



ORGANIZATIONAL SUPPORT FOR PERFORMANCE MANAGEMENT

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Successful performance management serves as an objective, stabilizing force as state departments of transportation (DOTs) balance public needs and budgetary limitations to achieve optimal results with taxpayer dollars. State DOTs face a challenge, common to many organizations, of trying to provide greater results with budgets that are not growing in proportion to increased needs.

To prioritize projects and spending, many factors must be balanced—for example, input from elected officials, who provide guidance on behalf of the public; organizational challenges; and limited funding. Without technical data and the principles of performance management, the decision-making process easily can skew toward one of these factors, potentially undermining the goal—to make better decisions about how to spend the public’s money in providing the best possible results for every dollar spent.

Informing and Improving

Performance management practices help state DOTs not only to achieve the goal of spending public funds effectively but to communicate the reasons for investment decisions and to demonstrate actual or projected outcomes to the public and elected officials. In Utah, elected officials appreciate Utah DOT’s help in informing and improving decisions. In addition to helping the public and elected officials understand the outcomes achieved with the funding available, performance management offers the critical benefit of trust that the money is being spent in the best possible way.

In the long term, performance management creates an environment in which adequate funding is more likely; achieving adequate, not excessive, funding is the ideal scenario. For a state agency, having enough money to do everything on the agenda can lead to bad decisions and consequently to a decline



Photo: Utah DOT

New signal performance metrics allowed Utah DOT to improve the signal operations along Foothill Drive in Salt Lake City.

in public confidence. State DOTs need to face the difficult decisions of how best to use limited funds to achieve the best results; performance management offers the best approach.

Performance management ensures an environment in which leaders can align an organization effectively and direct all levels of the department in understanding and carrying out the daily activities important to customers. An organization that does not adequately communicate its strategic goals to employees on the front lines has failed to complete its mission. A strong performance management environment allows employees at every level to make choices, take actions, and measure results in accordance with defined strategic goals.

Building the Foundation

Utah DOT historically had prepared for moving into performance management, especially in the areas that have become strategic goals. Building a successful performance management program requires cultural and structural foundations within the organization.

Utah DOT's culture of performance management began many years ago and was exemplified in a 1977 study, *Good Roads Cost Less*, by the agency's then-director of research. The study expressed the philosophy that the transportation system is better served through the regular application of cost-effective preservation treatments than by periodically implementing costly reconstruction. The *Good Roads Cost Less* doctrine has echoed for decades throughout the department and remains a guiding principle for every employee, including the technicians responsible for daily activities on roadways.

In the late 1990s, Utah DOT had an opportunity to formalize and develop performance management practices in reconstructing Interstate 15 (I-15) for the 2002 Winter Olympics. Legislative bonding of more than \$1.5 billion allowed the department to reconstruct 17 miles of I-15 in Salt Lake Valley in four years.

A key provision in the legislation granting the funds for construction was that Utah DOT develop an asset management program. Instead of approaching this as a check-the-box requirement, Utah DOT dedicated resources to build performance management practices into an integral part of operations and decision making.

The first asset management plan, written in 2003, included a so-called gap analysis and an implementation plan. Utah DOT recognized the need to develop a vision, strategic direction, asset inventory, optimization strategies, individual performance goals, and performance tracking. These elements are

interdependent, but Utah DOT initially did not have all of them in place; the eventual efforts to implement all, however, have produced an environment of innovation and have developed a culture dedicated to public transparency and accountability.

Practical Integration

Utah DOT's performance management is critical for intelligent decision making about investments and for managing the state's transportation system. By providing a unified vision and direction for the agency, performance management has been integrated into decision making, funding, and project selection, as well as into performance plans throughout the organization.

In the past two decades, the department has pursued a simple but clear mission: to optimize resources with performance-based measures to ensure a safe, well-maintained, free-flowing transportation system. This mission has developed four goals that define the strategic direction and are updated and detailed each year in *Strategic Direction and Performance Measures*. The document articulates to elected officials, the public, and frontline staff the department's vision, mission, and performance for each of the strategic goals:

◆ **Preserve infrastructure.** Utah DOT manages an extensive highway system of roads, bridges, signs, culverts, guardrail, and other facilities collectively valued at approximately \$31 billion. The department has a long-term strategy to preserve and maintain the transportation infrastructure with a combination of measured asset performance, routine maintenance,



Utah DOT's yearly progress on its safety, infrastructure preservation, mobility, and economic goals is outlined in *Strategic Direction and Performance Measures*.

Safety innovations, such as this diverging diamond interchange in St. George, are part of an effort to reach zero fatalities on Utah roads.

PHOTO: UTAH DOT





PHOTO: UTAH DOT

Measures to make snow removal more efficient and to increase mobility and safety include weather forecasting technology and the evaluation of road conditions within an hour of a storm event.

and regularly scheduled projects. Utah DOT is able to use limited funding to maximize the long-term health of roads, bridges, and other assets.

◆ **Optimize mobility.** Utah's population has grown by 75 percent in the past 25 years. In that same time, vehicle miles traveled have nearly doubled. The growth has increased demands for capacity, and the increased system use has strained scarce resources for preserving and extending the service life of roads and bridges. The department prioritizes capacity projects based on a combination of objective criteria: congestion, safety, vehicle use, and economic development.

◆ **Zero fatalities.** The department has a goal of zero fatalities on Utah roads. Performance management is an integral reason for a net decrease in fatalities of 41 percent from 2000 to 2013. In pursuing this goal, Utah DOT focuses efforts on four areas: engineering, education, enforcement, and emergency services. The department has implemented specific programs with defined performance measures in each of these areas.

◆ **Strengthen the economy.** Utah DOT recognizes that the transportation system enables economic growth and empowers prosperity. The goals of preservation, mobility, and safety contribute to a strong and prosperous economy.

Strategic Direction

At first glance, a vision or strategic direction may seem unrelated to performance management, but Utah DOT has found the success of both inextricably linked. Performance measures are necessary in defining objectives—understanding where an organization is helps in determining where it should go. Similarly, a clear strategic direction enables an orga-

nization to choose which data to capture; performance management becomes integral to success and is not a superficial or obligatory process.

Performance management is integrated vertically across Utah DOT, from executive-level leaders to frontline designers, construction engineers, and maintenance staff. The coordinated effort by the entire department ensures successful performance management.

Each group has a key role in creating a sustainable culture. The highest level of leadership articulates the vision and a strategic direction. Management sets goals and performance targets that align with the vision and strategic direction; management implements programs and projects to achieve the agreed-to performance measures. Frontline staff develop personal performance plans with specific goals to support established performance measures.

In addition to laying a cultural foundation through strong leadership and a clear vision, a functional performance management program requires a structure that integrates performance management into decision making. This may be accomplished in several ways, each with its own benefits and challenges. Utah DOT favors the flexibility of a steering committee, which reviews performance and prioritizes actions, instead of written policies and procedures that provide an if-then set of rules for determining the proper course of action. Whatever the structure, leadership must champion the value of performance management and must allow the structure to function.

Steering Committee

At Utah DOT, the Asset Management Steering Committee sets the direction for the department's asset management programs, including review and approval of individual safety, capacity, and preservation program funding. The committee collaborates in bimonthly meetings and provides structural support across the agency divisions, reducing the risk of siloed or duplicative efforts and ensuring that spending and actions are in line with the strategic direction.

Utah DOT's deputy director chairs the committee. Voting members report directly to the deputy and include all four region directors, the engineer for operations, and the directors of programming and planning. The department's division managers serve as nonvoting members.

The steering committee uses data collected through the performance management program to prioritize and deliver projects. Each spring, the committee reviews the program and the agency's direction, as well as specific division performance goals

and targets. Each fall, the committee finalizes performance management objectives and makes recommendations for funding. The committee reviews the program performance measures, the targets, the expected future trends, and the recommendations with the state's Transportation Commission, which is responsible for approving the funding.

multilane concrete Interstates to rural two-lane asphalt roads. Approximately \$250 million is required annually to preserve this \$25 billion asset. Utah DOT's pavement management philosophy, as noted earlier, is that good roads cost less—in other words, timely, cost-effective treatments minimize cost while achieving the greatest long-term benefit.

Practical Case Studies

Pavement Management

The department manages and preserves approximately 16,000 lane miles across the state, from urban

Pavement Optimization

The department manages a total of 243 state highways. These highways are divided into 2,446 individual sections of varying length. Each section has its

Building a Sustainable Culture of Performance Management

Two years ago, the Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law. Performance management, a data-driven decision-making process, is a major thrust of the legislation. Successful implementation by state departments of transportation (DOTs) is good business practice and will benefit customers and the public.

The lasting legacy of MAP-21 for Utah DOT and other transportation organizations will be the establishment of a holistic approach to managing assets, from vision and strategic direction to the establishment of a robust inventory, to developing performance goals and targets, and to allocating funds to optimize projects. This will establish a culture of sustainability.

Performance management has provided Utah DOT with the ability to articulate its vision by transforming data and information into knowledge. The department

has created a data-driven, transparent approach that optimizes limited funds to create not only a sustainable asset management program but also a sustainability culture within the agency. The graphic above illustrates Utah DOT's view of how performance management can help build a sustainable culture founded on a clear vision.

Following are definitions of each element in the figure, with examples from Utah DOT's strategic goal to preserve infrastructure:

◆ **Vision:** a philosophy that determines the culture and a clear goal for the future of an organization. For example, the "good roads cost less" approach creates a sustainable program and a culture that maintains pavements as an asset for future generations.

◆ **Strategic direction:** a course of action to achieve the vision. To accomplish the task, "set performance targets for spe-

cific classes of roads," the department uses a data-driven process to manage the preservation of the highway system; the specified targets help identify the lowest-cost treatment with the greatest benefit.

◆ **Data:** facts and statistics collected for records and analysis. The guideline, "Deploy the most current technologies," aims to generate data that provide a complete representation of the highway system.

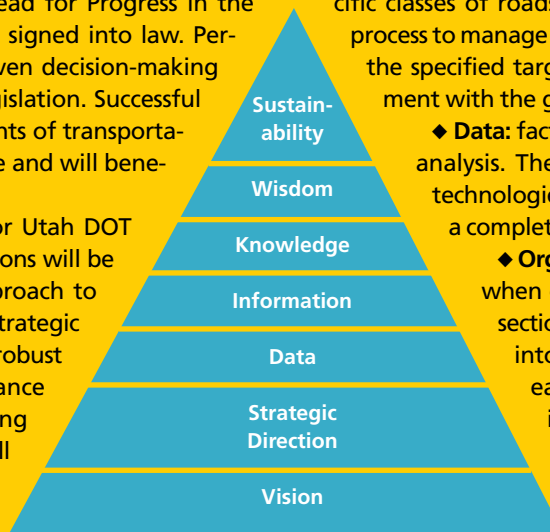
◆ **Organizing information:** data gain meaning when organized in context. "A plan for every section of every road" divides 243 state routes into 2,446 individual sections, documents each section's individual history from original construction to preservation, and forecasts future treatments.

◆ **Knowledge:** information given greater meaning by testing outcomes and measuring results. Through "selection of the right project at the right time," the department chooses sections for preserva-

tion treatment to minimize total costs and to maximize the performance of the entire statewide system.

◆ **Wisdom:** knowledge proven through performance management. Utah DOT foresaw that funding would not be sufficient to practice the "good roads cost less" philosophy on low-volume roads. Acknowledging that "funding constraints limit pavement management to high-volume roads," the department has implemented a tiered system to preserve high-volume Interstate and National Highway System roads.

◆ **Sustainability:** a sustainable culture emerges when wisdom is documented and becomes integral to decision making. The effort to "create an enduring culture" of pavement management at the agency has spanned two generations and has brought continuous improvements, not only in pavement management performance but in the creation of a cultural approach to pavement management for following generations.



Utah DOT's view of how performance management can help build toward a sustainable culture founded on a clear vision.

Utah DOT approaches pavement preservation with a focus on the most beneficial and cost-effective treatment, instead of pursuing a “worst-first” strategy.



own history—date of construction, traffic volumes, facility type, results from the biannual distress surveys, and next scheduled preservation treatment.

With pavement optimization, the department selects the treatment that provides the greatest benefit at the lowest cost, instead of following a “worst-first” strategy. Utah DOT recommends a program of specific projects to fit the available budget.

Pavement Condition Forecasting

Utah DOT uses distress surveys and modeling techniques to forecast pavement conditions. Forecasting takes into account the type of facility—Interstate, National Highway System, urban, or rural; the materials—concrete or asphalt; the region; and the available budget.

Maintenance Management

An annual expenditure of \$250 million would be needed to maintain the overall condition of the entire state highway system, providing the greatest benefit at the lowest cost. Funding has been limited, however, to \$210 million per year in each of the past six years.

Utah DOT has created a tiered system for classifying highways: Interstates; Level 1, with average annual daily traffic (AADT) more than 1,000 and truck volume more than 200; and Level 2, with AADT less than 1,000. Funding is sufficient to maintain Interstate and Level 1 roads but not the Level 2 roads.

Tiered Preservation

The tiered preservation strategy addresses the risk of trying to maintain all roads equally with limited funding, which would cause all highways to drop to

a lower pavement standard. Discussion with stakeholders illuminated the need to preserve the highways used by the greatest number and emphasized the tremendous initial and ongoing investments in the Interstate and National Highway Systems.

Maintenance crews at individual maintenance stations were directed to maintain Level 2 roads at the highest level possible. In the past six years, the department has continued the tiered approach. Every year, Utah DOT has collected automated pavement distress conditions for all roads; the data revealed that the conditions of Interstate, National Highway System, and Level 1 roads not only were maintained but had steadily improved in comparison with initial targets. The department concluded that a greater amount of pavement could be maintained with the same level of funding as in previous years.

In 2013, after careful review, Utah DOT lowered the threshold for Level 2 roads from 2,000 vehicles a day to 1,000 vehicles a day. As a result, approximately 785 miles of roads were reclassified as Level 1 and are benefiting from active preservation.

Zero Fatalities

Utah DOT has set an ambitious goal for safety: zero fatalities on state roads. The number of fatalities has trended downward in the past 10 years, despite the increases in population and vehicle miles traveled. In 2012, Utah recorded its lowest number of fatalities since 1959.

Utah DOT’s four focus areas—education, enforcement, emergency services, and engineering—require the collection, processing, and analysis of data from many sources. Safety programs are developed and

specific projects implemented. Safety performance goals and targets drive critical decisions across the agency. The zero fatalities goal is communicated within the department and during monthly Transportation Commission meetings, educational campaigns, and through the media.

Engineering Solutions

Providing the best engineering solutions within the available budget will lead to dramatic reductions in highway crash fatalities. The department uses performance measures to allocate funds to specific projects within four safety programs—highway safety improvement, spot safety improvement, traffic signals, and railroad safety—to reduce fatalities and serious injuries.

Reduction in Fatalities on US-6

Nearly 10 years ago, *Reader's Digest* named US-6 one of most dangerous highways in the nation. Large sections of the highway traverse mountainous terrain and winding canyons as the road crosses the state diagonally, linking southeast and northwest. This high-speed facility serves as an important transportation lifeline for industry, trucking, and tourism, and connects with I-70 and I-15.

In the past 10 years, the department has implemented many safety measures to reduce the number and severity of crashes dramatically, with fatalities declining from approximately 15 to 3 per year, and serious injuries from 25 to 4 per year. Improvements have included the widening of shoulders; the addition of climbing lanes for trucks; dynamic speed signage; and the installation of guardrail, centerline and shoulder rumble strips, and passing lane signage.

Cable Barrier

Since 1999, the number of serious and fatal crashes caused by vehicles crossing the median on Utah roads



PHOTO: UTAH DOT

has decreased by more than 180 incidents per year—that is, by more than 95 percent. The installation of safety features, such as cable barrier, has helped to reduce crossover crashes to fewer than 10 per year.

Optimal Outcomes

As public employees, state DOT staff are responsible for assuring that the public's investment in the transportation system produces optimal outcomes. The outcomes must be achieved by collaborating with elected officials, the public, and the agencies responsible for delivering results to determine and define strategic goals.

But having goals does not assure success. The contributions of every employee, contractor, consultant, and supplier must align with the goals. Performance management measures determine whether the efforts are moving in the right direction.

The transformation of Utah DOT owes much to the positive influences of past leaders Tom Warne and John Njord, who championed and established a culture in which employees had a clear understanding of strategic goals and had the freedom to innovate in pursuing those goals. Utah DOT employees practice and embrace performance management in delivering successful programs and maximum value for every dollar invested.

Utah DOT's leadership has laid a foundation for performance management to thrive by investing in people; by partnering with the Federal Highway Administration, which developed many of the tools now in use; and by supporting the research community, which has helped determine the agency's direction. Utah DOT's commitment to performance management and asset management has made a difference, and the public has benefited.

Since it began in 1994, Utah DOT's Incident Management Program has increased first-responder safety and has reduced congestion and secondary crashes.



PHOTO: UTAH DOT

Cable barriers and other roadway safety features have reduced crossover crashes by more than 95 percent per year.