

Scan 07-01

Best Practices In Project Delivery Management

REQUESTED BY THE

American Association of State Highway and Transportation Officials

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Executive Summary

Overview

Transportation agencies are experiencing unprecedented pressure to deliver projects for constituents. Many factors contribute to this high-demand environment, including increasing congestion, reduced work periods for construction, workforce issues, intense public interest and involvement, and severe revenue pressures. Agencies are seeking ways to deliver projects in the most efficient and expeditious manner possible.

The search for solutions to this situation has been a topic of intense interest for those involved in both this domestic scan program and its international counterpart for many years. No fewer than ten proposed topics were aggregated to create the topic for this particular domestic scan.

The team-defined Best Practices are those strategies and project-delivery applications that contributed to a state's success in delivering projects. Many of those cited in this report are clearly best among the best.

The analysis conducted for the desk scan refined the list of states for this scan based on several criteria:

- ❖ Program size
- ❖ Work complexity
- ❖ Metrics systems
- ❖ Performance against those metrics

Arizona, Florida, Missouri, Utah, Virginia, and Washington were chosen for visits due to a history of project delivery innovations and management.

The team also visited the City of Phoenix while in Arizona.

The scan team developed a hypothesis that common practices would be found among the selected states and that those common practices would exist in key areas of each agency's organization and process. The scan-team defined four focus areas:

1. Project management –including the wide array of management activities associated with project delivery
2. Performance measures—the tools used to measure, track, and adjust behavior
3. Innovative contracting practices—The team sought innovative practices with demonstrable results
4. Community involvement activities—including outcomes from project inception through the end of construction

The team developed and sent amplifying questions to the agencies prior to the visits to allow them to center their preparations on the specific areas of interest to this scan topic.

Summary of Initial Findings and Recommendations

The Best Practices are divided into the four focus areas; however, assignment of these Best Practices to a specific area is not always easy due to the overlapping nature of their application. The following define the four focus areas:

- ❖ Project management
- ❖ Performance measures
- ❖ Contracting practices
- ❖ Community involvement

Project Management

The Best Practices which the team identified in the first focus area fall into six major categories:

1. Project management structure
2. Shared leadership
3. Risk management
4. Use of consultants
5. Investment in GIS and data management tools for project delivery
6. Maintaining core competencies

Each category is listed, along with a sampling of the attributes of the Best Practices that set them apart from typical project management and delivery activities found elsewhere in the country.

Project Management Structure

Each agency had adopted and made extensive use of a project management structure with the following attributes of the observed practices:

- ❖ Project management systems work well whether they use a single project manager (PM) from cradle to grave or a series of PMs throughout the process.
- ❖ The best systems were composed of cohesive, multidisciplinary teams that communicated well among themselves.
- ❖ Successful systems can be either centralized or decentralized; however, roles and responsibilities must be clearly understood.
- ❖ Successful systems provided for effective hand offs from one division or discipline to another and from one work phase to another. In some cases, concurrent reviews were used to expedite the process.
- ❖ The accountability to which PMs and technical support units were held was another system hallmark.
- ❖ All agencies used a training program, some more formal than others. In addition, certain agencies included project management training along with the normal leadership-training curriculum.
- ❖ Certification as a PM is not always a requirement; it is, however, sometimes listed as a desirable credential.
- ❖ Consultants were used for much of the work; however, proper and close management of consultant resources and well-defined roles and responsibilities for both individuals and firms were identified.

Shared Leadership

The Best Practices observed in the area of project management had strong elements of leadership that enabled both individuals at multiple levels and organizations to function well. Much attention is usually given to the Chief Executive Officer (CEO) or equivalent, but the contribution of leadership at multiple levels in the project management process is apparent. The following key observations were made:

- ❖ Leaders drove accountability at all levels. Some responsibility was tied to performance measurement systems and other aspects involved in making sure that people delivered on both internal and external commitments.
- ❖ Leaders were willing to give their managers the tools they needed to be successful.
- ❖ The silo effect between functional or operational units was completely or nearly completely absent. Leadership's role in removing these barriers was evident.

- ❖ Leaders who were engaged in the process by asking tough questions, demanding accountability, and staying focused on the agency’s ultimate objectives seemed to get the best results.
- ❖ Leaders used performance management tools to achieve higher levels of performance—they didn’t measure just to measure.
- ❖ Leaders at all levels were central to developing and maintaining key relationships with third parties, such as resource agencies, utilities, and local and state governments.

It is clear that leadership was a key ingredient to the successful deployment of these Best Practices. However, the absence of a strong CEO does not dispel the possibility of implementing the kinds of programs described in this report.

Risk Management

- ❖ States with effective project management systems address risk in ways that enhance the delivery process. Managing risks involves identification, assessment, quantification, prioritization, and deliberate actions focused on the big-picture objectives.
- ❖ The Washington State DOT (WSDOT) Cost Estimate Validation Process (CEVP) program has clearly addressed risks and helped manage project costs and other factors that could have had negative impacts on its capital program.
- ❖ Phoenix uses a variety of innovative project delivery tools to mitigate and manage risks. For example, using Construction Manager at Risk (CMAR) for \$3 billion in projects has resulted in only one claim.
- ❖ State DOTs are managing schedule risks related to the National Environmental Policy Act (NEPA) process by not including projects in the committed Statewide Transportation Improvement Program (STIP) until they emerge with a Record of Decision (ROD). The final delivery of a project is set only after the NEPA process is done.
- ❖ Missouri has reduced project costs through a “Practical Design” philosophy that relies on the premise that good is good enough, perfection and quality are not synonymous.

Use of Consultants

Each agency uses outside resources to complement and enhance its project management process. Utilization rates range from a low of about 20% in Missouri to more than 80% in Arizona, Florida, and Utah. Using consultants in a way that complements and enhances a state DOT’s project management process is clearly a Best Practice. The following summarize important points:

- ❖ Private sector engineers and their firms are used for a variety of tasks to meet agency needs. Flexibility in how consultants were used and the skill sets required allowed DOTs to maximize their contribution to programs.
- ❖ Utah Department of Transportation’s (UDOT’s) streamlined consultant selection process was noted for its ability to bring firms into use very quickly.
- ❖ Florida was the only state that utilized private sector PMs to manage projects without a DOT PM assigned for oversight. The other states successfully used private sector PMs, but always placed a state employee in a management role.
- ❖ States with a high level of consultant use also had deliberate evaluation procedures in place to assess the consultants’ performance and their suitability for future work.
- ❖ Uniformly, state DOTs are concerned with maintaining core competencies for staff, even with the trend toward using consultants; however, no state has a Best Practice solution to this concern.

Investment in Geographic Information System (GIS) and Data Management Tools for Project Delivery

States employing Best Practices in project management are using a variety of technologies to enhance their effectiveness in this area.

- ❖ GIS and data management systems were clearly beneficial.
- ❖ WSDOT's Multi-Agency Permit Team (MAP Team) enables the DOT to better communicate and work to achieve the common goal of protecting the environment.
- ❖ Data management initiatives were integrated with performance measurement and community involvement efforts, to the benefit of all three.
- ❖ The use of visualization software to produce still images and renderings, three-dimensional (3D) animations, and 360-degree panoramas has grown; its ability to communicate important project information to stakeholder groups is well documented.
- ❖ Florida's Efficient Transportation Decision Making (ETDM) program is a huge step forward in improving concurrent reviews and communication between the DOT and stakeholder groups.

Maintaining Core Competencies

Declining core competencies is a universal problem facing the agencies visited by the scan team. Outsourcing ranged from 20% in Missouri to more than 80% in Utah and Arizona. No Best Practice was observed regarding retention of core competencies for engineers and, more specifically, PMs. A clear need exists here for AASHTO, either on its own or through NCHRP, to do additional research into how best to deal with this grave concern regarding maintaining core competencies in state DOTs.

Performance Measures

Performance Management System

Each agency visited had established some form of performance management system to measure its work for internal and, in many cases, external purposes. Virginia, Missouri, Utah, and Washington, each have effective systems in place. Virginia utilizes a dashboard on its Web site to provide up-to-date and easily understood information; it is also the most accessible to the public of all the observed systems.

Missouri's quarterly Tracker report offers a myriad of metrics that cover many areas of performance. It is available both as a published document and electronically on the Web. Washington's The Gray Notebook is also a quarterly report, with even more detailed measurements than those found in Tracker. Utah's ePM tracks many elements of the project delivery process, including schedule and finance. While useful for internal agency purposes, Utah's system is less accessible to the public than those used in Virginia, Missouri, and Washington.

- ❖ The following salient points reflect why the systems were chosen as Best Practices:
- ❖ The Virginia Department of Transportation (VDOT) has found that what gets measured gets done.
- ❖ Similarly, Missouri DOT (MoDOT) finds that when it is measured it becomes important to your agency.
- ❖ Some of the systems require substantial effort to sustain; it appears that Washington's system is the most demanding, followed by Missouri's.
- ❖ Common to each system is the need for accountability, the ability to measure and then improve performance, and the recognition that greater transparency is good for achieving ultimate transportation objectives.
- ❖ Each system flourished under the influence of strong leaders who believed that a tool was needed to help them through project delivery and in serving the public.
- ❖ Metrics used in these systems provided Arizona, Utah, and Washington with a means to measure contractor

and consultant performance, which they then used for other purposes (e.g., selection for other work).

Contemporary Public Accountability

Several of the performance management systems provided the public with a view into the agency. Virginia, Missouri, and Washington all share information of all types with those outside the DOT. The following is advice for others contemplating implementation of such systems:

- ❖ Gear the systems toward what the public wants to see and not what the agency thinks is important.
- ❖ Get agreement early on about baseline measurements, definition of business rules (e.g., what constitutes on-time or on-budget), and how the information will be used.
- ❖ Make sure that the systems are sustainable and maintainable. The Best Practices were agency-wide in their application, not limited to a single project or district.
- ❖ Use existing data or information normally generated as opposed to creating more work for PMs or others. Utah created a data warehouse that was fed by the ePM system, which was the key to the overall breadth and depth of that tool.
- ❖ Make sure the system is a tool, not a task.
- ❖ Use a top-driven approach for a quicker outcome or system than a collaborative initiative. A committee might be acceptable, but it may need a directive if it is unable to produce a system in a timely manner.

Contracting Practices

Innovative Construction Contracting

Each agency and the City of Phoenix made ample use of innovative contracting practices. Even among notable organizations, which are viewed as leaders in project delivery, varying degrees of tool usage exists. For example, Florida has a long and documented history of using design-build (DB). The Florida DOT (FDOT) no longer considered its use of this method innovative. Utah exhibited the most experience in using Construction Manager General Contractor (CMGC), while Phoenix was clearly the most frequent user of CMAR. All but FDOT had special units that handled or assisted project implementation by using innovative tools, such as DB, CMGC, and CMAR.

- ❖ Extensive use of these innovative tools set these DOTs and Phoenix apart from their peers.
- ❖ Benefits include fewer claims, improved relationships, faster project delivery, better quality, and better cost control.
- ❖ Every state used the FHWA's Special Experimental Projects-14 (SEP-14) process to implement some or all of these innovative practices.
- ❖ More than one state purposely avoided federal aid, allowing for more flexibility to utilize an innovative contracting practice that might not have been approved by the FHWA. FHWA might consider recognizing such practices as CMAR and CMGC as not being experimental at this point.
- ❖ Although each state was limited by the nature of legislative authority as to which delivery practices were used, they leverage whatever flexibility they have to implement the innovative delivery methods available to them.

Community Involvement

Early and Continuous Community Involvement from Concept through Construction

In the Best Practices the team observed, community involvement is not a singular moment but an effort from beginning to end. These states didn't wait for the media to tell their story; they proactively moved information to the

public using long-term tools, such as door-to-door flyers, and contemporary tools, such as YouTube and Twitter.

- ❖ Some states focused on corridor-specific branding, while others concentrated their efforts on agency-wide branding.
- ❖ WSDOT believes in reporting the news whether it is good or bad.
- ❖ States use formal and informal surveys. Utah has collected many years worth of formal survey data about agency performance and public perceptions.
- ❖ The states with the most effective programs had early and continuous involvement with stakeholders and resource agencies and maintained commitment tracking systems (CTSs).
- ❖ The states invested in good planning and developed realistic STIPs and Transportation Improvement Plans (TIPs) that managed public expectations and a good hand off between planning and NEPA-aligned projects for success.
- ❖ The Best Practice states recognized that NEPA was the right thing to do and, by using effective public involvement practices in NEPA, states were able to address stakeholder concerns effectively.
- ❖ Delegation of responsibility to PMs working directly with the public was a characteristic of the more effective communication systems.

External Relationships Are Important to Delivering Projects

Uniformly, states with Best Practices in public involvement worked hard to enhance relationships with outside stakeholders and others with whom they interacted. The states sought out and created relationships with a wide array of groups, such as service providers (e.g., contractors and consultants), resource agencies at state and federal levels, and third parties (e.g., utilities and local governments). In many cases the states created cooperative agreements that brought definition and formality to these relationships. Due to these partnerships, these states have been able to advance environmental streamlining and stewardship efforts.

Two excellent examples of strong collaborative relationships are Florida's ETDM and Washington's MAP Team effort, which have already been mentioned.

Planned Implementation Activities

The scan team recognizes the importance of implementing the review findings. Many important Best Practices were identified and would benefit other state and local transportation agencies. The following categories of activities are included in the team's proposed implementation plan:

- ❖ Publication of articles in journals and other industry-related publications, including *Public Roads*, *Better Roads*, *Governing*, *TR News*, and *Research Digest*.
- ❖ Presentations at AASHTO committees, Transportation Research Board (TRB) sessions, and other industry venues where practitioners would benefit from the sharing of these Best Practices.
- ❖ Use of contemporary media to share selected Best Practices such as Web sites, YouTube, and others.
- ❖ Hosting of webinars that highlight selected Best Practices.
- ❖ Integration of the team's findings into other association and industry groups, such as the Local Transportation Assistance Program (LTAP), AASHTO's Technology Implementation Group (TIG), and others.

All of these initiatives will be underway within 90 days of the scan tour.

