FHWA Transportation Performance Management Case Study

North Carolina DOT: Development of a Performance Management System

October 2013

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1. Introduction

A. NCDOT Facts

North Carolina's Department of Transportation (NCDOT) was officially established through the Organization Act of 1971 that combined the State Highway Commission and the Department of Motor Vehicles. It is one of the largest state departments of transportation in the country, managing all modes of transportation with an annual operating budget of approximately five billion dollars and employing a workforce of approximately 13,000. NCDOT oversees almost 80,000 road miles, second only to Texas, and operates the second largest state-owned ferry system in the United States.

With such an expansive transportation system and large workforce, in the early 2000s NCDOT leaders recognized the need for improved and accountable performance. Although NCDOT had included performance management as part of asset management, it was not implemented effectively across the agency, nor could it adequately address a number of internal and external pressures. Internally, the Department was struggling to effectively and efficiently prioritize and fund projects, manage and retain employees, and communicate effectively with its customers. NCDOT was only delivering approximately 25 percent of the programmed projects included in the annual State Transportation Improvement Program (STIP). NCDOT needed a more stable, objective and data driven method to address external factors such as flattening revenues, decreasing Federal funding, political influence, and increasing costs. The state was also experiencing significant population growth, with population expected to grow 50 percent in the next 25 years, straining the limits and capacity of transportation infrastructure across the state. These factors led to a significant overhaul of the entire Department beginning in 2007.

B. Identifying the Problem

After determining the internal and external pressures were too significant to ignore, NCDOT hired McKinsey and Company (McKinsey) to analyze and provide recommendations for a department-wide transformation process. The NCDOT senior leadership saw no viable alternative than to recreate a better performance management system, and preferred to take the initiative to re-structure and re-invigorate the Department rather than wait to be mandated by the state legislature or Governor.

> *"Operational processes could benefit from organization- wide metrics- based management."*
> - *McKinsey Report*

Through in-depth quantitative and qualitative research McKinsey identified aspects of the Department that were well positioned for transformation. McKinsey conducted several town hall meetings and hand written assessments of NCDOT employees in order to ensure department-wide input and participation among employees in all departments (including those who do not have access to computers during the workday). With an impressively high employee response rate of 80 percent and strong commitment from senior leadership, NCDOT demonstrated its dedication to address the problems within the agency and begin a successful transformation process.

The information gathering process identified several key areas for improvement. The McKinsey diagnostic found NCDOT was falling behind public and private sector organizations that had focused on operational efficiency and outcome-based results. McKinsey identified the following problems:

- Improper monitoring and reporting of performance results were making the process ineffective;
- Performance measures were not connected to clear and concise Departmental goals;
- There was limited strategic planning and no clear project prioritization;
- Employees' performance was not linked to a Department- wide mission; and
- "Siloed" business units and Department structure led to inefficiencies, misunderstandings, and missed opportunities for collaboration.

C. Forming a Strategy

Building from the McKinsey assessment, in 2007 NCDOT developed a significant process to transform the way it conducts business. The transformation of the entire Department required five key initiatives:

- Strategic Direction,
- Planning and Prioritization,
- Program and Project Delivery,
- Human Resource Management, and
- Performance and Accountability.

Each initiative directly tied to refining the NCDOT performance management system. First, NCDOT needed to set a Strategic Direction, which included fortifying and enhancing the agency mission, goals, and values. This crucial first step allowed the Department to link each performance measure to a specific organizational goal, thus guiding all employees. Highlighting the importance of safety, customer service, integrity, diversity, and quality in their core values, NCDOT could begin to build a performance management system with clear and concise direction.

The second of the five transformation initiatives was Planning and Prioritization. By creating a Strategic Planning Office and adhering strictly to their STIP, NCDOT was prepared to make long-term, data-driven investments in transportation planning and programming. Using performance measures as well as stakeholder input, projects are scored and prioritized.

The objective and data-driven top ranked projects are then included in their STIP, five-year work program, and as far down as one-year work plans for the associated business unit. With a better idea of how to plan and prioritize projects, NCDOT then could focus on the third initiative identified by McKinsey. Project and Program Delivery naturally will benefit from the better project prioritization

process. On-time and on-budget project delivery is vital to NCDOT meeting most of their new strategic goals.

The fourth step the McKinsey diagnostic recommended was to improve human resource management. NCDOT had trouble both in retaining high performing employees as well as rewarding employees for outstanding effort. By facilitating a supportive work environment, from a streamlined hiring process to implementing mentoring programs, NCDOT laid the groundwork to significantly improve their talent management system. The first four steps led to the fifth key initiative, to incorporate department performance and accountability at all levels within the agency. This would unify employee and management commitment to the Department's mission and goals, and improve internal communication and public perception through transparent and accountable results.

With the diagnostic completed, it was up to the Department to continue and build upon the hard work that had gone into designing the comprehensive transformation process.

2. Addressing Performance Management System Concerns

NCDOT was determined to use the transformation process to create an effective performance management system. The new strategic direction of the Department brought focus and greater coordination, and an approach to resolve outstanding performance issues. Such an extensive system-wide overhaul surfaced fundamental concerns around data management and employee accountability. NCDOT did not avoid addressing these early concerns. Through strong leadership and thorough analysis, NCDOT developed solutions to fit their needs and to move ahead with implementation.

A. Coordination across Disciplines

Figure 2 NCDOT ITS Operations Center

The McKinsey report identified the lack of communication among the 70 business units in the Department. This was one challenge NCDOT had to address in order to build an effective performance management system. With a clear Departmental mission in place, the business units were now working toward a larger goal together. As is typical of large organizations, it is easy to focus narrowly on individual business units and not consider or even understand the broader view of operations and work functions of other units.

In order to achieve proper and dependable data management in particular, it was critical that the information technology (IT) division and the business units immediately begin to build strong relationships. Over the past five years NCDOT devoted time and resources into building a seamless and transparent relationship between these different elements of the Department. Beginning with the facilitated workshops to acquire preliminary data requirements around performance elements, NCDOT

invested heavily in building communication between IT employees, the unit leadership, and employees of each business unit.

B. Data Management

Data management is a key component of performance management and requires effective data collection and analysis. All 70 business units collected data, but did not coordinate collection schedules, data storage, or data analysis. NCDOT held initial workshops to learn from managers what data collection practices were in place and where the data was stored. They discovered there were over 300 databases and more than 1,000 datasets used for measuring business operations. The disorderly and chaotic datasets identified

NCDOT Data Fast Facts:
- Single reporting source (Business Warehouse)
- Primary data warehouse used is SAP
- Over 100 employees completed five major tasks
    1. Identifying data and metric requirements
    2. Mapping and cleansing data
    3. Developing technical architecture to extract data from source systems
    4. Validating and testing data
    5. Developing dashboards and reports

through the workshops revealed a data collection process that could not support the performance management system under development. In order for performance metrics to work, they must be based on unified, continuous data that is input correctly and linked to a greater purpose of the Department. The data cannot be collected on an ad hoc, need- to- know basis, but rather in real- time so constituents, stakeholders, and NCDOT employees know how they are performing instantaneously. The data must also be shared among internal decision makers.

NCDOT began a large integration effort to streamline data collection. The consolidation of NCDOT's datasets attempted to break down the "siloes" between units and make operations more effective and efficient. NCDOT significantly narrowed the number of datasets from 1,000 to 400 in two years, in part by integrating data that applied to more than one unit. The data integration process is on-going and continues to evolve and improve. The intricate consolidation process helps to remove information barriers and foster a greater understanding of how the Department works together. NCDOT also used this

Figure 3 NCDOT website Dashboard

process to automate data collection, allowing it to publish results in real-time internally and externally (Figure 3). Through the development of their user-friendly public Dashboard, NCDOT displays core performance measures on their website for the public to monitor in addition to an internal dashboard that contains more metrics for employees and management to track. As soon as data is entered into the system it is automatically updated and displayed on the appropriate dashboard (often times overnight).

Once data is collected properly, the next step is to determine what to do with it. In order to meet goals related to accountability and results, NCDOT needed to adopt performance metrics that would connect to the larger strategic direction of the Department as well as to individual employees. A performance metric includes three components: the performance measure or metric definition, a target, and a weight.[1] Applying the correct data to a well- defined performance metric and further linking it to employee performance would ensure that NCDOT was allocating resources and prioritizing and delivering projects efficiently and effectively.

NCDOT began to develop initial targets for performance metrics and establish baseline levels. Over time, they have continued to update targets and set challenging, yet attainable, annual goals. The Department now uses the data, targets, and metrics to drive project planning and prioritization. One notable result of the NCDOT transformation is that they directly relate the system-wide performance measures to business unit outcomes and individual employee appraisals. Each business unit is required to develop a one-year work plan that establishes certain higher-level goals, forecasting operational performance as well as budgetary needs. In addition, each employee is explicitly tied to influence up to 10 performance measures that are published on individual dashboards and affect the employee's year-end appraisal. There was initial resistance to such an intense level of employee accountability, but in the last several years there has been a noticeable cultural shift throughout the agency that recognizes the importance of daily individual performance to the larger mission and goals of the Department.

3. Results

A. Project Prioritization

After it addressed the early concerns with relationship-building and data management and enacted the transformation process, NCDOT saw many positive results. The project prioritization process is methodical and has proven to fit their needs. Everything is now data driven, looks at long-term as well as short-term needs, and is constrained based on available revenue. With constrained resources, NCDOT uses the performance management system to get the most value from investments.

The asset management component and Infrastructure Health performance measure highlights the importance of data consolidation and relationships between various divisions. Several different divisions report data to develop a comprehensive overview of infrastructure health in the state. From statewide divisions to individual
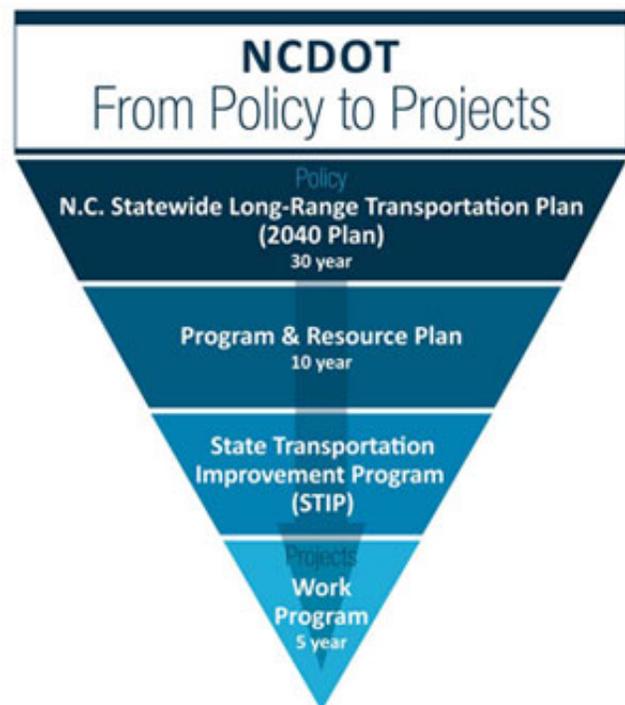

Figure 4 Flow from Policies and Plans to Projects

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[1] North Carolina Department of Transportation, "Transformation Management Team Final Report Volume Eight: The McKinsey Report," October 2007

counties, over 22,000 samples of 0.1 mile sections are examined and recorded. The data is then analyzed into 11 different elements and compiled to create an Infrastructure Health Index scorecard. This scorecard helps to inform project planning and prioritization, identifying locations with the most critical maintenance and improvement needs. Furthermore, information from the scorecard feeds into the business unit work plans and employee evaluations.

In 2009, North Carolina's Governor signed Executive Order Number 2, requiring strategic planning and prioritization. Deciding to take politics out of projects through the "Policy to Projects" initiative, NCDOT developed prioritization formulas that incorporated stakeholder input and meticulous work plans to create an efficient strategic prioritization process. As seen in Figure 4, the project prioritization process begins with the 30-year statewide plan and goes down to inform short-term decisions. Before finalizing the work plan, MPOs rank projects in their areas and that score is combined with data results and the priority ranking from the NCDOT divisions. Balancing the three inputs, projects are then tiered into statewide, regional, or sub-regional categories. Using this objective, metric- driven prioritization process, NCDOT maximized their $10 billion biennial budget to meet constituent demand.

B. Looking at the Numbers

NCDOT has results to show the success of this arduous process. The impressive results the Department achieved in the past several years are a testament to the performance management system. Here are a few highlights:

- Employee performance ratings now resemble an appropriate bell curve, with only two percent below expectations, 75-80 percent meeting expectations, and 15 percent exceeding expectations. Prior to implementation of the new performance management system over 90 percent of employees were rated as exceeding expectations, while the agency was only delivering 25 percent of the overall program.

- Project planning and prioritization is objective and data- driven rather than subjective and political, allowing NCDOT to deliver over 75 percent of its programmed projects as of 2012. This annual result continues to trend upward as the program becomes more stable.

- In the 2012 Annual Report Performance Scorecard, NCDOT exceeded the highway safety targets in lowering both the statewide network crash and fatality rates to 230 and 1.15 respectively.

- Looking at infrastructure health, 66.2 percent of bridges were rated in good condition and the average highway feature condition score was 89.7, greatly surpassing the target of 84.

- Employee engagement has increased. Every two years, NCDOT conducts an employee survey assessing the engagement level of its approximately 13,000 employee workforce. Since the first survey was administered, the overall employee engagement score for the agency has increased 2 percent, and some divisions greater than 10 percent.

NCDOT is seeing positive results, and while there are still opportunities for improvement, NCDOT is prepared to meet the challenging goals they set for themselves. As is evident in the numbers, NCDOT has succeeded in institutionalizing a seamless performance management system that addressed institutional challenges and barriers.

4. Conclusion

A. Lessons Learned

NCDOT's senior leadership identified a problem and need, and took initiative to begin building a performance management system, long before any such program would be mandated. The result has been a strong, self-driven implementation process. The NCDOT experience offers several important lessons:

- Timing and Pace Matter

  Along with the successes, looking back, NCDOT also recognizes that this rapid transformation proved to be difficult and strenuous on employees. Such an extensive restructuring requires strong vision and leadership, but it also needs to be well-paced and work well for high performing employees.

- Focusing on the People Builds a Stronger System

  Two key components of this process focused on the employees – the relationship building across divisions, and tying success to employee performance. These two initiatives were critical to making employees feel valued and integral to the process, while also providing a strong personal incentive for and commitment to the success of the system.

- Flexibility is Key

  NCDOT served itself well by developing a flexible system that is continuously fine-tuned to fit the needs of North Carolina and the Department. As part of the new performance management process, the Department schedules (and encourages) the review and update of the agencies mission, goals and priorities every four years to coincide with possible changes in executive leadership. This structured process allowed for the revision of NCDOT's mission statement to better align with the agencies new priorities in 2010. In addition, the foundation of the department's performance management system and the annual employee performance appraisal form was amended and reduced in length based on feedback from department-wide employee survey in 2011.

- Measure What Matters and Report it to Executives

  NCDOT developed and introduced a new internal performance reporting tool called the Operations Situational Report (Sit Rep) in March 2013. Prior to the Sit Rep executives and senior managers had no means of monitoring daily and weekly objective performance results without directly retrieving dashboard system results. The Sit Rep filled a gap in the executive performance reporting by establishing a "one-page paper dashboard" emailed to executives on a monthly basis that includes custom selected key performance metrics with hundreds of workforce results and outcome indicators for important business operations.
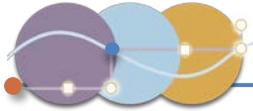
- Starting Somewhere

  When NCDOT's senior leadership began the process or transforming the agency's performance strategy they recognized it was not going to be an easy journey; however it was clear they had to start somewhere, whether in a large or small scale, to improve the performance strategy of the department. Rather than waiting for an inevitably forced change, senior leadership began by initiating a hard look at the foundational purpose of the state agency and how external stakeholders viewed its projects, programs and services. NCDOT started by realizing it had a significant opportunity for improvement, and then consulting with a neutral and well-renowned firm to assess the flaws and strengths and begin implementing a performance management culture change.

Only six years after beginning this process, NCDOT is a clear leader and model among state DOTs in performance management.

B. What's Next?

Always building from previous years' data and experience, NCDOT continues to improve and advance the performance management system. Most recently and notably, NCDOT is changing the project prioritization process. In June 2013, the North Carolina General Assembly passed a new Strategic Mobility Formula based on the recommendation of Governor Pat McCrory. The new program, now called the Strategic Transportation Investments (STI), will improve the project prioritization process and use stakeholder outreach and data analysis to fund infrastructure projects that spur economic growth. The STI effectively removes funding allocation barriers and better leverages available funds to improve the state's infrastructure for years to come.

In addition, the State of North Carolina will develop and implement a 25-Year Strategic Infrastructure Vision. As a lead agency in this effort, NCDOT will connect its performance management system on a short term level to a 25-year outlook with sound performance expectations and strategic goals aligned to transportation needs by corridors. The 25-Year Strategic Infrastructure Vision will be delivered in early 2014.

Additionally, in 2013 the Department will begin to integrate with the State of North Carolina's new performance management system. Given its size and scope, NCDOT is viewed as a leader in North Carolina having successfully established a sound and fully automated performance management system complete with strategic planning elements. In fact, the Department is tasked with championing and taking a lead in transforming the State's new and modernized performance management system.

NCDOT's performance management system is complex, yet adaptable. While it has taken time and effort to get to this point, the system in place now allows NCDOT to grow and work towards accomplishing its mission.

Figure 5 Train Platform

Additional information is available from the following:

North Carolina Department of Transportation- Transportation Reform webpage
http://www.ncdot.gov/performance/reform/

Transportation Performance Management Peer Exchange, "Know More about TPM Implementation: Rulemaking, Reporting, Reassessing and the North Carolina DOT Experience," June 2013
http://www.fhwa.dot.gov/tpm/resources/130618/presentation130618.pdf

North Carolina Department of Transportation, "NCDOT from Policy to Projects 2040 Plan: North Carolina Statewide Transportation Plan," August 2012

North Carolina Department of Transportation, "Transformation Management Team Final Report Volume Eight: The McKinsey Report," October 2007

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