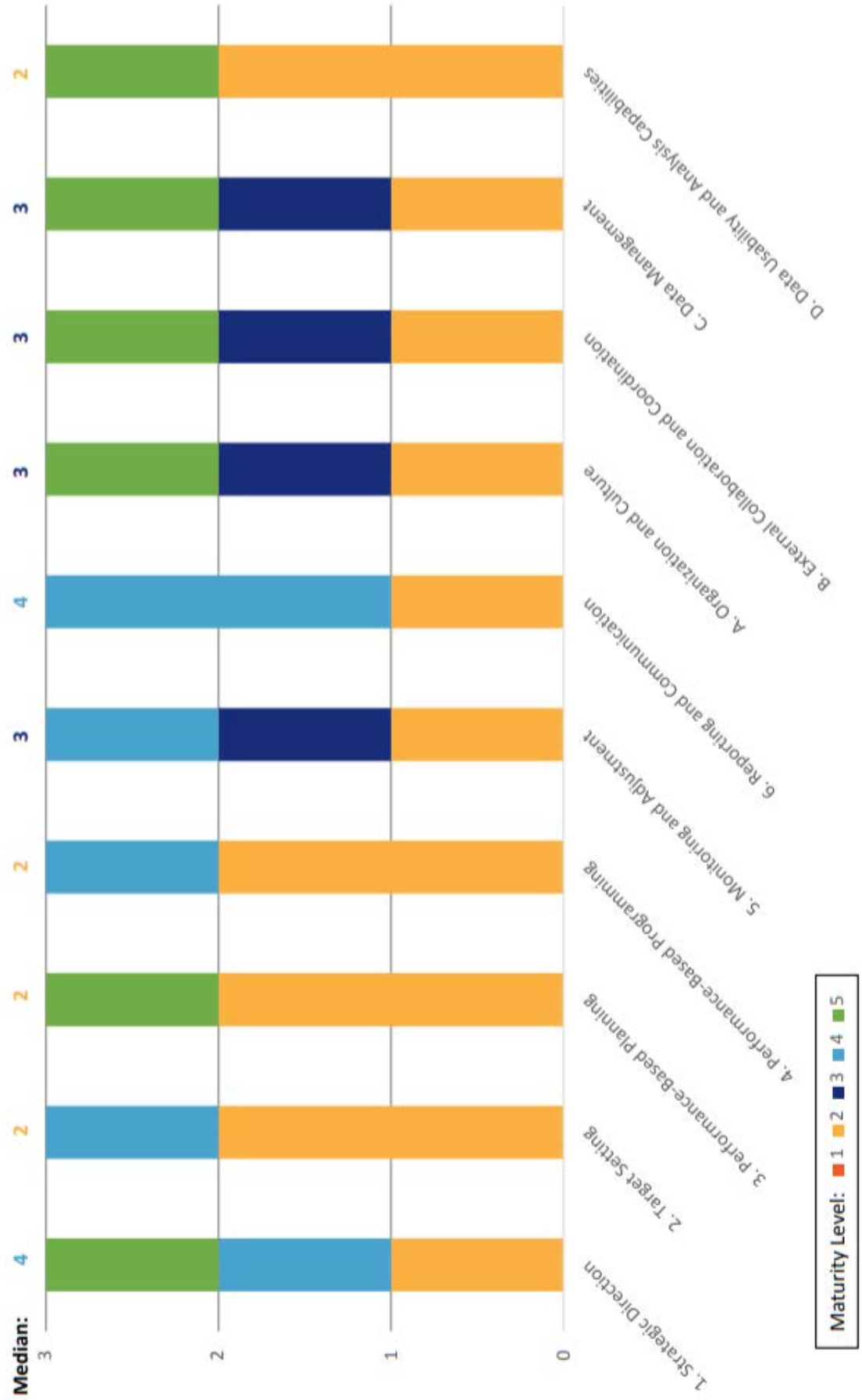


Figure 9. MPOs and RTCs assessment results by component (FHWA 2017b).

In order to prepare the audience, NDOT's approach to TPM was described by Ms. Sondra Rosenberg. She summarized NDOT's performance management process and the agency's TPM priorities. For instance, several divisions were involved in developing the TAMP to ensure asset management permeates throughout the agency, and Nevada was the first state to have its freight plan approved by the USDOT. Since the agency seeks to continually improve, a dialogue took place regarding how to align with the new FHWA requirements as well as allowing for flexibility when setting targets.

Cultural Factors Affecting TPM

Cultural improvements for PM at NDOT were also discussed at the workshop. The Principal Investigator for this study shared preliminary findings with the participants to encourage their implementation of best practices from other State DOTs that have adopted performance management. NDOT's strengths and areas for improvement were identified during prior tasks by the research team and are included in table 3. Each topic was discussed during the workshop to provide specific observations and to receive feedback from the participants. The workshop also included the FHWA TPM cultural factors that allow PM improvement through leadership team support, designated PM roles and responsibilities, focused PM training and workforce capacity efforts, and an integrated management process.

Table 3. NDOT strengths and areas for improvement.

Strengths	**Areas for Improvement**
Executive buy-in	Accountability
TPM reporting history	TPM system dashboard
Vision-related measures	Employee engagement
Collaboration with MPO partners	Broad measures are difficult to own by a division
Management using TPM via goal setting and periodic adjustment.	Internal communication with others outside of immediate group
	Transparency in decision making

Recommendations to improve in these areas included connecting performance measures to employee performance plans, engaging the employees in goal and objectives setting, establishing dynamic measures to support agency objectives, and utilizing common data sources to avoid discrepancies in the results.

Group Breakout Sessions

After the cultural factors were presented, the participants were organized into six mixed groups and were asked to discuss what they had heard and identify issues that resonated with the group members. The breakout activities consisted of six groups of three to seven individuals from different agencies. The breakout activities addressed Component A (Organization and Culture) and Component 2 (Target Setting) from the TPM framework. Maturity levels were re-established by the groups, and action items and priorities were outlined that would permit achieving higher maturity levels for each component.

In summary, the recommendations developed by both participants and presenters included:

- Address the lack of resources and staffing. However, the group recognized that staff should not use resource issues as an excuse when targets aren't met.
- Use measures to improve the agency, not punish. Participants indicated that performance targets should not force competition between divisions. Rather, they should foster interdivisional cooperation and compromise when budgets are tight. Each employee's roles and responsibilities are not clear enough. There were multiple mentions that employees do not know how they fit into the performance measure culture, or how they are able to help their division meet the performance targets.
- Clarify goals and targets at all levels in NDOT. Communication and coordination must be improved at the division and interdivision level.
- Recognize that NDOT has many people retiring, which will likely lead to a loss of knowledge and an inability to transfer the knowledge to newcomers. Staffing adjustments need to be made and new hires must know the performance measures and what his or her role is within the agency.
- Emphasize the importance of staff evaluations so they become a habit, with everyone being evaluated held accountable for their performance. This will generate a changed mindset in employees that fosters embracing the agency's direction and becoming goal driven.
- Increase and improve training. This was suggested due to constant and continuous questions from staff about goals and how they can aid in reaching them.
- Define and communicate NDOT's direction to all of the employees. Confusion regarding this subject still exists within divisions.
- Identify and address problems that need solutions. This suggestion could be addressed by assigning staff to solve problems, documenting the processes, and using the information to facilitate change.

CHAPTER 6: FINDINGS AND RECOMMENDATIONS

Background

Through the conduct of this project, NDOT has provided the research team with unrestricted access to the agency's management and business practices. As a result, the research team was able to objectively consider the information obtained from the executive and management team interviews, and identify lessons learned from other DOTs that might be applicable to improve NDOT's performance management culture. In concluding the project, these findings and recommendations are intended to strengthen performance management principles at NDOT and to realize the benefits of TPM by enhancing existing business practices. An implementation plan is also provided as a structure for implementing the project recommendations.

Communications

Increasing agency acceptance of performance management requires persistent messaging on the part of the agency communications staff, executives, and division managers. Every team lead within the agency needs to be purposeful in delivering the message to staff and to stakeholders that "NDOT uses performance measures to do business." Performance measures must also provide meaningful context for story telling within the agency.

Executive Endorsement

NDOT has used performance measures for several years. The measures were created to comply with AB 595 and have evolved through several iterations of its processes. Collaboration has led to the creation of additional measures to accompany the FHWA Stewardship and Oversight agreement. The agency executives, including Director Malfabon and Assistant Directors Hoffman and Rosenberg, have fully endorsed the performance management process, and with this level of endorsement from Nevada executives, and robust stakeholders input, the measures relate well to the mission, vision, and objectives of NDOT.

Alignment with the Statewide Vision

NDOT's performance measures also align with the Governor's vision and performance plan. This is clearly documented in the *One Nevada Transportation Plan*. The Plan documents the agency's approach to meeting the citizenry expectations and objectives using the performance management structure.

Strategic Messaging

It was apparent during both the executive interviews and the workshop that performance measures are not well communicated throughout all levels of the agency. Other SHA best practices promote achieving awareness at all levels of the agency. Boots-on-the-ground staff from districts and regions were inconsistent in their ability to explain their performance management roles and responsibilities.

Recommendations to Improve Communications

To improve communications, NDOT can:

- **Conduct training.** Design and deliver training for staff on their performance management roles and responsibilities.
- **Deliver targeted internal communications.** Task the Communications Division, PAD, and division leadership with developing targeted internal communications to NDOT staff. Communications explain the purpose, goals, benefits, and implementation of performance management. They also explain the performance management roles and responsibilities assigned to each stakeholder. Use PAD to assure that the communications are consistent with NDOT's strategic direction and division leadership to clarify how each division contributes to the agency mission.
- **Develop a performance management dashboard interface**. Dashboards make it easy for stakeholders to monitor the agency's performance. Promote transparency and trust by developing a dashboard that is easy to access and navigate.
- **Distribute regular progress reports.** Regularly distribute the Transportation Board's statements of accomplishment to staff to demonstrate how business is done within the agency. Recognize successes that are achieved throughout the implementation process to emphasize the benefits to the agency and stakeholders.

Engagement

Advancing a performance management culture at NDOT requires widespread support for change. Obtaining widespread support requires stakeholders to have a clear vision of their roles and responsibilities. Basically, the employees need to know "what's in it for me?" Through meaningful conversations, these questions get answered.

Maintaining Strategic Partnerships

NDOT has initiated unique strategic partnerships that enhance its use of performance measures. One example of this is the partnership with the statewide MPOs. This partnership encourages MPOs to establish similar performance goals and targets for the TAMP and that comply with federal regulations. NDOT has used its role within the Executive Safety Committee for Transportation to affirm its statewide initiatives to enhance traffic safety.

Personalized Agency Roles

NDOT employees need to understand where they fit into the agency mission and objectives, and believe that they can personally contribute to meeting those. Multiple sources presented examples of engaged employees as contiributing with a personal commitment to agency goals. Whether it was maintenance employees accomplishing their required retrenched ditches and culvert replacements or a communications office exceeding expectations for public outreach, employees need to be personally involved in departmental achievements.

Recommendations to Improve Engagement

To increase improve engagement, NDOT can:

- **Describe performance measures in terms relevant to stakeholders.** Instruct each office to describe its business function in the organizational structure and how achieving their performance goals contributes to the agency's success.

- **Verify the relevancy of performance measures.** Establish a schedule to review strategic performance measures and verify that each one is relevant to the agency's mission, vision, and objectives. This may involve a discussion with each division head to review tactical business plans and verify they align with the agency's performance management goals. Include in the review verification that the Transportation Board's and Director's initiatives are fully adopted. This can be accomplished by monitoring tactical performance planning and measures.
- **Regularly request feedback and report on implementation progress.** Request feedback on the implementation from all stakeholders. Feedback might be obtained through a survey or by hosting a roundtable discussion. Meaningful opportunities to share successes, concerns, and perspectives stakeholders can garner important data and indicate where changes may be required in order for the overall implementation to be a success.
- **Revise business planning processes.** Establish links from tactical divisions to the strategic vision by implementing a formal business planning process. The process can include subdividing measures to determine what might be most applicable to operational divisions, and analyzing performance measurement data to create tactical and strategic initiatives for the agency. Task the PAD with developing guidance that permits revising the performance metrics allowing them to mirror priorities and processes inside agency divisions.

Accountability

Accountablity is a key component of performance management. Executive leadership are accountable to the legislature and other external stakeholders. Leadership are responsible for ensuring the successful implementation of the program throughout the agency and achievement of the agency's strategic goals. Department heads and managers are accountable to executive leadership. They are responsible for meeting performance targets and using data to support resource recommendations and requests. The entire agency is accountable to the public as stewards of public funds and safety.

Cross-Asset Optimization

Cross-asset optimization tools and strategic goals are used to achieve desirable results in infrastructure condition, economic development, and fatality reduction. Optimization using weighting factors in alignment with agnecy priorities promotes transparency in project selection, and maximizes the benefits for programs delivered with available funding. NCDOT showed statewide maintenance performance measures implemented in a strategic maintenance activity focus. Safety projects may be prioritized using crash reduction factors compared to cost.

Employee Performance Evaluations

NDOT staff consistently placed responsibilty for meeting performance expectations on the Director. However, opinions varied regarding how much responsibility was shared with other agency executives and managers. Other SHAs have implemented employee performance reviews that assign some responsibility for meeting strategic performance objectives to division managers and unit employees whose work can directly impact the measures. The process for reviewing performance is not meant to be punitive, but to provide personal motivation to employees to own their work.

Recommendations to Improve Accountability

To increase accountability for performance measures, NDOT can:

- **Continue performance-based programming and project selection using tradeoff analysis optimization tools.** Share project selection process with agency staff and the public as the process is refined. Transparency in funding choices shows the agency is making difficult trade-off decisions, but is ultimately adhering to stated priorities and metrics linked to the vision.
- **Implement performance-based employee reviews.** Using each business plan's measures, work with the Human Resources Division to develop job performance plans that align with agency performance metrics. Make supervisors and managers accountable for their business units, requiring budgets, resources, and schedules to be managed to achieve results. This makes achieving performance targets a matter of personal responsibility. Train supervisors on the new process and communicate to staff the implications of a performance-based evaluation in terms of professional development, promotion, and pay.
- **Develop business plans for each division**. Document the critical roles played by each division in the business plan, as well as performance indicators. Establish division goals that can be used to evaluate success in achieving agency performance targets.
- **Encourage employees to establish goals for their area and sub-measures.** Encourage divisions, offices, and units within the agency to utilize sub-measures to manage daily business operations if a strategic goal is not relevant.
- **Foster coordination between divisions for performance measures with executive ownership.** Broad measures with multiple divisions involved in meeting the performance target promotes a sense that the measure is not owned by anyone. Teams should be formed with an executive team lead that can bring the required focus to the divisions that contribute work products leading to the target being achieved. Sub-measures should be used to gauge each division's contribution toward the target, and included in its division business plan.
- **Demonstrate that decisions are made based on performance measures**. Share examples of NDOT collaborating in facility maintenance and project development to achieve performance results. Use these and other examples to demonstrate that NDOT does business to achieve results in alignment with agency performance goals.

Implementation Plan

Month 1

2. Gain executive endorsement of the recommendations included in this report. The PAD refines the plan to confirm priorities.
    - Establish a framework for quality control and modifications to the performance management initiatives as changes within PM process is updated.

Months 2-4

3. Communicate the need to implement business planning.
   - Establish a policy statement for business planning for the agency. Define why business planning is needed and how implementing business planning can improve operational efficiency and alignment with strategic objectives.
   - Conduct business planning training for agency executives and managers.
   - Communicate the schedule for the annual or biennial business planning cycle.

Months 5-8

4. Develop business plans for NDOT divisions and regions; suggested business planning model is available upon request.
   - List the core business functions of the division.
   - List the agency strategic objectives, measures, and reports that the division contributes to.
   - Identify performance measures or sub-measures that the division is responsible for that pertain to business conducted and align with agency strategic measures.
   - Develop performance goals for the planning cycle for each discrete business unit within the division.
   - Establish the annual or biennial business planning cycle, with incremental updates at least every 6 months.
   - Conduct monthly business planning and performance measure review meetings with each division and the executive leader that oversees the division.

Months 9-12

5. Implement business planning process for NDOT divisions and regions.

Months 13-15

6. Implement performance measures into employee performance plans.
   - Develop a partnership with the Human Resources Division to implement some performance measure standards.
   - Train supervisors on the new process.
     - SMART – Specific, Measurable, Achievable, Relevant, and Time-based.
     - Goal setting – Relate business functions to performance measures. Are they directly applicable to the employee's responsibilities?
     - Set targets – establish achievable targets for the employee goal.
     - Demonstrate example job planning discussions using performance measures.

Conclusion

Transportation agencies nationwide have adopted performance management to demonstrate transparency and accountability to the public, elected officials, and internal/external stakeholders. NDOT identified flaws in its performance management program, recognizing that

performance management is more powerful when used for more than reporting results. Many successful agencies have used performance management to influence both investment and policy decisions. This research effort assessed the use of performance measurement, monitoring, and reporting within NDOT to provide tools that can affect agency culture at all levels within the business units.

Limited research related to cultural impacts of using performance measures in SHAs had been previously published, but several sources identified some of the parameters where agencies have used performance management in communicating with stakeholders and managing processes within the agency. In addition, any successful uses of performance measures were documented from interviews conducted with NDOT agency executives and managers. Using performance measures in employee evaluations was identified in the Communications Division, and some managers stated that they were using sub-measures and data collected for performance measures to manage some business processes internally. Success factors for implementing performance management were documented from interviews with other SHA officials. Their lessons learned include communicating with stakeholders, engaging staff at all levels within the agency, and assigning accountability for performance results. These topics were presented to NDOT managers in conjunction with an FHWA-sponsored TPM workshop.

The TPM workshop, conducted in August 2017, was successful in multiple ways. For instance, it helped generate cultural awareness of the TPM program among NDOT employees and informed participants of best practices from other states. Pre-assessment questionnaire results provided a participant-driven evaluation for determining process strengths and suggested improvement areas. NDOT agency managers, along with MPO stakeholders, were broken into groups to establish priorities that would enable NDOT to improve the cultural acceptance of performance management. The workshop break-out groups also discussed the importance of setting achievable goals and the responsibility to meet agency targets.

In conclusion, the action items were assembled into recommendations that can guide the steps taken by the PAD to improve NDOT's use of performance management. Initial priorities have been recommended for conducting a formal business planning process for the NDOT divisions and regions and modifying the employee evaluation process within the agency to include strategic and tactical performance measures. Implementing these changes reinforces a new way to do business within the agency using performance management transparently to maintain the public's trust and ensure alignment with the agency vision.

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APPENDIX A: NDOT EXECUTIVE INTERVIEW PARTICIPANTS

Table A-1 lists the NDOT staff who agreed to be interviewed for this project. Additionally, a staff member from FHWA and four staff from two MPO partners agreed to also discuss NDOT's current performance management practices.

Table A1. Current practice interview participants.

NDOT Staff	Executive Role
Rudy Malfabon	Director
John Terry	Assistant Director - Engineering
Robert Nellis	Assistant Director - Administration
Sondra Rosenberg	Assistant Director - Planning
Reid Kaiser	Assistant Director - Operations
Sean Sever	Communications Director
Sharon Foerschler	Chief Construction Engineer
Allison Wall	Human Resources Manager
Jessen Mortensen	Chief Bridge Engineer
Paul Frost	Chief of Roadway Design
Ken Mammen	Chief Traffic Safety Engineer
Denise Inda	Chief Traffic Operations Engineer
FHWA Staff	
Paul Schneider	Assistant Division Administrator
MPO Partners	
Patrick Pittenger	Carson City MPO
Nick Goering	Carson City MPO
Lucia Mulroney	Tahoe Regional Planning Agency
Karen Fink	Tahoe Regional Planning Agency

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