SCAN TEAM REPORT

NCHRP Project 20-68A, Scan 07-01

Best Practices in Project Delivery Management

Supported by the

National Cooperative Highway Research Program

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The purpose of each scan and of Project 20-68A as a whole is to accelerate beneficial innovation by facilitating information sharing and technology exchange among the states and other transportation agencies, and identifying actionable items of common interest. Experience has shown that personal contact with new ideas and their application is a particularly valuable means for such sharing and exchange. A scan entails peer-to-peer discussions between practitioners who have implemented new practices and others who are able to disseminate knowledge of these new practices and their possible benefits to a broad audience of other users. Each scan addresses a single technical topic selected by AASHTO and the NCHRP 20-68A Project Panel. Further information on the NCHRP 20-68A U.S. Domestic Scan program is available at http://144.171.11.40/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=1570.

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Disclaimer

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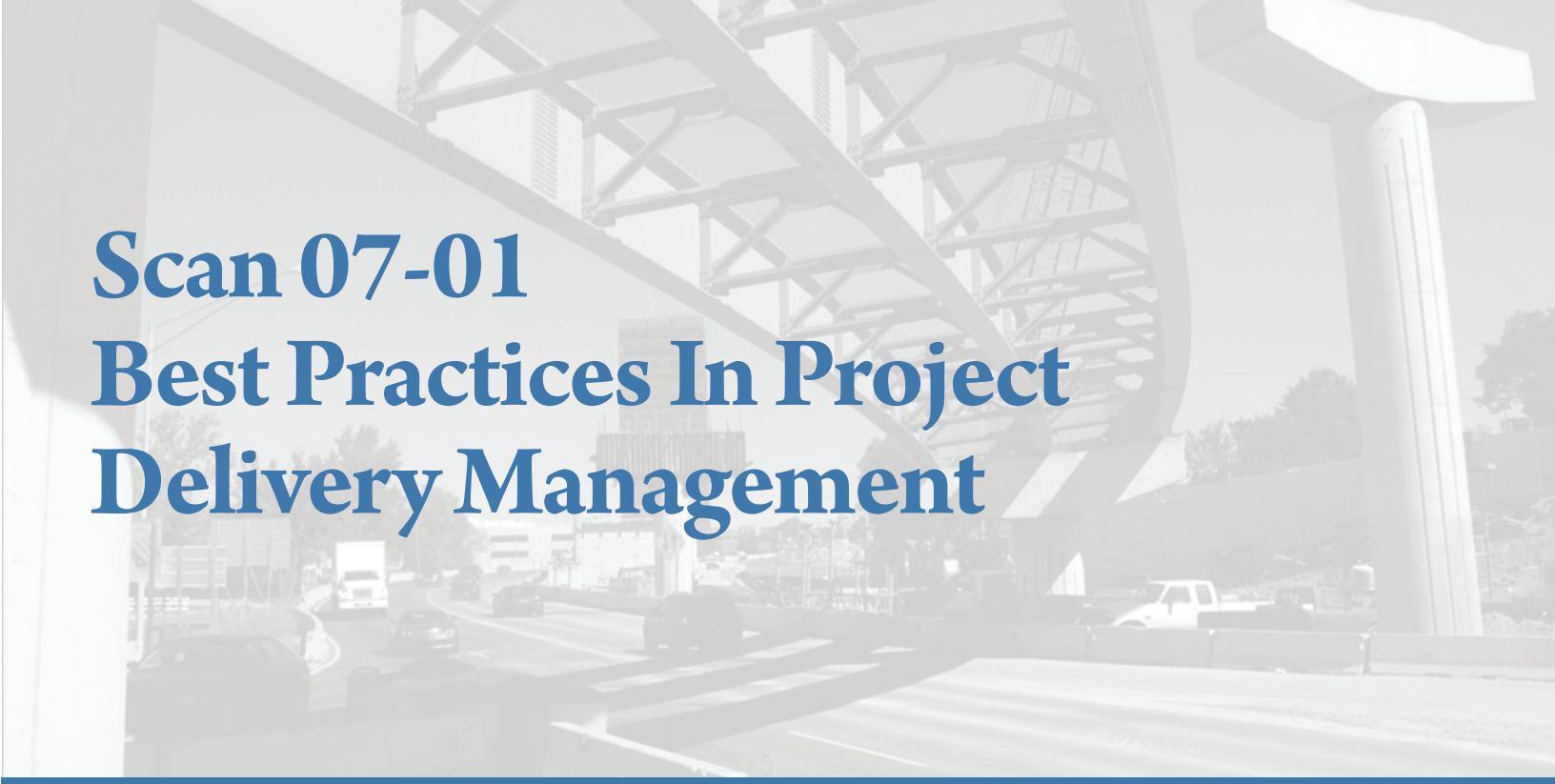

Scan 07-01
Best Practices In Project Delivery Management

REQUESTED BY THE

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Abbreviations and Acronyms

3-D	Three-dimensional
AAA	American Automobile Association
AASHTO	American Association of State Highway and Transportation Officials
ACE	Alliance for Construction Excellence
ACEC	American Council of Engineering Companies
ACPA	American Concrete Pavement Association
ADOT	Arizona Department of Transportation
AGC	Arizona General Contractors
AIDW	ADOT Information Data Warehouse
ARTBA	American Road & Transportation Builders Association
ARTC	Arizona Transportation Research Center
ASU	Arizona State University
ATCs	Alternate Technical Concepts
AZIPS	Arizona Integrated Planning System
BB	Bid-Build
BIM	Building Information Modeling
BOS	Board of Supervisors
CADD	Computer-Aided Drafting and Design
CAPS	Contract Administration and Payment System
CCP	Communication and Community Partnership
CD	Compact disk
CEO	Chief Executive Officer
CEVP	Cost Estimate Validation Process
CIA	Community Impact Analysis
CIP	Capital Improvement Program
CIPP	Capital Improvement Preservation Program
CM	Construction Management, Construction Manager
CMAR	Construction Manager at Risk
CMGC	Construction Manager General Contractor
CPMS	Capital Program Management System
CRA	Cost Risk Assessment
CSD	Context-Sensitive Design

CSS	Context-Sensitive Solutions
CTB	Commonwealth Transportation Board
CTS	Commitment Tracking System
DB	Design-Build
DBB	Design-Bid-Build
DOT	Department of Transportation
EAS	Engineering and Architectural Services
ECS	Engineering Consultant Section
EIT	Engineer in Training
ESA	Endangered Species Act
ESO	Environmental Services Office
ETDM	Efficient Transportation Decision Making
FAST	Field Office Automation System
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
FICE	Florida Institute of Consulting Engineers
FTBA	Florida Transportation Builders Association
FTE	Full-Time Equivalent
GEC	General Engineering Consultant
GIS	Geographic Information System
iPM	Integrated Project Management
iSYP	Integrated Six Year Program
IT	Information Technology
ITD	Intermodal Transportation Division
JOC	Job Order Contracting
L&D	Location & Design
LAS	Letting and Award System
LD	Liquidated Damages
LTAP	Local Transportation Assistance Program
MAG	Maricopa Association of Governments
MAPA	Missouri Asphalt Pavement Association Team
MAP	Multi-Agency Permitting Team
MoDOT	Missouri Department of Transportation
MOU	Memorandum of Understanding
MPD	Multimodal Planning Division
NACE	National Association of County Engineers
NCHRP	National Cooperative Highway Research Program

NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System
NTP	Notice to Proceed
OES	Office of Environmental Service
PAP	Performance Achievement Plan
PCC	Phoenix Convention Center
PCRF	Project Change Request Form
PCRO	Project Control & Reporting Office
PCRS	Project Control and Reporting System
PD&E	Project Development and Engineering
PDBS	Project Development Business System
PDIS	Project Development Information System
PE	Professional Engineer
PES	Proposal and Estimate System
PI	Public Information
PIE	Partnering for Innovative Efficiencies
PIO	Public Information Officer
PM	Project Manager
PMG	Performance Measurement Guide
PMI	Project Management Institute
PMO	Project Management Office
PMP	Project Management Professional, Project Management Plan
PMRS	Project Management and Reporting System
PPAC	Priority Planning Advisory Committee
PPMS	Program and Project Management Section
PPP	Priority Programming Process
PRB	Project Review Board
PRMS	Project Management Reporting System
QC/QA	Quality Control/Quality Assurance
QPI	Quality Process Integration
RFQ	Request for Quote
RLOI	Request for Letter of Interest
ROW	Right of Way
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SEP-14	Special Experimental Projects-14
SEPA	State Environmental Policy Act

SIMS	STIP Information Management System
SQL	Structured Query Language
STB	State Transportation Board
STD	Street Transportation Department
STIP	Statewide Transportation Improvement Program
TEIS	Transportation Executive Information System
TIG	Technology Implementation Group
TIP	Transportation Improvement Plan
TRAINS	Transportation Accounting and Reporting System
TRB	Transportation Research Board
UDOT	Utah Department of Transportation
VDOT	Virginia Department of Transportation
VE	Value Engineering
WACA	Washington Aggregates and Concrete Association
WSDOT	Washington State Department of Transportation

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.

CHAPTER 1

Introduction

Study Objectives

Transportation agencies are experiencing unprecedented pressure to deliver projects. No single factor has created this situation; many independent influences have contributed to this high demand environment. Among them is the rising tide of congestion on the nation's roads and highways. Between 1982 and 2005, the annual delay per traveler has increased from 14 to 38 hours, or over 270%. The cost of this congestion approaches more than $80 billion per year.[1] This increase has the collateral impact of extending the hours when roads and highways are functioning near or at capacity and reducing the number of hours available for construction or maintenance activities. Workforce issues, increasingly complex projects, and intense public interest and involvement further complicate project delivery.

Perhaps the most perplexing and difficult issue to deal with today is funding. Public transportation agencies are experiencing funding shortfalls of historic proportions. In May 2009, AASHTO published its most recent analysis of transportation funding needs in a report entitled: *The Bottom Line Report—2009*. The report documented transportation funding needs across the nation for highways, bridges, and transit will be $212 billion annually from 2010 through 2015. This compares to less than $80 billion investment by all levels of government in these systems in 2006.[2]

The impact on effective project delivery due to increased congestion, higher demand for service, and declining revenues on effective project delivery cannot be ignored. Public agencies have searched for more efficient ways to deliver capital improvement projects but feel an ever-increasing sense of urgency. It should be no surprise to transportation industry leaders that the first domestic scan under NCHRP 20-68A, 07-01, focuses on finding the best ways to deliver projects.

This scan topic originated in the companion effort sponsored by FHWA, AASHTO, and NCHRP known as the International Scan Program. Under the auspices of this program, a project emerged in 1997 with results summarized in a report entitled *Emerging Models for Delivering Transportation Programs and Services.* Interest in Best Practices in project delivery did not wane in the ensuing years; no fewer than ten proposed topics were aggregated to create the topic for this domestic scan.

Even with the effort to combine many possible topics under the moniker of Best Practices in Project Delivery Management, it was necessary for the scan team to narrow the subject area and create a more manageable focus. The center of this domestic scan is about the Best Practices that public transportation agencies are using to deliver projects more efficiently, at lower cost with successful public involvement. The scan focuses on agencies that exhibit better management, more efficient planning and environmental processes, and many of the other attributes associated with successful capital programs. The team then focused on specific areas to make the process manageable both for the team as well as for the agencies whose practices would be reviewed.

[1] 2007 Annual Urban Mobility Report, Texas Transportation Institute

[2] http://bottomline.transportation.org/

Focus Areas

The scan team developed a hypothesis that common practices would be found among the selected states, and would be in key areas of the agency's organization and process. This theory led the team to focus its review of these transportation agencies in four areas:

1. Project Management—This area included the wide array of management activities associated with project delivery such as organizational issues, division of roles and responsibilities, integration of agency functions with project development activities, and personnel issues.
2. Performance Measures—The team was interested in the tools used to measure and analyze management information, how metrics were used to influence behaviors, the transparency levels of measurement systems, and other ways in which agencies were using measurement to track and adjust behavior.
3. Contracting Practices—The team sought innovative practices with demonstrable results. Of particular interest were the systems and tools used, why they were adopted, and how they were integrated into the project delivery/management process. A topic of further interest was the extent of outsourcing practiced among the states.
4. Community Involvement—The team sought Best Practices that led to more effective project delivery including community involvement activities and their outcomes from project inception through construction.

To assist the transportation agencies being visited by the scan team, amplifying questions were developed and sent to the agencies to allow them to center their preparations on the specific areas of interest. Discussion of these questions is presented later in this chapter.

Study Organization and Approach

A detailed desk scan was prepared to help the team efficiently find and assess agency Best Practices of interest throughout the country. Using this information, team members determined which state DOTs and other public transportation agencies would be viable candidates for review.

The scan team decided to look for states that demonstrated successful project delivery, then focused on detecting common practices among the selected states. For scan purposes, Best Practices were defined as those the team felt contributed to DOT success in delivering projects. Finally, the team identified practices that were not common among multiple states but were clearly worth mentioning in this report.

In selecting sites, the Desk Scan process assessed not only state DOTs, but also public transportation agencies at all levels to ensure that city or county agencies whose practices would make them of interest to the industry at-large would not be overlooked. Unfortunately, further analysis revealed that most city and county entities did not have substantial capital programs or projects of sufficient complexity requiring bold or innovative practices.

The analysis conducted during the Desk Scan refined the list of states based on program size, work complexity, nature of metrics systems, and performance against those metrics. The combination of these factors influenced agencies to seek innovative solutions and practices to enhance project delivery.

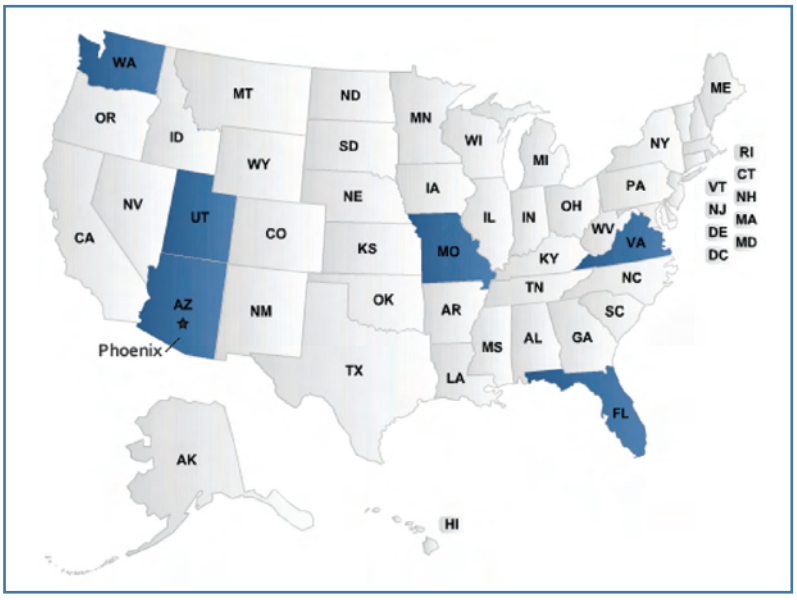

Figure 1.1 *States Visited by the Scaan Team*

The following states were chosen for visits due to a history of project delivery innovations and management:

- Arizona
- Florida
- Missouri
- Utah
- Virginia
- Washington

In addition, due to its aggressive use of innovative project delivery tools and its proximity to the Arizona Department of Transportation (ADOT), the City of Phoenix was chosen for a visit while the team was in Arizona. (Figure 1.1 reflects the sites visited by this team.) From February 22 through March 3, 2009, the scan team visited these agencies and exchanged information which has been compiled into this report.

Scan Team Composition

Scan-team members were selected to represent a diversity of knowledge and experience so that the Best Practices examined could be viewed in proper context for deployment across the United States. The ten-member team represented both FHWA and AASHTO and has many years of experience in project delivery, organizational management, public-policy issues, maintenance and operations of road and highway systems, and engineering design and construction. Team members and their organizations are listed in Table 1.1. Biographical information can be found in Appendix A, contact information in Appendix B.

Team Member	Organization
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Table 1.1. *Scan Team Members*

Implementation

Key to the transportation industry moving forward and advancing innovative actions and Best Practices is finding effective ways of sharing the information gained through this scan. The team evaluated the information gathered and developed an execution plan that can be used at the federal, state, and local levels. The plan, including implementation details, is included in Chapter 7.0, Planned Implementation Activities.

CHAPTER 2

Findings and Report Overview

The scan team was impressed at each site visit with the host agency's level of effort to ensure that the best information and practices were highlighted and shared. While many Best Practices had common themes and attributes, enough differences occurred between agencies to make the need to visit different entities clearly evident.

The scan team gathered, reviewed, and analyzed voluminous printed and electronic information for inclusion. This report attempts to capture the essence of many Best Practices; however, it is not possible to include sufficient detail for another public agency to fully implement the practice without further research. Readers are encouraged to take these Best Practices and explore them further through direct contact with the agencies visited, reviewing the state by state responses to the amplifying questions, or by using the provided links. Key contact information for host agencies can be found in Appendix C.

The next four chapters present the Best Practices identified by the scan team. Content is divided as follows:

- Chapter 3.0, Project Management
- Chapter 4.0, Performance Measures
- Chapter 5.0, Contracting Practices
- Chapter 6.0, Community Involvement

Not all the Best Practices highlighted in this report may be adapted by other state DOTs in their current form; however, many of them could be with modification. In some cases, the Best Practice may provide the reader with the nugget of an idea that could be transformed into a hybrid Best Practice in another state.

At the conclusion of the discussion on Best Practices, Chapter 7.0, Planned Implementation Activities, provides a summary of the implementation plan the scan team adopted to ensure that these practices are widely disseminated. Finally, a series of appendices contain important reference information relevant to this scan.

For the host agencies to prepare for the scan team's visit, the team compiled a list of Amplifying Questions that would guide them more specifically towards the details of the topic area of the scan. These were provided by the scan team either before or during their visit. The amplifying questions can be found in Appendix D.

As these responses were reviewed for incorporation into this report, the team decided that their content was valuable and full of details not to be overlooked. Therefore, Appendix E contains the responses from the transportation agencies to the amplifying questions.
In addition, Appendix F includes profile information about the individual state DOTs that were visited as part of this scan so that their programs and practices can be reviewed in context.

CHAPTER 3

Project Management

Many project delivery practices presented by the host agencies merit mention in this report. The team-identified Best Practices from the seven agencies included in the Project Management area scan 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 of these categories will be reviewed, including a sampling of the Best Practices identified as valuable enough to share with the industry. Collectively, they provide a blueprint for transportation agencies on how they may more effectively advance project management activities.

Project Management Structure

Long ago the private sector adopted the project management process or structure as a means to more effectively deliver projects. About 25 years ago state DOTs began to apply these practices to achieve the same successes enjoyed by the private sector. Each agency visited on this scan had adopted and extensively used a project management structure for many years. The maturity demonstrated by the agencies in using different aspects of project management was striking, and no doubt contributes to their collective success.

While each utilizes the project management approach in a major way, they all differ from one another in specific implementation methods. This indicates the concepts and practices are sound and that application can be modified to suit the specific needs and organizational attributes of any public agency. Some of the features of these observed practices will be discussed in the remainder of this section.

Use of Single or Multiple Project Managers

The scan team found that some successful Best Practices utilized a single project manager who followed a project from cradle to grave, while others used hand offs from one project manager to another during successive phases. The effectiveness of these two approaches appeared to be the same. Following are some examples of how the states utilized their project managers:

- **Arizona**—ADOT adopted the project management approach 25 years ago and focuses on using a single PM to manage a project throughout its life. PMs are housed in two divisions, Valley Project Management, which is located in Phoenix and handles all urban projects, and Statewide Project Management for all other projects. Project managers play a key role in following projects from inception through construction. ADOT attributes success with project delivery to four key characteristics:

    1. Dedicated project managers
    2. A corporate culture of project delivery
    3. Measurement and performance pay
    4. Early planning and scoping

They believe that people make the difference—any process can be successful with the right people to make things happen.

- **City of Phoenix**—The city has been using a project management system for a number of years. Its approach differs depending on which department is responsible. For example, Engineering and Architectural Services (EAS) and Aviation departments use a cradle-to-grave approach, whereas other departments typically utilize multiple PMs for different phases of the development and delivery process.
- **Florida**—FDOT has a mature project management structure, with internal PMs as well as extensive utilization of consultant project managers. Florida was the only state where consultant PMs functioned in the same manner and with the same authority as their DOT counterparts. Other states might use consultant PMs, but they always report to a state employee who is also a project manager. In Florida, the consultants report to the DOT management structure as if they were state employees. Florida was also the only state the team visited that consistently used multiple PMs to manage a project. The other states avoided changing PMs unless necessary due to concerns with workflow continuity. FDOT has found effective ways to deal with these transitions, and their program functions well.
- **Missouri**—MoDOT has adopted a project manager model where PMs do not have direct reports but manage teams of individuals gathered based on the project's technical needs. The PMs are mostly located in the district offices and call upon resources from both those offices and centralized headquarters units.
- **Utah**—UDOT PMs manage projects from beginning to end and do not change from phase to phase. They form technical teams comprising both internal UDOT individuals and those from the private sector to ensure that the proper expertise is applied. The UDOT PMs work mostly in one of the four regional offices with notable exceptions made for large mega-projects, such as the completed I-15 Design-Build Reconstruction and Legacy Parkway projects, the current I-15 Project in Utah County, and Mountainview Corridor project where PMs report directly to the agency's deputy director.
- **Virginia**—Virginia's DOT (VDOT) has various types of project managers, and the project management function is decentralized to nine districts. Megaproject PMs (i.e., multibillion dollar projects with statewide significance, such as Woodrow Wilson Bridge and Springfield Interchange in Northern Virginia) have dedicated project teams composed of in-house and consultant staff; these PMs have the highest levels of authority and direct access to the Chief Engineer and the Commissioner. Dedicated PMs are responsible for more complex and higher risk projects while "dual-hatted" PMs are also responsible for the technical discipline duties, manage turn-key, and lower risk projects. Depending on the project complexity and requirements, VDOT employs a "cradle-to-grave" project management approach or defines a handoff from the Preliminary Engineering PM to the Construction PM at award phase. Virginia differentiates project management requirements by the project's type and size.
- **Washington**—WSDOT has used project managers for many years. Even with large projects using general engineering consultants (GEC) to perform the majority of the work, a state employee oversees those efforts. PMs follow assigned projects through the bidding process, after which they are turned over to a new PM or Resident Engineer. Resources to fill a project's technical needs are gathered internally and externally to provide the needed expertise. Typically, WSDOT's project managers are professional engineers.

  Washington has established a Project Management Academy to train staff and consultants on how to be effective PMs. It is held once a year with training provided by internal staff and outside consultants. Topics include environmental processes, construction, budgeting, scheduling, and other management skills. WSDOT's project management practices are divided into two systems. The first is called the Capital Improvement Preservation Program (CIPP) and focuses on managing projects that do not involve major reconstruction activities. WSDOT uses a customized version of Sciforma's PS8 software to manage schedule cost and other features of these projects.

  WSDOT's second program is called the Project Management and Reporting System (PMRS) and is focused on the rest of its capital program. Additional information for this program can be found on the agency's Web site at http://www.wsdot.wa.gov/projects/projectmgmt/.

Centralized Versus Decentralized Project Management Functions

Project management functions varied in how they were dispersed among the Best Practices the scan team observed. Agencies that used a centralized approach included Arizona, Phoenix, and Missouri. Florida, Utah, Virginia, and Washington follow a decentralized model. Based on its findings and observations, the scan team determined that both models work, so centralization does not determine effectiveness. An observed key to success was the deliberateness with which each agency defined and implemented procedures that clarified roles and responsibilities for all participants in the project development process. Without this clear definition, success would be marginalized.

Another key attribute of these programs that appears to nullify the question of centralized versus decentralized project management is the clear definition of PM authority. The team noted that in each case the PM's authority was clear and recognized by other members of the team and the agency. With authority comes accountability; each of these agencies combined these project attributes in a way that left no questions about who was in charge and responsible for project delivery.

Another important element of successful project management systems was the smooth transition between units and project phases. While each agency still has a drainage division and structures group or equivalent, developed procedures ease the "hand offs" from one project phase to another and work product transfer from one discipline to another. Florida has become particularly adept at this by using multiple PMs and a decentralized approach to project management. Virginia actually includes procedures for these "hand offs" in project management training, in educational materials, and on their Web site. Clearly, the Best Practices the scan team observed were all effective in the PM area.

Training

All the agencies visited held project manager training. At VDOT, generic project management training with a formal training curriculum is provided in-house. In addition, it is working with the University of Virginia at Arlington (UVA) and private partners to develop a Transportation Project Management Institute (PMI), which will be an immersive "boot camp" focused on project management and Best Practices in the context of transportation projects. Virginia's project management function is guided by a formal policy memorandum containing 24 specific procedures available to PMs as they work. The City of Phoenix does some PM training in-house but also utilizes courses offered at Arizona State University (ASU) through the Alliance for Construction Excellence (ACE).

Certification of Project Managers

Each agency differed in how they handle project manager certification. The nearest thing to a national credential for project managers is the Project Management Professional (PMP) certification offered by the Project Management Institute (PMI). Some project managers in the states the scan team visited have obtained the PMP. However, no host agencies required certification for all project managers; Florida and Virginia put substantial emphasis on PMP.

In lieu of a PMP certification, a professional registration or professional engineer (PE) license is the closest credential to be found nationally for project managers. However, even this level of licensure isn't uniform between states or within individual states. In some cases (e.g., in Missouri), a PM must be a registered engineer. The City of Phoenix requires top-tier project managers to be licensed engineers, but on less complicated projects non-professional employees with substantial project experience may be managers. The Arizona DOT also follows this model and has produced excellent project managers who were not degreed engineers having professional registration or other certification.

Use of Consultants

Each reviewed agency used private-sector engineering and other specialty service firms for substantial amounts of work; the details of this usage will be covered later in this report. In beginning this section on Project Manager Structure, each agency realizes that proper management of outside resources is essential to effective program oversight. In all but Florida, agencies assign a state employee as an overall project manager to provide supervision and management to the consultant PM and respective staff. This is how they infuse a checks-and-balances approach into combined in-house and outsourced programs. Florida, Utah, Virginia, and Arizona have evaluation processes that assess how well a consultant performs. Utah's program is used not only to gauge past performance, but also to influence future selection of a firm based on how well it delivered on past projects.

Tools

Each state visited has its own version of tools to assist in project management. VDOT uses a system called Integrated Project Management (iPM), which integrates project information from various sources and provides real-time management information. Included in iPM are a series of sub-tools allowing schedule management, budgeting, and integration with VDOT's Dashboard program and others. Figure 3.1 and Figure 3.2 reflect the versatility and content available in iPM. This system provides many benefits, including management accountability, a single source of information, and a standardized process for use across the agency.

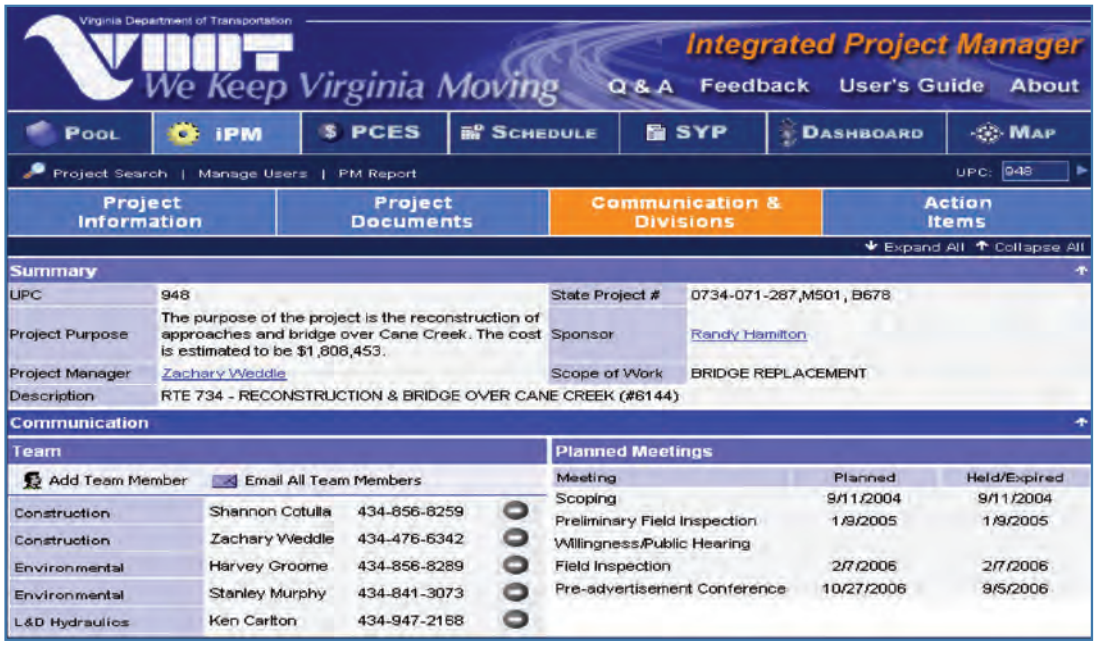

Figure 3.1 *VDOT's iPM Web Site*

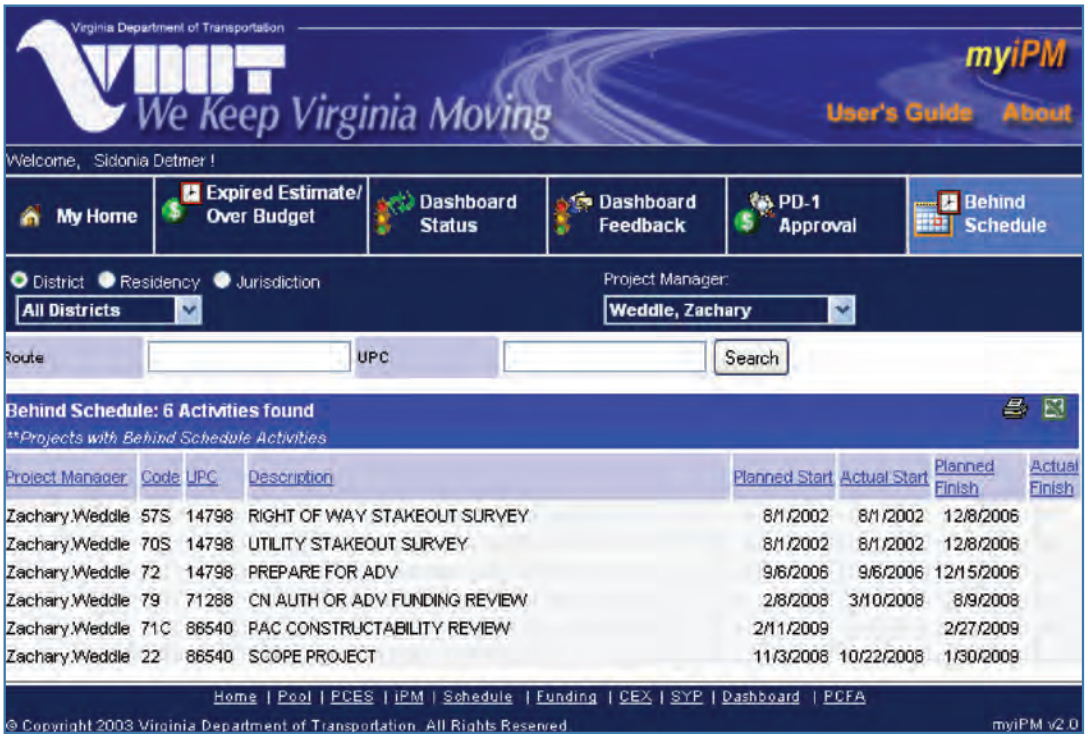

Figure 3.2 *VDOT's iPM Search on "Behind Schedule"*

VDOT cites the following benefits from using iPM on projects:

- Accountability, communication, simplicity, planning, and process improvements
- A single source for all project information, beginning to end
- Intuitive, fast, and reliable
- Integration
- Evolutionary, flexible, and iterative development approach
- Standardized processes and tools across the agency

Clearly, VDOT's project managers have a powerful tool in iPM to assist them in effective project delivery.

The City of Phoenix utilizes a software product called PROMIS to track project activity, scope, and schedule. It then uses SAS to track financial elements. Phoenix also integrates the two with another product for a full management solution.

Utah has a project management tool called ePM that was developed in-house and provides substantial utility to DOT PMs as they work. The ePM system can best be described as a tool that aggregates information from disparate sources into a data warehouse and then generates reports for use by project managers. Some tools used by scanned states require the input of substantial information not usually seen in the course of the PM's day-to-day duties. The team was looking for tools that would not only help the PM to manage projects efficiently, but also were not a burden or distraction due to requirements for feeding data into the system. Of all systems the scan team observed, ePM is probably the tool requiring the least extra work by the PM. This is an important point given how busy PMs are in managing their work—that they find their tools useful in their own right and not just something that helps others in the organization. Figure 3.3 and Figure 3.4 show two of the available screens in UDOT's ePM system.

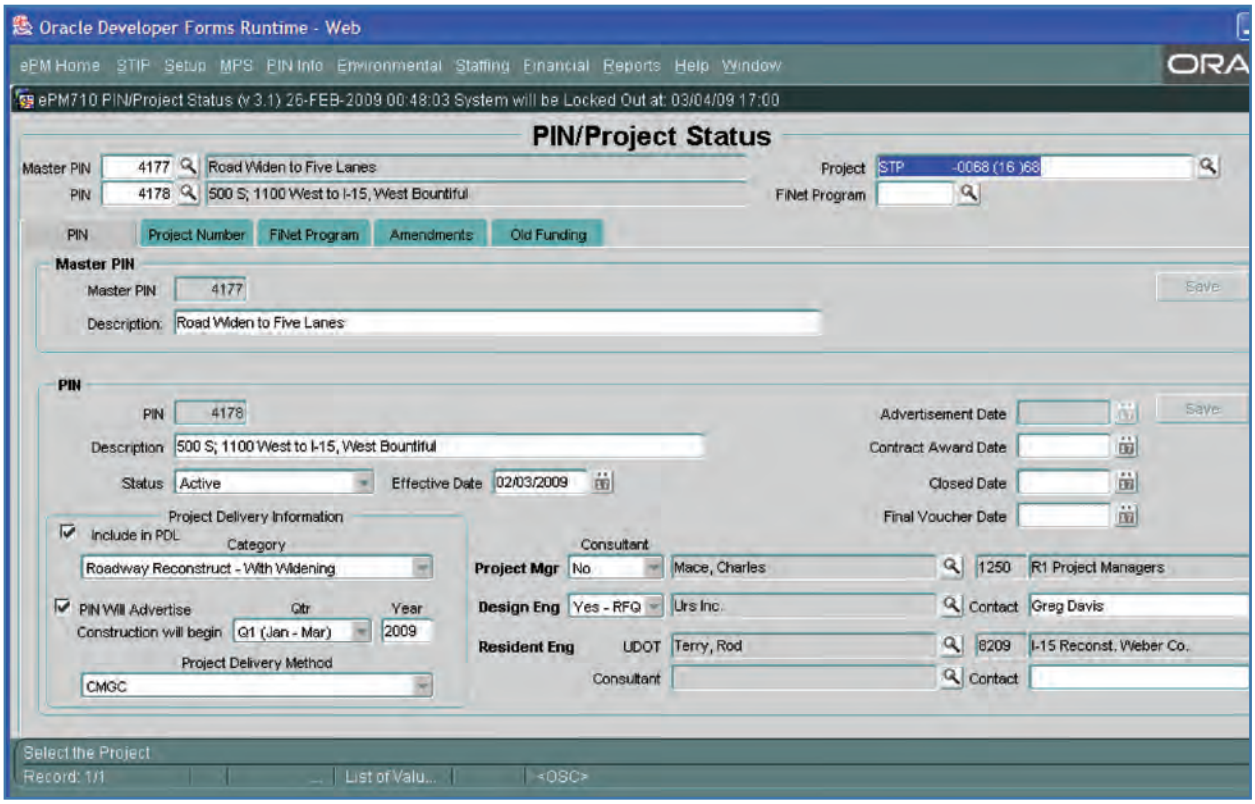

Figure 3.3 *UDOT's ePM Web Site*

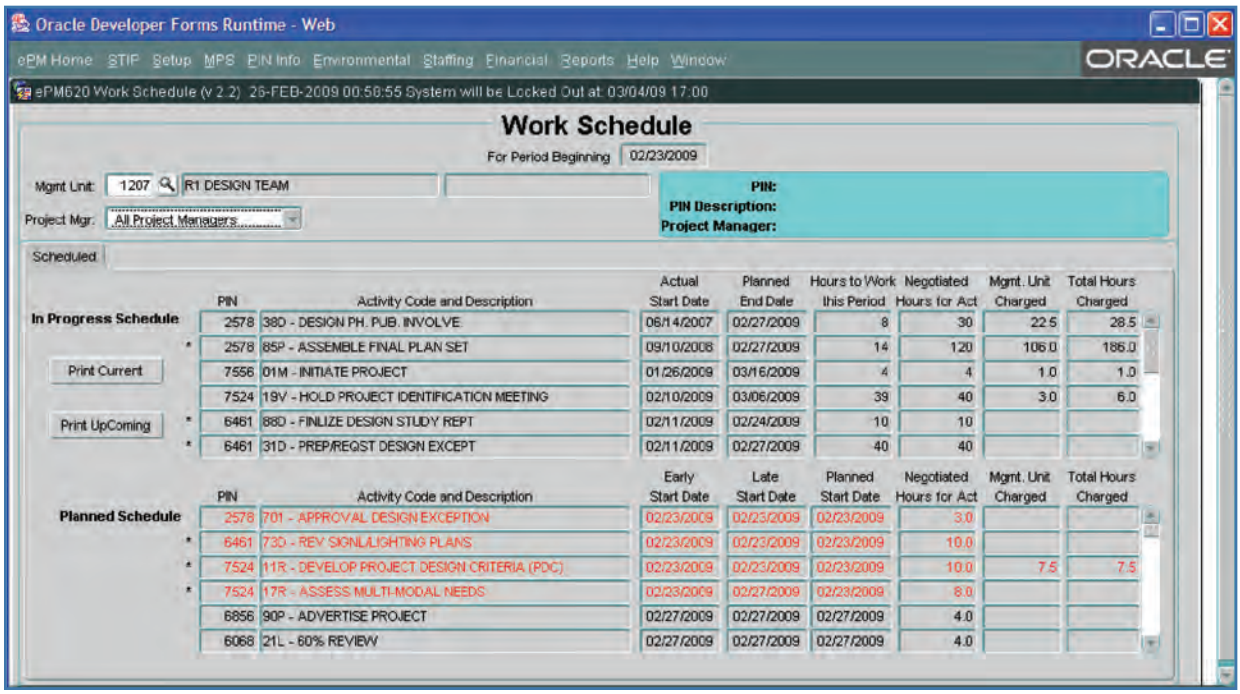

Figure 3.4 *UDOT's ePM Work Schedule Screen*

Shared Leadership

The observed Best Practices in the project management area had strong elements of leadership, which created a positive environment for individuals and organizations. Each state had its own key leadership characteristics, leading to successful implementation of the processes the scan team observed and included in this report. The team realized that effective leadership was not a singular function or attribute of a particular person in any agency, but a shared attribute between many individuals.

Leadership Extends Below the CEO

In some cases a strong leader emerges at the chief executive officer (CEO) level, such as Pete Rahn, director of the Missouri Department of Transportation (MoDOT). To attribute the successful program solely to him, however, ignores many other men and women who exercise important leadership roles at multiple levels. MoDOT's chief engineer, Kevin Keith, and others, play a significant role in the changes occurring in that agency.

Significantly, Wylie Bearup, Acting Street Transportation Director, came to the City of Phoenix with a strong background and extensive experience in project management and, essentially, launched their PM initiative. Doug McDonald and his predecessor, Sid Morrison, led Washington State DOT for many years. Despite neither of them being engineers, under their leadership, project management programs and systems thrived. This is a further testament to the need for leadership at all levels to ensure successful project management practices.

Leaders throughout these host agencies improved accountability within their specific responsibilities. The impacts of a key leader and a series of other leaders in an agency are felt long after one or more have left.

Some common leadership attributes noted by the scan team should be useful and provide context to this element of Best Practice implementation:

- Leaders improve accountability at all levels. Some of this ties in to performance measurement systems and other aspects, for example, making sure people deliver on both internal and external commitments.
- Leaders in these organizations demanded accountability from their managers but were also willing to give them the tools they needed to be successful.

- These Best Practices reflect an absence or near absence of the silo effect present in so many organizations. Leadership's role in removing these barriers was evident.
- Leaders who engaged in the process by asking tough questions, demanding accountability, and staying focused on the ultimate agency 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 seemed crucial to developing and maintaining key relationships with third parties (e.g., 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. They recognize that risk is inherent by its nature in transportation projects but plan how to address these influences. The scan team observed that, at host agencies, managing risks means more than just listing them; instead, risk management involves identification, assessment, quantification, prioritization, and deliberate actions focused on big-picture objectives. These agencies adopted tangible strategies to address risks with a variety of types and impacts. A sampling of how these host agencies addressed project delivery risks follows.

Schedule Impacts Due to the NEPA Process

All the host agencies identified schedule risks inherent in the NEPA process as one of the most difficult to manage. Often the process involves lengthy delays that can occur prior to obtaining clearance. The lack of predictability in the NEPA schedule forces agencies to make schedule decisions accommodating these factors. In several states, projects are not included in the formal plan with delivery dates until the NEPA process is over, which has resulted in fewer violations of public expectations when projects did not emerge on time from NEPA. The agency can then focus attention on schedule performance and meeting customer expectations for project delivery.

For example, in Arizona, scoping efforts are done and documented in a Design Concept Report. Normally, the relevant environmental document is prepared concurrently. Once the Design Concept Report is completed, the project is ready to be considered for inclusion in the STIP.

Cost and Schedule Estimating Risks

WSDOT addresses risks aggressively in the cost estimating function. WSDOT's risk management process is based on the following principles:

- Integral and sound project management
- Encouraged early planning/action
- Revealed threats and opportunities
- Increased understanding
- Greater transparency

Fundamental to the process are the answers to two questions: How much will it cost and how long will it take? WSDOT emphasizes procedures that give them an estimate as a range and not as a single number because it believes that approximately right is better than precisely wrong.

Figure 3.5 graphically represents how WSDOT views risk over the life of a project. As it moves towards construction, the DOT has decreasing ability to address risk in a meaningful and cost-effective way.

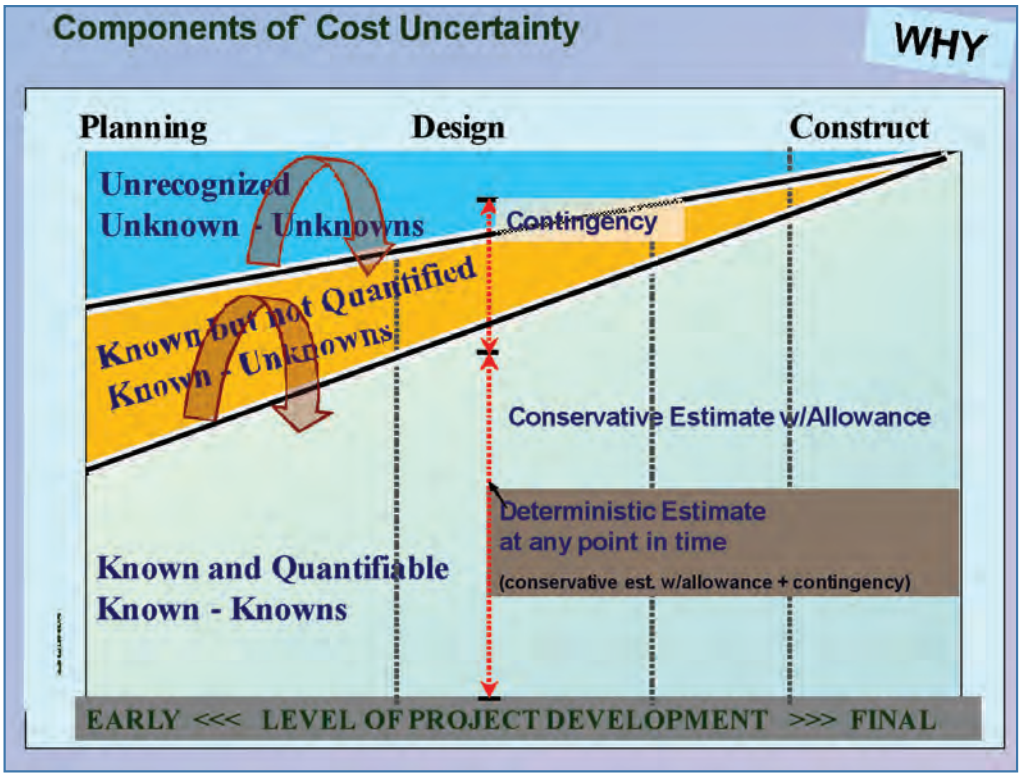

Figure 3.5 *WSDOT Components of Cost Certainty*

Washington has applied tools for assessing and managing risks on projects since 2002. The DOT utilizes a tool called CEVP, which has demonstrably addressed risks and assisted in managing project costs and other factors that ultimately could negatively impact the capital program. It reflects the most rigorous approach used by the agency for assessing and addressing project delivery risks.

CEVP represents a process whereby the PM, team members, and invited specialized experts review the project and the risk elements associated with delivering the work. From this process emerges a series of quantifiable impacts the agency can then use to assess mitigating strategies, ensuring an optimal approach to risk management.

Not all projects go through CEVP. The selected risk assessment process is a function of the project's value and complexity. Table 3.1 breaks down which tools are used for each size of project based on project value.

Project Value	Tool Used
Projects > $10 million	Self-Modeling/Informal Workshop
Projects > $25 million	Cost Risk Assessment (CRA) Workshop
Projects > $100 million	CEVP Workshop

Table 3.1 *WSDOT Tools for Projects Based on Value*

Figure 3.6 shows the utilization history of WSDOT's CRA/Value Engineering (VE), CRA, and CEVP tools since 2002:

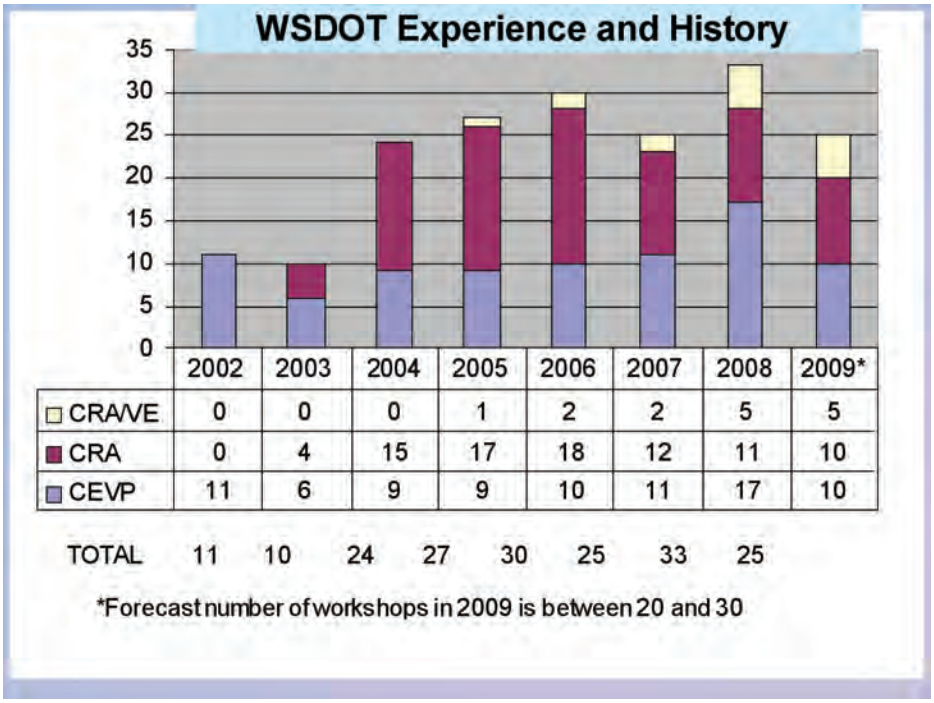

Figure 3.6 *WSDOT Experience and History*

Other state DOTs, including UDOT, have used CEVP with the same measure of success as that found in Washington.

Project Delivery Methods Used to Mitigate Cost and Manage Risks

The City of Phoenix uses a variety of innovative project delivery tools as a strategy to mitigate and manage risk. Using these contract delivery tools they gain advantages in project management practices and also reduce exposure to claims and cost overruns. These tools will be described in greater detail later in this report. However, it is significant that deliberate choices about which tool (e.g., design-build, task order contracting, construction manager at risk, etc.) to use are a major strategy for reducing costs and scheduling risks. The City of Phoenix reports that using Construction Manager at Risk (CMAR) for $3 billion in projects over the last few years has resulted in only one claim. Utah and Arizona report similar results with their use of the CMGC approach and design-build is used by all these agencies as a means of managing cost and schedule risks in project delivery.

Missouri has undertaken a variety of measures to reduce costs and manage its program and project delivery risks. It adopted a program called Radical Cost Control. MoDOT believes that the following three main elements help it achieve Radical Cost Control:

1. Practical Design
2. Maximizing competition
3. Seeking innovation

One of the three foundation elements of the Radical Cost Control program is the practical design initiative. This effort began because MoDOT wanted to build good projects everywhere instead of perfect projects somewhere. Practical design challenges engineers and other project personnel to consider the project circumstances and be practical in their designs. In some cases, bridges have been narrowed to better match the approach roadways or shoulders have been narrowed to better reduce traffic speed on a roadway.

The second element of MoDOT's Radical Cost Control program focuses on maximizing competition. Here the

agency encourages more contractors to compete and allows for differing proposals on materials such as pipe and pavement. MoDOT adheres to the premise that more competition benefits the public.

The final element of this program is seeking innovation. MoDOT promotes innovation and proves it with its approach on the New I-64 Project in St. Louis. This $420 million design-build effort is currently under construction and represents the largest urban freeway reconstruction project in agency history. When creating project specifications, it focused on performance-based language and expectations. In addition, it stunned the industry when it announced that it would allow incorporation of any specification currently in use in another state DOT for this project. While review of these specs from other states has occurred, the effort is reported to be very successful and the contractor has responded well to this new freedom. Project staff report that this approach has not diminished project quality. More information can be found on MoDOT's Web site (http://epg.modot.org/index.php?title=Main_Page). Here the department articulates how it applies these principles to the day-to-day efforts of project delivery.

Use of Consultants

A variety of factors are influencing a trend by public transportation agencies toward greater reliance on using outside engineering firms to deliver projects. This trend yields benefits to these agencies as they are able to obtain critical skills for complex projects, use experienced personnel which they may be lacking, or add manpower to meet capital delivery schedule demands.

The scan team found that each agency visited used outside resources for a variety of tasks and a sizeable portion of work. Utilization rates ranged from a low in Missouri of about 20% to more than 80% in Arizona, Florida, and Utah. The high level of outsourcing reported by these states is a function of historic workload changes. For example, about ten years ago Florida went through a significant increase in program size as part of the governor's economic stimulus program, which was coupled with an initiative focused on substantially decreasing full-time equivalent (FTE) employees.

Arizona passed the first of three half-cent sales tax ballot measures in 1985 and was faced with delivering a growing program with no increases in FTEs. That began a pattern of substantial use of consultants. Ultimately, states across the country find that with diminishing staff levels due to funding cuts and retirement, mounting workloads, and increasingly complex projects, the prospects for continued reliance by state DOTs on consulting professionals remains strong. Using consultants to complement and enhance a DOT's project management process is clearly a Best Practice. The following are some key points:

- Private-sector engineers and their firms are used for a wide variety of activities to meet agency needs. Flexibility in how consultants are used and the skill sets required allowed DOTs to maximize contributions to programs.
- Utah's streamlined consultant selection process was noted for its ability to bring firms into use quickly. It is employed in all phases of the project delivery process and for all skills. More details can be found in Chapter 5.0 in the discussion on innovative contracting practices.
- Florida is the only state utilizing private-sector PMs to manage projects without a state 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 have evaluation procedures in place to assess these firms' performance and their suitability for future work.

Investment in GIS and Data Management Tools

States employing Best Practices in project management also use a variety of technologies to enhance their effectiveness. The scan team recognizes that virtually all levels of transportation agencies use computer-aided drafting and design (CADD) and other readily available technology tools. The states visited by the scan team did not use technology for technology's sake, but found ways to optimize project delivery and management by using

tools they had either procured or developed. This technology leveraging clearly indicates a willingness to employ Best Practices. The following include some important observations:

- The existence of GIS and data management systems was clearly a benefit. The scan team realized that this type of system requires corporate investment, but the ultimate value far exceeds the expense. Each state visited has some form of GIS integrated into delivery processes, which assists PMs and others in managing data elements along with the overall project. It is hard to quantify how this aggregation of information empowers the PM in the decision-making processes, but the states and scan team concur about its value.
- WSDOT's Multi-Agency Permit Team (MAP Team) was established as a means of better communication and working to protect the environment. Co-locating DOT staff and resource agency personnel improves coordination. The MAP Team arose from an interagency charter, established as a commitment by the signatories, affirming the agencies would collaborate productively. Figure 3.7 shows the charter that these five agencies signed in 2003.

The objectives of the MAP Team are as follows:

- Increased permitting predictability
- Increased interagency early project coordination
- Increased interagency accessibility
- Improved interagency relationships
- Effective mitigation

The MAP Team's work can be characterized by a strong emphasis on communication, cooperation, and collaboration. When co-located, team members are better able to facilitate timely discussions that greatly improve permit processing and review. The nine members of the MAP Team meet each week on every project. Figure 3.8 shows the progress the MAP Team has made in timing processing permits, clearly illustrating the positive trend of declining timeframes for permits and decisions. For more information about WSDOT's MAP Team, visit http://www.wsdot.wa.gov/environment/mapteam/default.htm.

Data management initiatives in these states were also integrated with performance measurement and community involvement efforts so that all three benefited. The scan team found that data management systems that feed their project management and delivery processes also provide valuable information to other divisions of these agencies. In Missouri, project-specific information is fed into the Tracker system and then used to communicate important trend and project information to DOT stakeholders. Virginia's Dashboard includes real-time information that the state's PMs use to manage projects. The same information allows accountability to the public, plus the state's communications staff uses the data to share important project-related information with stakeholders.

Multi-Agency

TRANSPORTATION
ENVIRONMENT
NATURAL RESOURCES
Working for Washington

Permitting Team for Transportation

We, the Washington State Departments of Ecology, Fish and Wildlife, Transportation, the United States Army Corps of Engineers, and King County do believe that by working together, in the same location on the same projects, permit and regulatory decision-making for state transportation projects will be improved for all.

Accordingly, we commit to launching this first Multi-Agency Permitting Team (MAP Team) at the Department of Ecology's Northwest Regional Office on this 14th day of October, 2003; and, in so doing, further commit to empowering this first MAP Team with the responsibility to uphold and embrace the public call for:

- ✔ Governmental cooperation, collaboration, creativity, and team work;
- ✔ Streamlined permitting and regulatory decision-making;
- ✔ Effective environmental protection and impact mitigation; and
- ✔ Efficient delivery of transportation improvement projects that balance and are accountable to community, economic, and environmental values.

With our signatures, we enthusiastically declare "open for business" this first MAP Team, pledge our full support, and commit to continuing to work together to achieve the transportation and environmental protection goals that are vitally important to all citizens of the State of Washington.

Doug MacDonald, Secretary, Washington State Department of Transportation — Date 10/14/03

Linda Hoffman, Interim-Director, Washington State Department of Ecology — Date 10/14/03

Jeff Koenings, Director, Washington State Department of Fish and Wildlife — Date 10/14/03

Col. Debra M. Lewis, District Engineer, Seattle District, U.S. Army Corps of Engineers (Acting pursuant to its streamlining activities under Transportation Equity Act for 21st Century) — Date 1/05/04

Stephanie Warden, Director, King County Department of Development and Environmental Services — Date 11-2-04

Figure 3.7 *WSDOT's Multi-Agency Permit Team Charter*

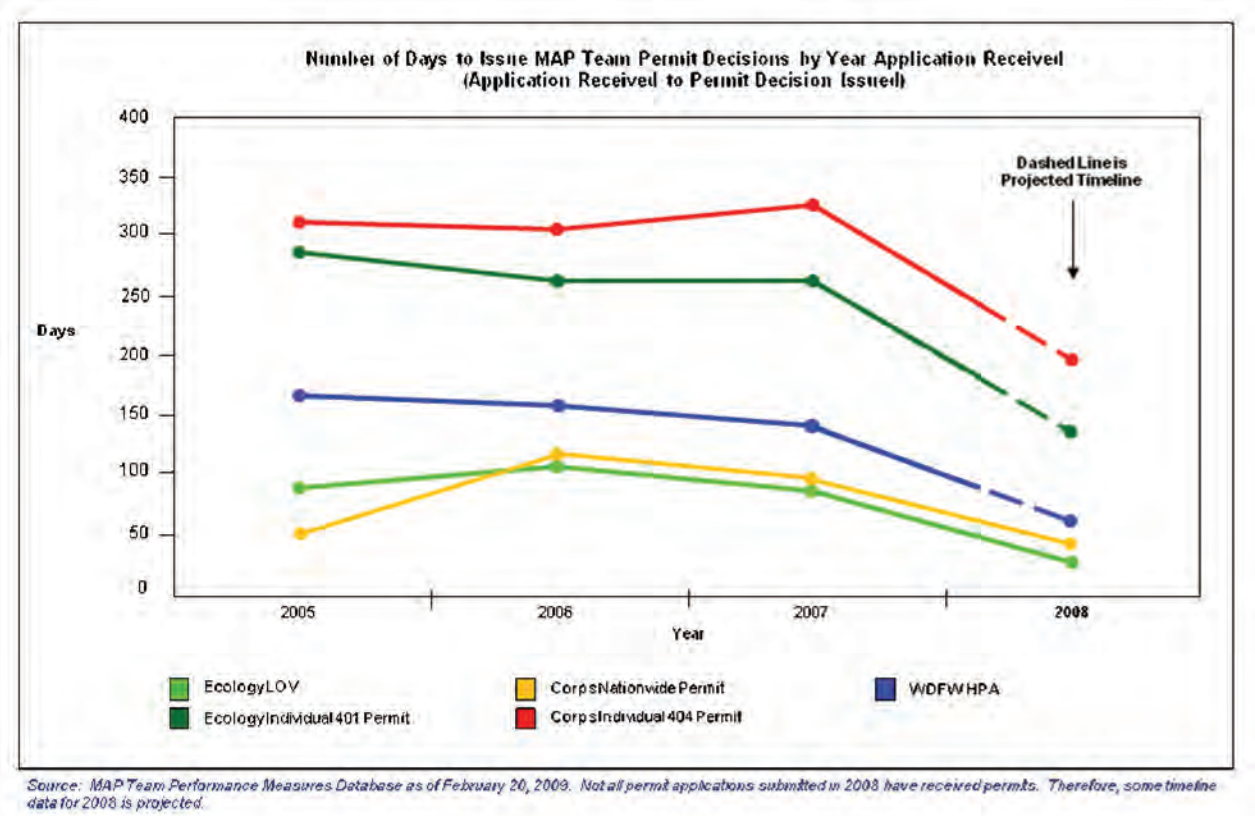

Figure 3.8 *MAP Team Permit Decision Approval Tracking*

Florida's ETDM Process was also identified as a Best Practice for many reasons. ETDM has the goal of moving environmental analysis and transportation decisions through the review process in a timely manner without sacrificing the quality of the natural and human environments. Information materials on ETDM states:

> *"What is ETDM? Florida's Efficient Transportation Decision Making (ETDM) Process is a new way of accomplishing transportation planning and project development for major capacity improvement projects. The ETDM process enables agencies and the public to provide early input to the Florida Department of Transportation (FDOT) and Metropolitan Planning Organizations (MPOs) about potential effects of proposed transportation projects. The goal of ETDM is to make transportation decisions more quickly without sacrificing the quality of the human and natural environments."* [3]

The power of the ETDM Process can only be understood by reviewing the depth and breadth of the information available for each project and by witnessing the collaborative effect it has on stakeholder involvement. Individuals can go to http://etdmpub.fla-etat.org and use the ETDM tool to become knowledgeable and involved.

[3]Florida Department of Transportation, Central Environmental Management Office, ETDM public web site brochure

The site contains general information about ETDM, as well as project-specific information. Each project-specific link has a Project Diary category, whose pages include the following:

- Class of Action
- Community-Desired Features
- Dispute Resolution Activity Log
- Permits
- Project Alternatives
- Project Commitments/Responses
- Project Description
- PMs
- Technical Studies
- Transportation Plan Summary

Another category of information is found under Project Effects. Menu options in this group include the following:

- Agency Comments—Project Effects
- Agency Comments—Purpose and Need
- Community Inventory
- GIS Analysis Results
- Screening Summaries
- Summary Report

Figure 3.9 and Figure 3.10 show some of the Web content of the ETDM Process. FDOT has clearly raised the bar on how it communicates project information and the transparency with which it is done.

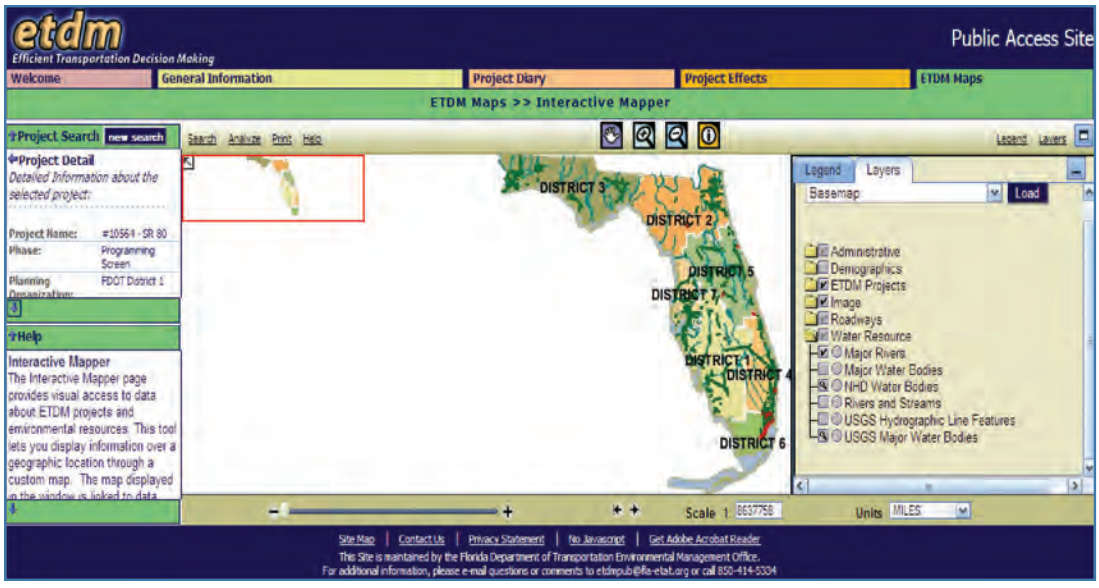

Figure 3.9 *FDOT's ETDM Interactive Map*

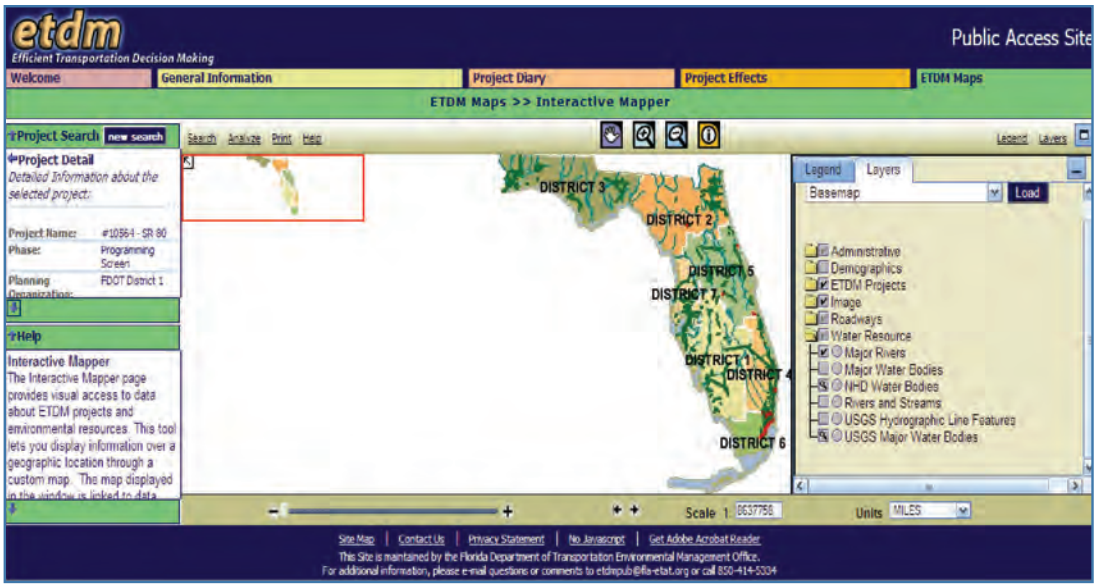

Figure 3.10 *FDOT's ETDM Project-Specific Map*

The ETDM process focuses on making the overall planning and environmental project phases more efficient and more collaborative with stakeholders. FDOT funds employees in the resource agencies to advance decision-making by using the enhanced relationships and communication systems ETDM has in place. FDOT has discovered efficiencies using ETDM because early collaboration tends to focus stakeholders on a narrower set of alternatives based on improved knowledge of project issues. This clarity makes stakeholders more inclined to work with FDOT toward optimal solutions more quickly.

Use of visualization software to produce still images, renderings, 3-D animations, and 360-degree panoramas has grown. The ability to communicate important project information to stakeholder groups this way is well documented. The scanned agencies understood this value and made ample use of it in project delivery practices. Figure 3.11 reflects how UDOT used visualization to share with stakeholders the outcomes of the planned improvements at Hinckley Drive.

As is the case in each chapter of this report, the content presented on Project Management Structure is but a glimpse into what transportation agencies are doing to ensure more effective project delivery.

Maintaining Core Competencies

A universal problem facing the transportation agencies visited by the scan team is the issue of declining core competencies. Outsourcing of engineering services ranged from 20% in Missouri to more than 80% in Utah and Arizona, leaving little opportunity for the development of PMs who have actually done design work for a project. As agencies trend more toward consultant-delivered projects, they are finding that staff are not developing the core competencies they should have to effectively manage the work. Functioning as a contract manager or contracting officer doesn't necessarily give an employee the necessary skill set to oversee a private firm.

The scan team inquired at each site what was being done to address identified critical areas of concern. The most common response was they were trying to get employees to do some project work, but opportunities were limited. 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.

Figure 3.11 *UDOT's Visualization of Hinckley Drive Improvements*

CHAPTER 4

Performance Measurement

A key attribute the scan team was seeking in its search for Best Practices in project delivery management was evidence that a robust and effective performance management system was in place and actively used. Team members assumed that transportation agencies with Best Practices were also likely to have the means and methods for measuring performance. In theory, using these systems gives agency staff the ability to change work processes based on those measurements. Each scanned agency had a form of performance measurement. The scan team believes that this combination of Best Practices in project delivery management and the presence of performance measurement systems reflect the complementary and essential nature of both systems.

Performance Management System

Each state had a performance management system to measure work for internal and, in many cases, external purposes. They differed in genesis, utility, and even the transparency offered to outside sources; however, each contributes to the body of knowledge making up Best Practices in performance management. The basic elements of each system are presented here to highlight individual values.

Arizona

ADOT has long measured performance and reported it to the public; one such long-term effort is the semiannual Life-Cycle Certification report on progress with the Regional Area Road Fund used in Maricopa County for freeway construction. ADOT also uses a variety of project development measures daily to manage the overall program.

Florida

FDOT has a strong internal performance management system used extensively by staff and as a tool for communicating critical information to the Executive Board.

Missouri

MoDOT's Tracker system (Figure 4.1) is a quarterly report chronicling the DOT's progress against many important metrics. The following include several notable attributes:

- It is organized around 18 tangible results.
- It contains approximately 100 individual measures.
- The tools involve senior and midlevel managers.

Tracker was started after Pete Rahn became director of MoDOT. Each district has a version of these performance measures, which are rolled together to create the statewide system. Tracker is available on the agency's Web site (http://www.modot.mo.gov/about/general_info/Tracker.htm). Various versions of the report are available, allowing the user to be specific about which tmeasures to review. In her presentation to the scan team, Mara Campbell, Organizational Results director for MoDOT, noted that, "performance management isn't extra work—it is our work." A similar sentiment was expressed in the other states as they presented performance management systems.

Figure 4.1 *MoDOT Tracker*

Several features of the MoDOT Tracker system are worth mentioning. For example, Director Pete Rahn and his leadership team review Tracker information at quarterly meetings, discussing the different performance measures and presenting actions regarding ways to improve performance. If leaders talk about what they are going to do or are planning to do instead of about what they are actually doing, they risk getting a blast from Pete's air horn as a warning that he is only interested in hearing about action.

Figure 4.2 and Figure 4.3 show various extracts from the Tracker system and offer a glimpse of the available information and how it can be used for agency accountability to the public.

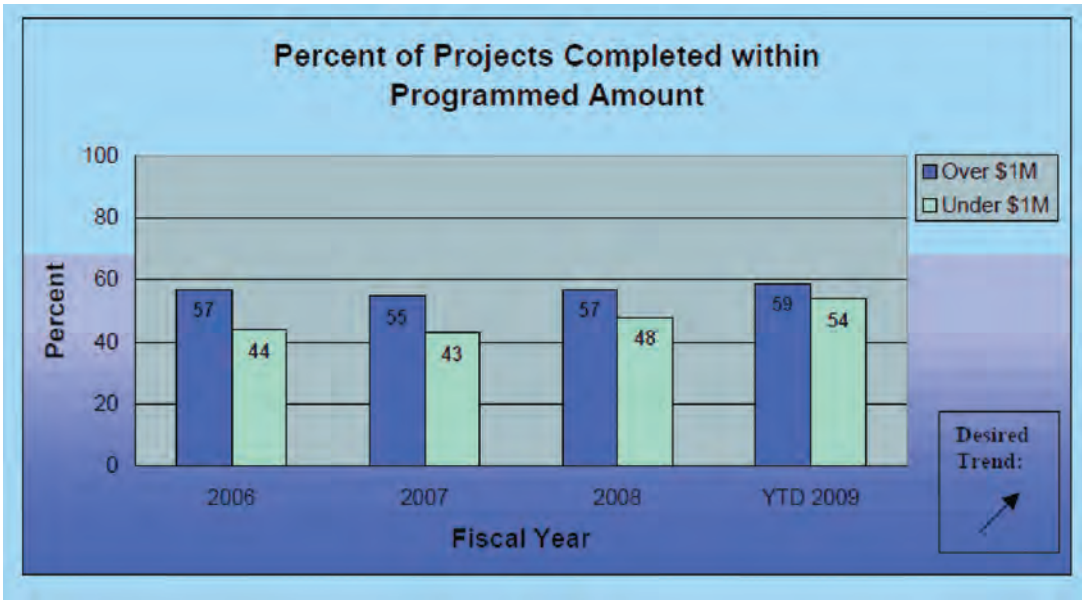

Figure 4.2 *MoDOT Tracker Percent of Projects Completed*

In addition, each Tracker page contains data from a series of supplements that serve as a resource for more detailed analysis of the measure in the larger report. This information is available for internal use. On each page of the Tracker report, a box in the lower right-hand corner illustrates the desired trend for that particular performance measure.

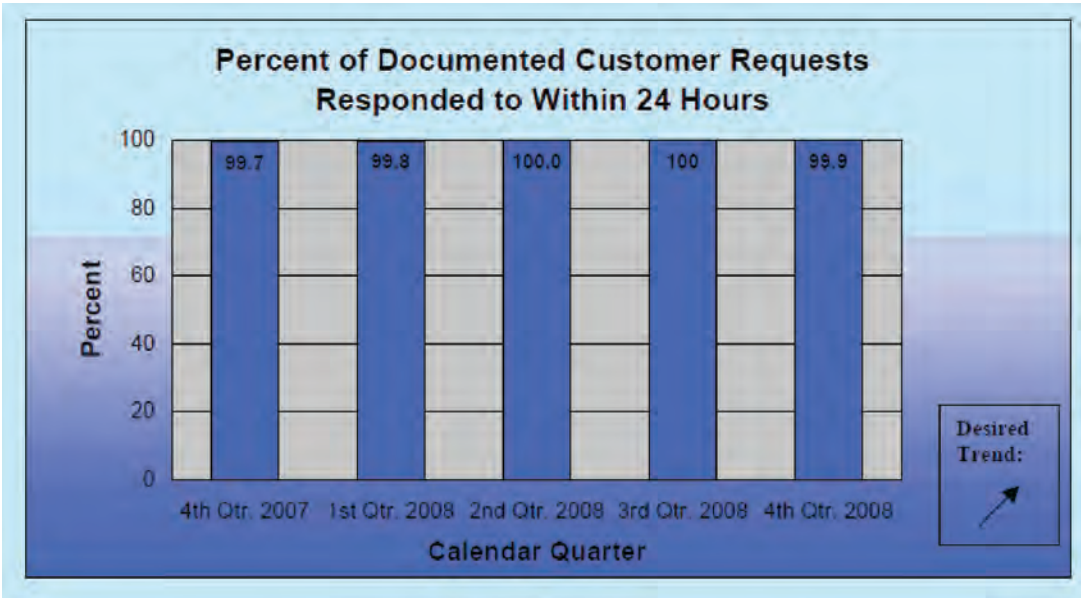

Figure 4.3 *MoDOT Tracker Percent of Documented Customer Requests*

Another area where MoDOT has created a Best Practice is a program that recognizes employee achievements. The Performance Plus program is designed to reward MoDOT employees for going beyond normal duty to increase agency productivity. Nearly all employees have a chance to participate in this innovative process that pays them a fraction of what they save the public through their actions, linking their performance to tangible results. Employees are eligible to earn up to $500 per quarter. Funds for this program are protected from other budgetary issues or developments. The total amount available per year for exceptional performance is $2,000.

Managing the final cost of projects is one way to judge whether employees will receive an incentive through the Performance Plus program. Figure 4.4 reflects project cost growth trends at MoDOT. Before the Performance Plus was implemented, process changes resulted in a 3% to 4% cost growth. This figure shows effective cost growth management, with the ability to still save money while monetarily rewarding employees.

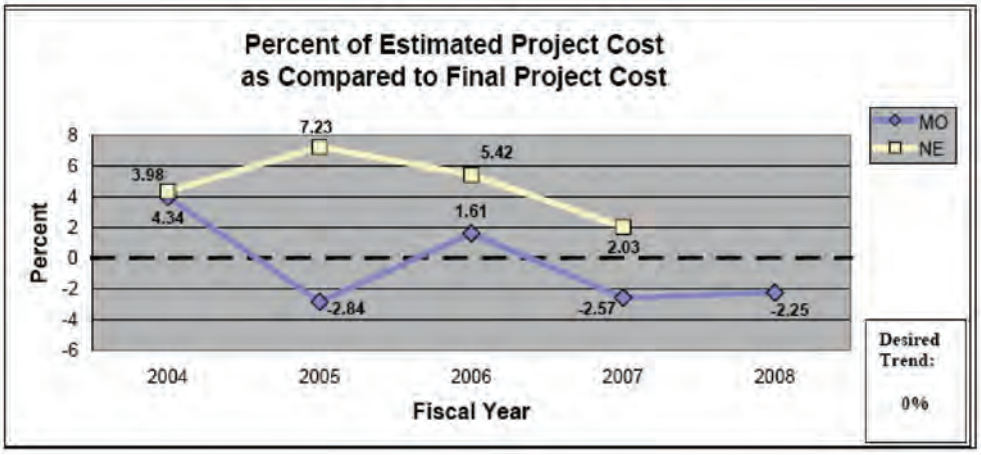

Figure 4.4 *MoDOT Performance Plus Cost Growth Trends (Compared to Nebraska Department of Roads-NE)*

MoDOT is garnering tangible value through performance measurement processes. The agency is respected and project delivery is operating at a level never before achieved.

Virginia

VDOT has a sophisticated performance measurement system that was put in place by former Commissioner Philip A. Shucet. Prior to his arrival at VDOT, no evaluation existed to measure internal agency performance, nor was any effort made to disseminate information to the public.

In establishing VDOT's Dashboard system, Philip sought a means to communicate information in a way the public could understand and would also serve employees as they managed and executed project delivery. He emphasized to employees the need for them to be truthful and used a number of strategies to discourage or prevent them from "gaming" the numbers.

The Dashboard system is a front-end reporting tool that uses information collected nightly from other sources to create the graphs and charts. This data is stored in a data warehouse until incorporated into the Dashboard system. The daily Dashboard updating makes this system the most responsive of all the states visited by the scan team. It offers as close to a real-time view of the agency's performance as possible.

In the beginning, VDOT didn't worry about the quality of the data going into the system—it had a system it hoped would eventually achieve quality goals. In the original versions of the Dashboard, only about 15% of the data was good; however, within three months that number improved to 85%.

Among the lessons learned from the Dashboard system is the importance of setting performance targets or goals and resisting the temptation to adjust them. Setting a baseline gives the agency a standard against which to judge; constant adjustment only confuses the public and those in the project delivery process.

An interesting feature of the Dashboard is that the name of an agency champion and that person's e-mail address is attached to each dial or graph so that internal and external system users have direct access to that person. VDOT personnel observed that this willingness to be open and accessible gained them credit with the system users but didn't result in an overwhelming number of contacts.

The complete Dashboard system can be viewed at http://dashboard.virginiadot.org/default.aspx. Figure 4.5 through Figure 4.9 present some of the Dashboard information to illustrate the power of this system and its ease of use.

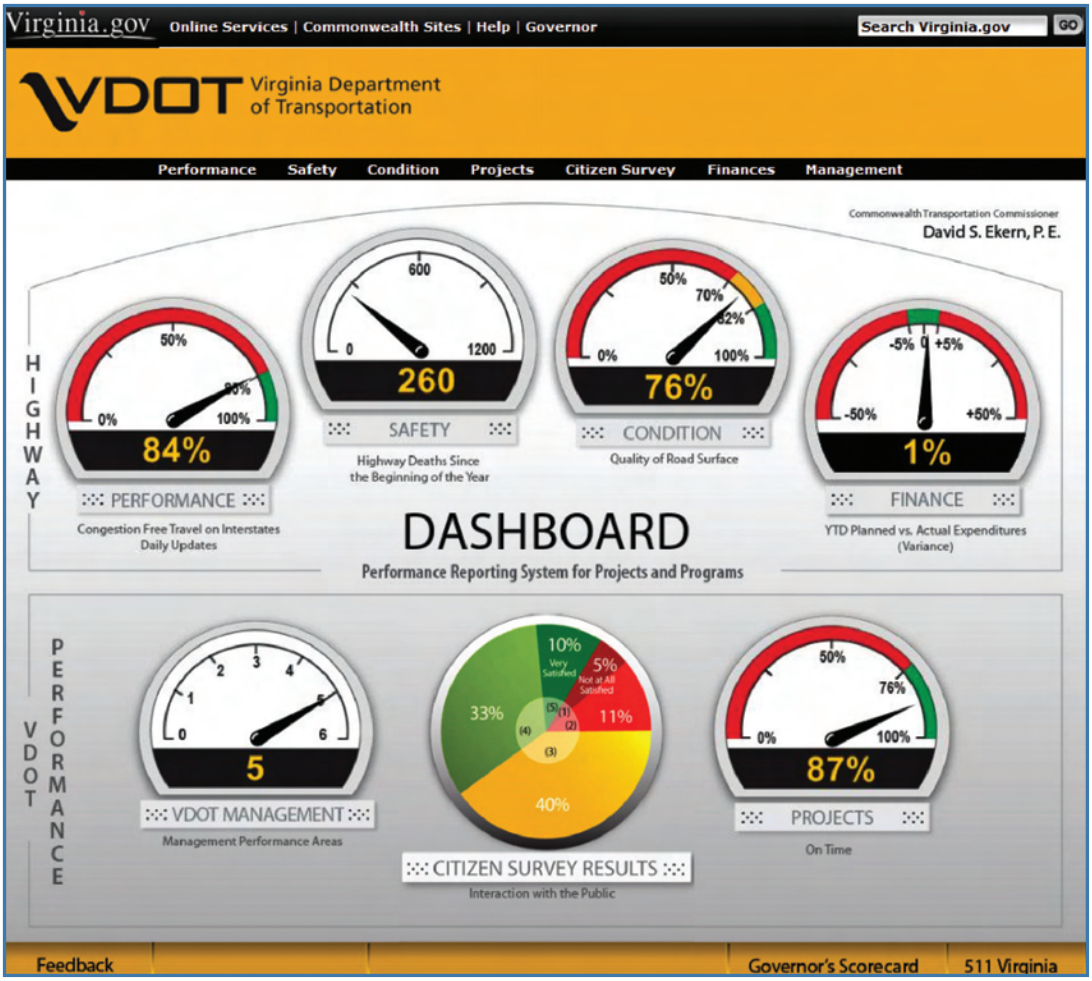

Figure 4.5 *VDOT Dashboard Main Page*

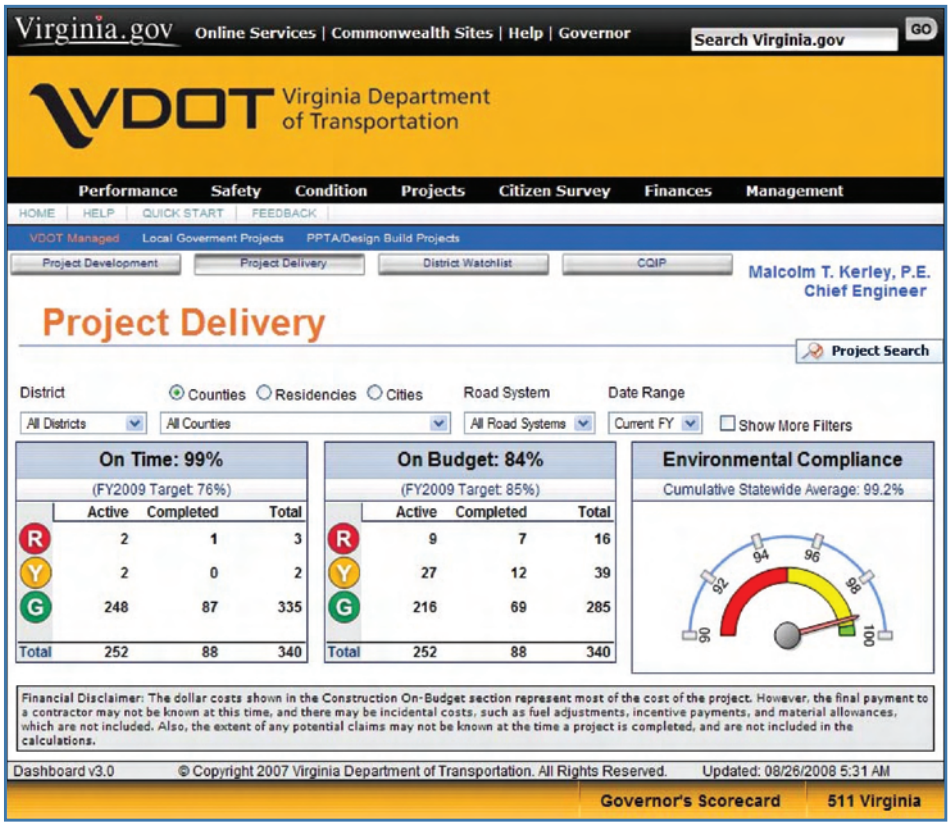

Figure 4.6 *VDOT Dashboard Project Delivery*

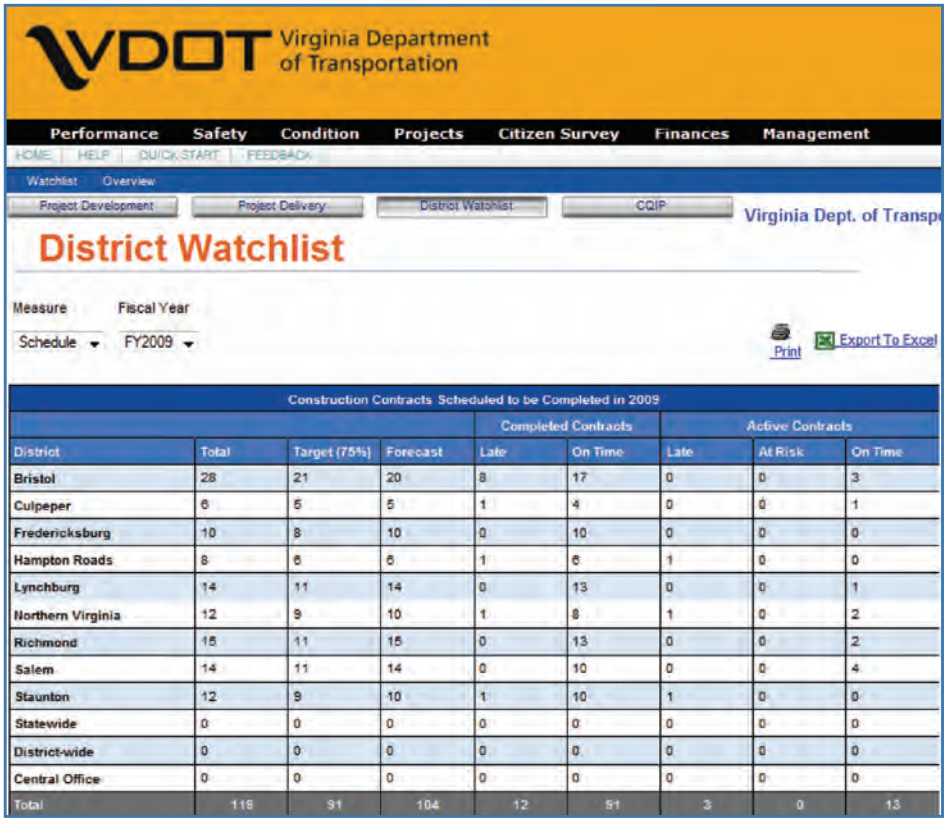

Figure 4.7 *VDOT Dashboard Watchlist*

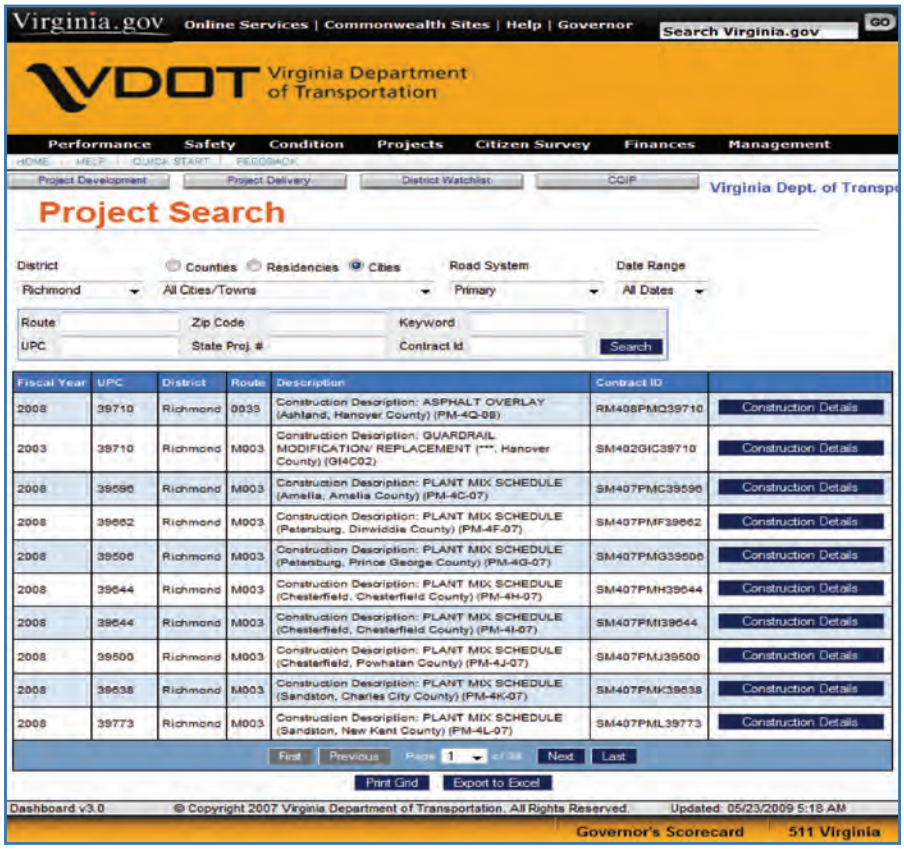

Figure 4.8 *VDOT Dashboard Project Search*

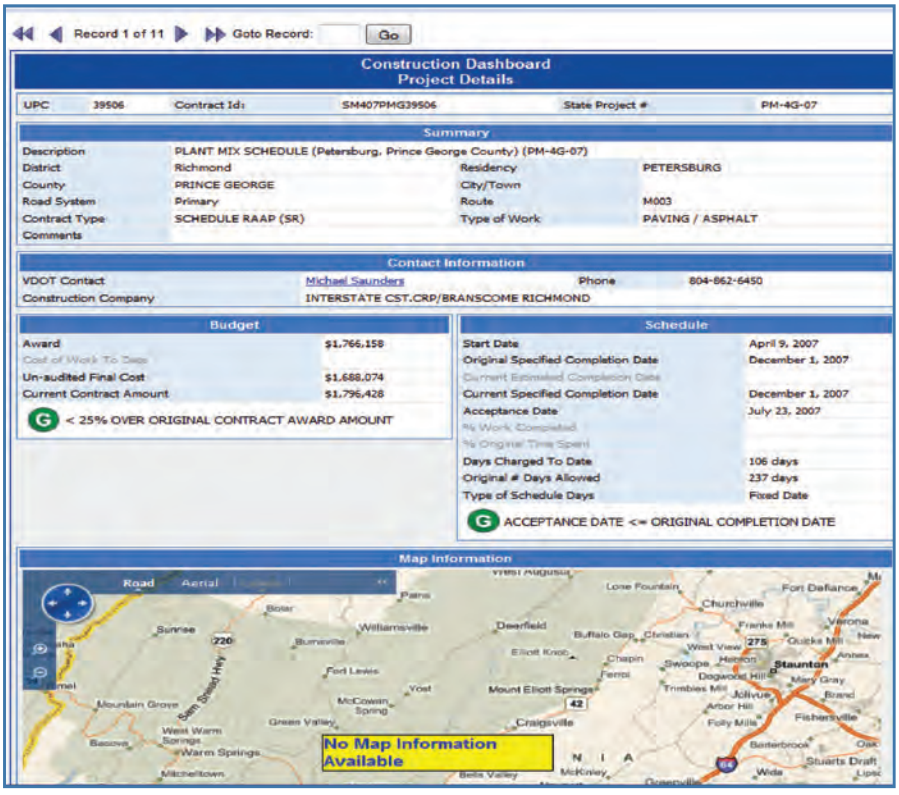

Figure 4.9 *VDOT Dashboard Project Details*

Washington

WSDOT is another agency that has gone to great lengths to improve communication with the public. Its approach to keeping the public informed is found in a quarterly publication called The Gray Notebook (Figure 4.10). It has many of the same measurement and performance information found in MoDOT's Tracker system. The Gray Notebook is divided into five sections that are further subdivided to provide additional information. The five sections include the follwing:

- Safety
- Preservation
- Mobility (Congestion Relief)
- Environment
- Stewardship

Originally, *The Gray Notebook* was only 12 pages long; today it has grown to over 100. The full report is available at: http://www.wsdot.wa.gov/Accountability/GrayNotebook/ navigateGNB.htm. Multiple versions of *The Gray Notebook* can be downloaded by following the links. Figure 4-11 through Figure 4-13 give examples of the detailed content available in this publication.

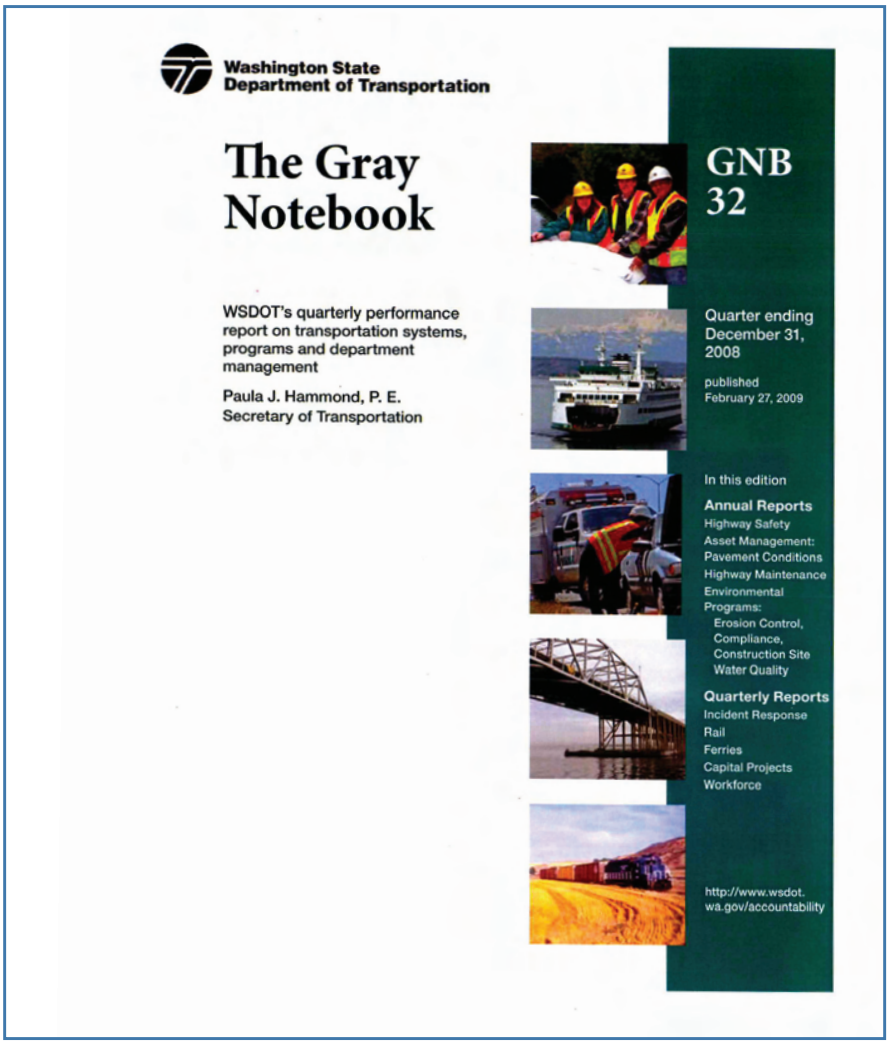

Figure 4.10 *WSDOT The Gray Notebook*

Performance Dashboard

Data as of December 31, 2008

✓ Goal has been met. ↑ Performance is trending in a favorable direction. ↔ Trend is holding. ↓ Performance is trending in a unfavorable direction.

Policy goal/Performance measure	Previous reporting period	Current reporting period	Goal	Goal met	Progress	Comments
Safety						
Number of **traffic fatalities** per 100 million vehicle miles traveled (VMT) in Washington State (annual measure, calendar years 2006 & 2007)	1.12	1.0	1.0	✓	↑	Working toward additional reductions through *Target Zero*
Yearly **OSHA-recordable injury and illness rate** per 100 WSDOT maintenance & engineering workers (annualized: FY08 Q4, FY09 Q1[6])	4.2	4.9	6.0	✓	↓	Continuing to aggressively improve worker safety despite recent rise in annualized OSHA injury and illness rate
Preservation						
Percentage of state **highway pavements** in fair or better condition (annual measure, calendar years 2006 & 2007)	93.5%	93.3%	90.0%	✓	↔	Performance level exceeds goal - challenges ahead
Percentage of **state bridges** in fair or better condition (annual measure, calendar years 2006 & 2007)	97.4%	97.0%	97.0%	✓	↔	Performance level meets goal - trending downward
Mobility (Congestion Relief)						
Average clearance times for **major (90+ minute) incidents** on key Puget Sound corridors (quarterly: FY08 Q4, FY09 Q1[6])	147 minutes	156 minutes	5% reduction	---	↓	High numbers of extraordinary incidents (6 hr. +) affected the quarterly response average
Percentage of **Washington State Ferries** trips departing on-time[2] (quarterly: FY08 Q4, FY09 Q1[6])	87%	95%	90%	✓	↑	Quarterly performance improved over previous quarter
Percentage of **Amtrak *Cascades*** trips arriving on-time[3] (quarterly: FY08 Q4, FY09 Q1[6])	61%	69%	80%	---	↑	Performance is continuing to improve
Annual weekday **hours of delay** statewide on highways compared to maximum throughput (51 MPH)[1] in thousands of hours (annual measure, calendar years 2006 & 2007)	23,330	25,490	N/A	---	↓	Growth in delay slowed from 35% to 8% between 2005 and 2007's recorded delay hours
Environment						
Cumulative number of WSDOT **stormwater treatment facilities** constructed or retrofitted[4] (annual measure, calendar years 2006 & 2007)	809	850	N/A	---	↑	New stormwater facilities permit will expand WSDOT's responsibilities
Cumulative number of WSDOT **fish passage barrier improvements** constructed since 1990 (annual measure, calendar years 2006 & 2007)	205	218	N/A	---	↑	More then 400 linear miles of habitat restored (estimated)
Stewardship						
Cummulative number of Nickel and TPA **projects delivered, and percentage of on-time and on-budget delivery performance** (quarterly: FY08 Q4, FY09 Q1[6])	167/ 78%	185/ 79%	90% on-time and on-budget	---	↑	On-time and on-budget delivery performance improved over last quarter despite challenges.
Variance of total project costs compared to **Legislative budget expectations**[5] (quarterly: FY08 Q4, FY09 Q1[6])	0%	0%	0%	✓	↑	Overall program delivered under budget
Percentage of **completed contracts** final costs within 10% of the original award amount (annual measure, state fiscal years 2007 & 2008[6])	80.1%	85.5%	100%	---	↑	Performance has improved with better estimates and contract documentation

[1] 'Maximum throughput' is defined as the optimal traveling speed, where the greatest number of drivers can occupy the highway at the same time; usually measured as 51 MPH. The data represents the year prior to the year in which it was reported.
[2] 'On-time' departures for Washington State Ferries includes any trip recorded by the automated tracking system as leaving the terminal within 10 minutes of the scheduled departure time.
[3] 'On-time' arrivals for Amtrak *Cascades* are any trips that arrive at their destination within 10 minutes or less of the scheduled time.
[4] Facilities in Clark, King, Pierce, and Snohomish counties.
[5] Budget expectations are the figures established by the Legislature annually for major projects under construction.
[6] WSDOT's fiscal year begins on July 1 and ends on June 30. There are eight fiscal quarters in the biennium, and are organized as follows: Quarters 1 & 5: July 1 - September 30, Quarters 2 & 6: October 1 - December 31, Quarters 3 & 7: January 1 - March 31, Quarters 4 & 8: April 1 - June 30

Figure 4.11 *WSDOT The Gray Notebook Performance Dashboard*

National Environmental Policy Act Annual Report

Environmental Assessment processing times reduced by 40%

A total of 23 environmental assessments (EA) were initiated between January 1999 and September 2003 have been completed with processing times ranging from 23 to 98 months, with a median processing time of 42 months, which is 30 months longer than the national goal of 12 months.

Since the national goal began in October 2003, WSDOT has initiated 24 EAs. While the processing time for twelve completed EAs is exceeding the national 12 month target processing time, WSDOT has reduced its median to an average of 25 months, a 40% decrease compared to the median processing time for the EAs initiated prior to the national goal. Ten incomplete EAs are in various stages of development and were initiated between two months and five years ago. Two projects have been put on hold or shelved.

Study of EA delays nearly complete

WSDOT is examining all of the reasons associated with processing delays for EAs. The 21 environmental assessments started over a five-year period that have taken 12 or more months to complete are being analyzed. Detailed results of the investigation are scheduled for release in the March 31, 2009, *Gray Notebook*.

Duration of processing times for environmental assessments

Number of months per individual project, 2003-2008, National goal is for processing times

Data Source: WSDOT Environmental Services

Figure 4.12 *WSDOT The Gray Notebook Environmental Documentation*

WSDOT's Capital Project Delivery Programs

Highway Construction Performance Dashboard

Each quarter, WSDOT provides a detailed update on the delivery of the highway capital programs in the *Gray Notebook* and on the web (at www.wsdot.wa.gov) through the Project Pages and Quarterly Project Reports. The *Gray Notebook*'s Beige Pages generally do not include planning studies or projects that do not have a construction phase. Pre-Existing Funds (PEF) projects are budgeted by program for the improvement and preservation of the highway system, and the delivery of the work is reported programmatically in six categories.

Each of the 153 Nickel and 238 TPA projects has a line item budget, and are reported at an individual project level. Budgets for PEF, Nickel, and TPA in this edition of the *Gray Notebook* are based on the 2008 Supplemental Budget.

Highway construction performance dashboard *Dollars in thousands*	**Nickel (2003)**	**TPA (2005)**	**Combined Nickel & TPA**	**Pre-Existing Funds (PEF)**
Total number of projects	153	238	391	752
Total program budget *	$3,946,466	$9,415,872	$13,362,338	$4,285,911
Schedule, Scope, and Budget Summary: Results of completed projects				
Cumulative to date, 2003 – December 31, 2008	For Nickel and TPA details, see pages 51-57			See pages 93-96
Total cumulative number of projects completed	**108**	**77**	**185**	
% Completed early or on time	89%	91%	90%	
% Completed within scope	100%	100%	100%	
% Completed under or on budget	91%	83%	88%	
% Completed on time and on budget	82%	74%	79%	
Baseline estimated cost at completion	$1,699,976	$244,043	$1,944,019	
Current estimated cost at completion	**$1,700,034**	**$237,328**	**$1,937,362**	
% of total program over or under budget	0.0% over	2.8% under	0.3% under	
Biennium to date, 2007-09				
Total biennium number of projects completed	**39**	**54**	**93**	**281**
% Completed early or on time	85%	91%	88%	-
% Completed within scope	100%	100%	100%	-
% Completed under or on budget	90%	87%	88%	-
% Completed on time and on budget	79%	78%	78%	-
Baseline estimated cost at completion	$946,073	$229,124	$1,175,197	$1,568,364
Current estimated cost at completion	$945,376	$222,614	$1,167,990	$1,576,622
Advertisement Record: Results of projects entering into the construction phase or under construction				
Cumulative to date, 2003 – December 31, 2008	For Nickel and TPA details, see pages 59-62			See pages 93-96
Total number of projects in construction phase	**18**	**42**	**60**	**N/A**
% Advertised early or on time	83%	90%	88%	-
Total award amounts to date	$577,298	$724,059	$1,301,357	-
Biennium to date, 2007-09				
Total advertised	12	33	45	164
% Advertised early or on time	92%	91%	91%	95%
Total award amounts to date	$308,737	$273,907	$582,644	N/A
Advertisement Schedule for projects in the pipeline: Results of projects now being advertised for construction or planned to be advertised				
January 1, 2009 through June 30, 2009	For Nickel and TPA details, see pages 63-65			See pages 96-97
Total projects being advertised for construction bids	**3**	**31**	**34**	**82**
% on or better than schedule	100%	68%	71%	-

Data Source: WSDOT Project Control & Reporting. * per 2005-2007 Transportation Budget, Section 603.

Strategic goal: Stewardship – Capital Project Delivery Programs

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Figure 4.13 *WSDOT The Gray Notebook Construction Performance Dashboard*

Through a series of Web pages on its individual projects, WSDOT moves performance measurement from the strategic level to a tactical look at how the agency is performing. Figure 4-14 is typical of available project-specific Web pages that communicate substantial information to the public—all with the intent of being accountable and open about the agency's performance.

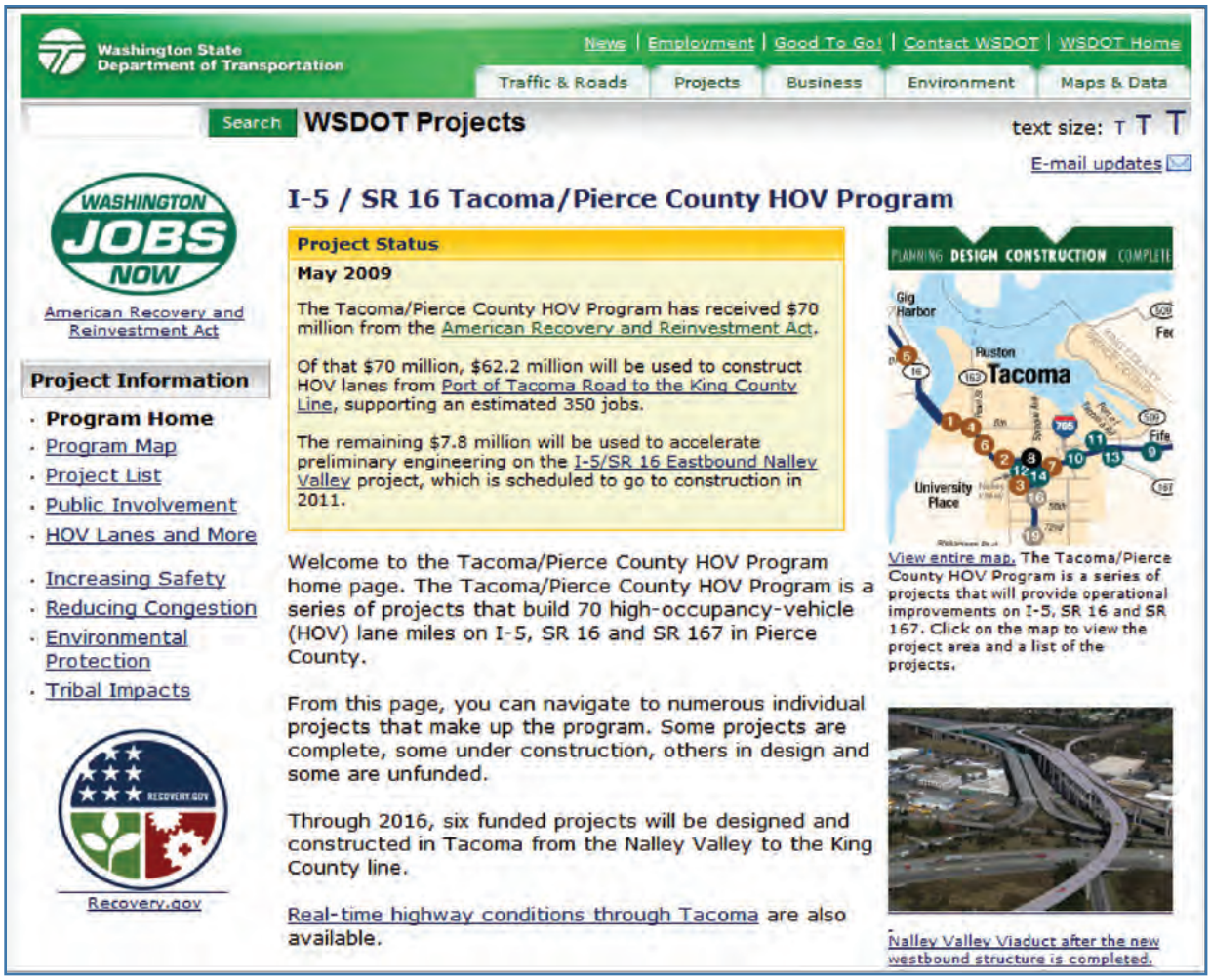


Figure 4.14 *WSDOT Project-Specific Web Page*

Three other DOTs (i.e., Florida, Arizona, and Utah) have effective performance measurement systems in place as a tool for project delivery staff use. These systems are not accessible to the public as are VDOT's Dashboard, MoDOT's Tracker, and WSDOT's *The Gray Notebook*. A brief summary of these systems is provided because they represent Best Practices in their own right.

FDOT manages project-related information through a variety of management systems. Each month FDOT's Executive Board meets for a briefing on agency performance in many different areas. While the report presented to the Executive Board would technically be considered a public document since it is provided in an open meeting, the agency does not publish its content on the Web nor make it publicly available. The scan team was given a copy of the February 2009 report and reviewed its content for this scan.

The Executive Board report contains substantial performance information reflecting many aspects of FDOT's project delivery process, including performance details in the following areas:

- Monthly bid analysis
- Statewide contract lettings
- Project status reports
- Construction cost indicators
- Salary projections and operating budget
- Disadvantaged business enterprise reports
- Personnel report
- Cash forecast and performance report

The Arizona DOT uses a series of performance measurement systems that reflect the agency's desire to manage processes and improve business practices. It primarily focuses on assisting PMs and senior executives in monitoring agency and project performance, rather than seeking greater openness with the public. Examples of ADOT's performance measurement systems are shown in Figure 4-15 and Figure 4-16.

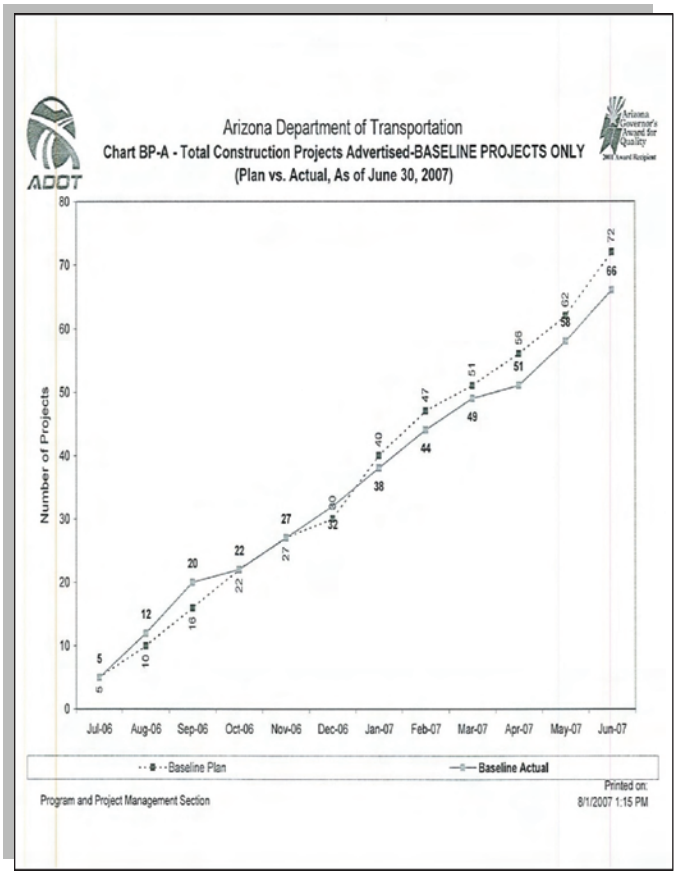


Figure 4.15 *ADOT Construction Project Tracking*

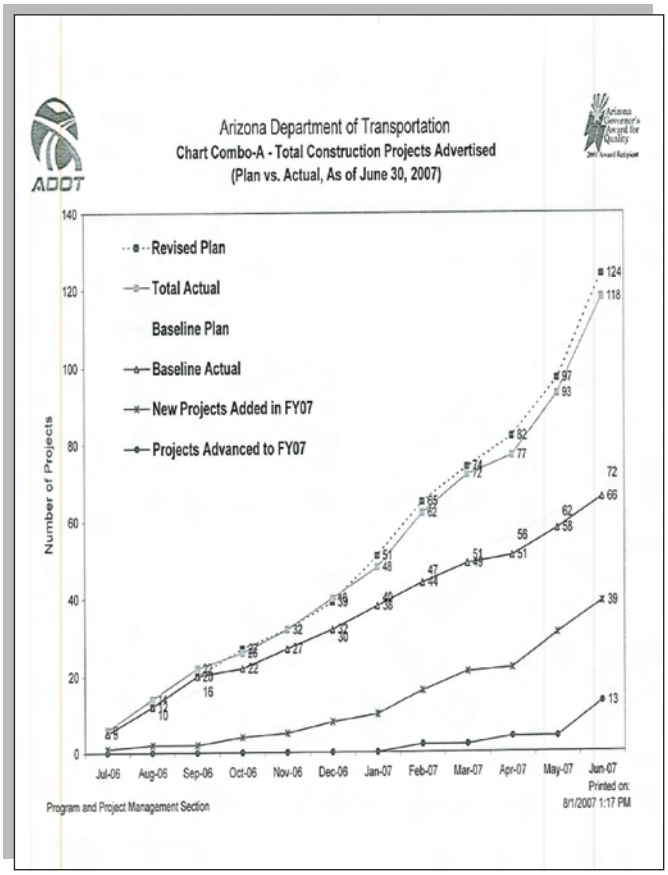


Figure 4.16 *ADOT Construction Projects Advertised*

Utah

Utah has an excellent performance management system called ePM, which tracks many elements of the project delivery process, including schedule and finance. Utah's system, while effective and useful for internal agency purposes, is not accessible to the public.

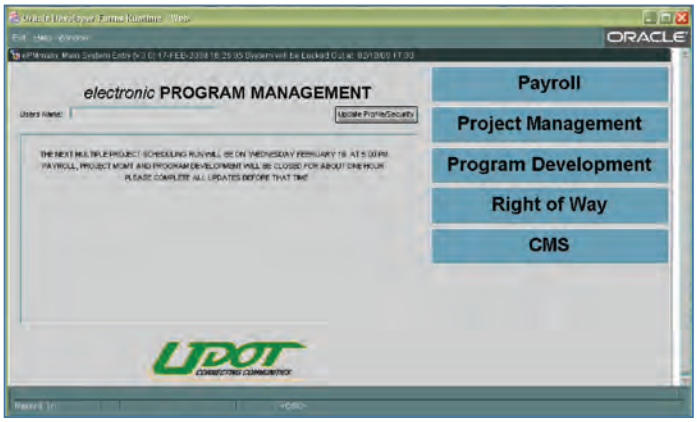


Figure 4.17 UDOT Electronic Program Management

ePM was developed by UDOT to provide management and PMs with the tools needed to effectively manage projects. The scan team observed that ePM was the strongest of the internal tools viewed during the Best Practices review. Team members also noted that it was probably the most efficient system in terms of the level of

effort expended by the PMs and other agency staff for what they received in return.

ePM is an Oracle-based product using the planning, concept/environmental, and design phases to collect project data for planning, managing, customer service, and trending purposes. Data presented in ePM is gathered from existing systems within the UDOT project development process. Figure 4.17 shows the breakdown of modules available in ePM.

During the construction phase, UDOT uses another Oracle-based system, Project Development Business System (PDBS), which was developed in-house. This system captures salient construction information to assist project staff and management in the oversight work of this critical phase.

UDOT adopted a series of performance measures that are reported in what it calls its Project Delivery Dashboard. The dashboard utilizes information found in both ePM and PDBS and aggregates it into easily understood gauges and charts. Figure 4.18 and Figure 4.19 show a sampling of charts available for UDOT's internal use.

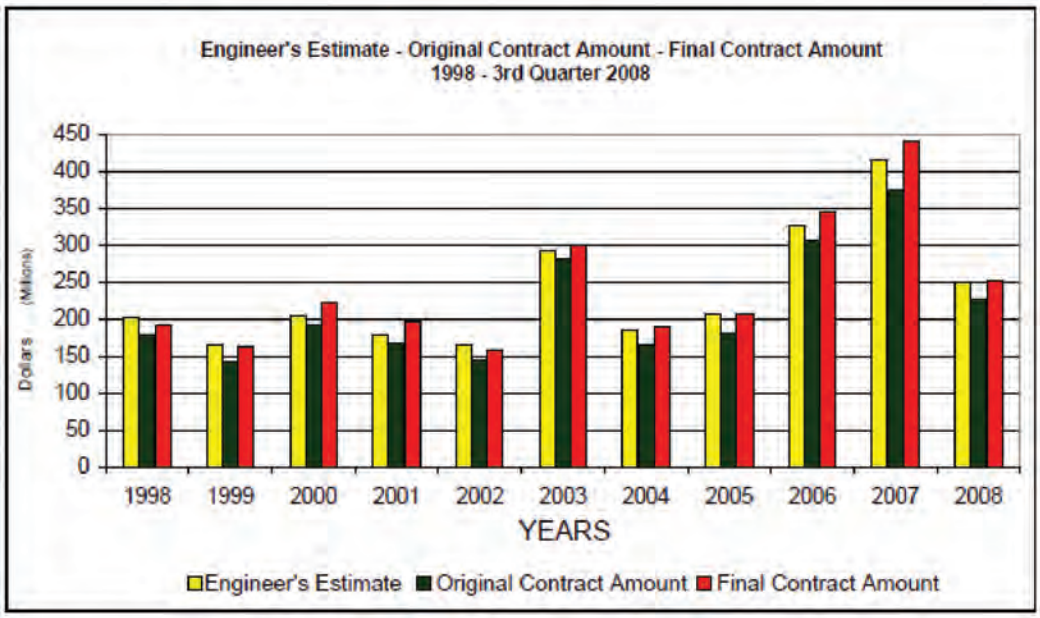
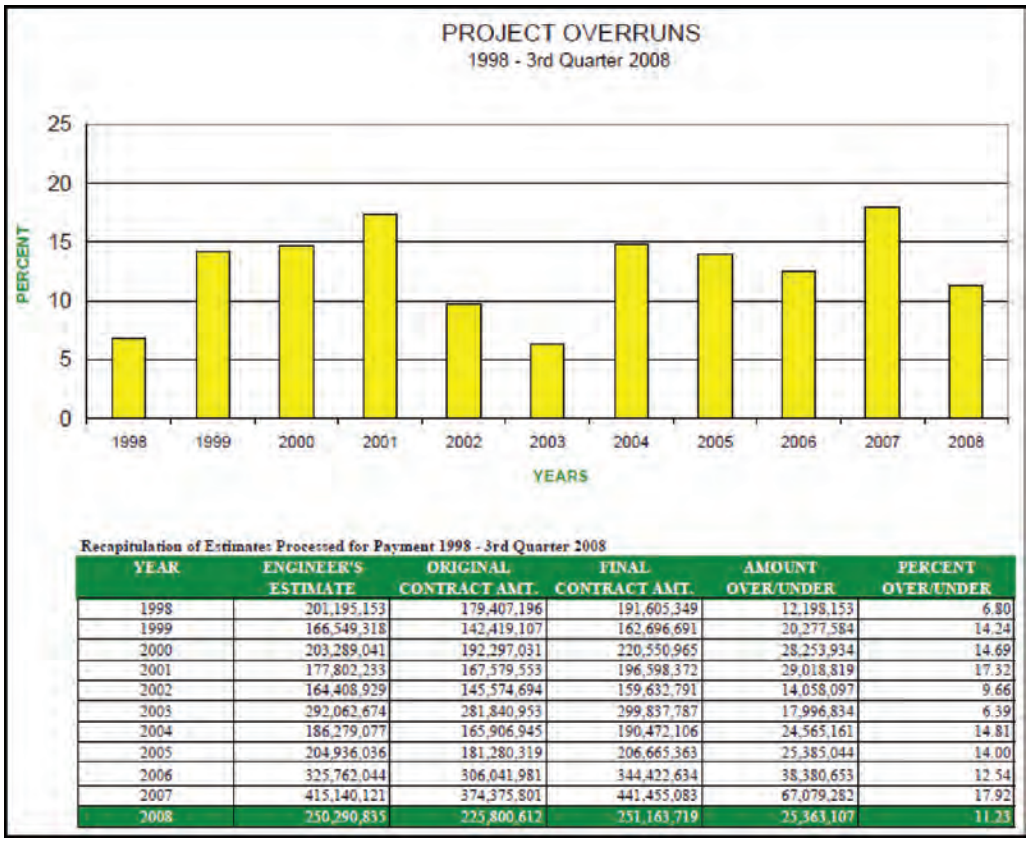


Figure 4.18 *UDOT Construction Engineer's Estimate Comparison*



Recapitulation of Estimates Processed for Payment 1998 - 3rd Quarter 2008

YEAR	ENGINEER'S ESTIMATE	ORIGINAL CONTRACT AMT.	FINAL CONTRACT AMT.	AMOUNT OVER/UNDER	PERCENT OVER/UNDER
1998	201,195,153	179,407,196	191,605,349	12,198,153	6.80
1999	166,549,318	142,419,107	162,696,691	20,277,584	14.24
2000	203,289,041	192,297,031	220,550,965	28,253,934	14.69
2001	177,802,233	167,579,553	196,598,372	29,018,819	17.32
2002	164,408,929	145,574,694	159,632,791	14,058,097	9.66
2003	292,062,674	281,840,953	299,837,787	17,996,834	6.39
2004	186,279,077	165,906,945	190,472,106	24,565,161	14.81
2005	204,936,036	181,280,319	206,665,363	25,385,044	14.00
2006	325,762,044	306,041,981	344,422,634	38,380,653	12.54
2007	415,140,121	374,375,801	441,455,083	67,079,282	17.92
2008	250,290,835	225,800,612	251,163,719	25,363,107	11.23

Figure 4.19 *UDOT Construction Project Overruns*

All the performance measurement systems the team observed are significant and would be of use to other transportation agencies. In addition to the information provided previously about these systems, the following points explain why they were Best Practices:

- VDOT has found that what gets measured gets done.
- Similarly, MoDOT found that when it's measured it becomes important to your agency.
- Some of the observed systems require substantial work to sustain. It goes beyond IT support and includes the effort required to feed data into the system so that it can be aggregated and reported. While the scan team did not do a quantitative assessment of these requirements, it appears that Washington's system is the most demanding in terms of data input, followed by Missouri's. Linea Laird, WSDOT's Construction engineer, noted that the agency receives far more in benefits from *The Gray Notebook* system than it costs to sustain reporting requirements. This vision of the benefits the agencies receive reaches beyond the immediate cost of data input and influences them to invest substantially in these systems.
- Common to each system is the agency's desire for accountability, for the ability to measure and then improve performance, and the recognition that greater transparency is good for achieving ultimate transportation objectives.
- Agencies performing well do not fear openness.
- Each system grew from the influence of strong leaders who felt the need to create a tool to help them with project delivery and in serving the public.
- Metrics used in these systems provided Arizona, Utah, and Washington a means to measure contractor and consultant performance, which could then be used for other purposes by the agencies (e.g., selection for other work).

Contemporary Public Accountability

As noted in the previous section, some of the performance management systems the scan team observed provided a public view of the various agencies. In fact, Virginia, Missouri, and Washington are all open in sharing information of all types with the public. This real-time view into critical metrics has raised the bar for public communication and information access and sets these agencies apart from many of their peers. Many aspects of these systems are recorded in this report. Advice from these agencies for others contemplating implementation of such systems includes the following:

- Gear them toward what the public wants to see and not what the agency thinks is important.
- Obtain agreement early regarding the baseline measurements and defining business rules (e.g., what constitutes on-time or on-budget) and how the information will be used.
- The systems need to be sustainable and maintainable. The Best Practices were agency-wide in application, not limited to a single project or district.
- The most impressive systems used existing data or information that was normally generated as opposed to creating more work for PMs or others. Creating a data warehouse that fed the ePM system in Utah was key to the overall breadth and depth of that tool.
- Make sure the system is a tool, not a task.
- A top-driven approach will likely net a quicker outcome or system than a collaborative initiative. It might be good to start with a committee, but a directive effort may be required if the committee is unable to produce a system in a timely manner.

CHAPTER 5

Contracting Practices

The scan team found that each agency visited utilized innovative practices to procure contractors for construction projects as well as private-sector firms to assist with other project delivery activities. This chapter highlights the Best Practices the team observed in both areas.

During the visits, team members were impressed that the agencies no longer considered many of the practices they used as innovative. For example, both Florida and Utah have used DB with such frequency that they no longer consider it innovative and speak of its application as just another delivery method at their disposal. This is an interesting contrast to other DOTs, which are still experimenting with DB and have little experience in its use.

Innovative Construction Contracting

The scan team observed that each agency visited, including the City of Phoenix, made substantial use of innovative contracting practices. It must be understood that even these organizations, which are viewed as leaders in the project delivery process, vary in degrees of usage of the observed tools. This section highlights the Best Practices noticed by the scan team.

Florida

FDOT does not have an office dedicated specifically to innovative contracting; it has assigned implementation to the districts. Like the Utah DOT, Florida extensively uses Design-Bid-Build (DBB), DB, A+B contracts, and CMAR. FDOT is a leader in the country when using project delivery tools based on project needs and desired outcomes. Detailed procedures and information on contracting practices are available on the FDOT Web site.

Missouri

MoDOT has used DB on several major projects with notable success. The scan team was interested in how MoDOT approached the new I-64 Project that is currently under construction in St. Louis. The PMs from MoDOT and Gateway Constructors briefed the team during the St. Louis visit. The team believes that several features of this project are considered Best Practices:

First, the state had a finite amount of money and was not sure how much reconstruction of I-64 and adjacent road works could be done with that budget. MoDOT advertised the project as a DB effort with a fixed price, but with a variable scope. Essentially, the DB teams proposed their own scope of work based on what they thought they could do based on the available funding. In the end, Gateway Constructors proposed a greater scope of work than their competitors, and the people of St. Louis received more value than anticipated before the process began.

A second new feature on this project was MoDOT's willingness to allow any specification currently in use by a state DOT to be applied to this project. This meant that the contractor could select a more efficient design or construction method than possible if required to strictly adhere to MoDOT standards. Gateway Constructors had greater design flexibility and MoDOT gained a quality level not possible otherwise. MoDOT notes that many naysayers criticized this approach and predicted inappropriate standards would be applied that did not fit operational, climatic, or other needs. However, as the project moves to a successful finish, MoDOT reports that its needs have been met with no compromise in quality.

Other areas where MoDOT has used novel approaches to contracting include Alternative Technical Concepts (ATCs) and Alternative Pavement Design. In the case of ATCs, the state allows a contractor to submit ideas for innovative concepts on projects out for bid. The state either approves or disapproves the proposed ATC and the contractor bids the project accordingly. The state nets benefits through lower bid prices and more efficient schedule outcomes. In Alternative Pavement Design, the contractor selects the type of pavement it will use on a project. This is a strictly market-based approach, where the chosen pavement design must meet certain

performance criteria. MoDOT has now expanded this alternatives proposal process so that it can be applied to drainage pipe, culverts, bridges, and other project features. Employees are convinced the state gets more value for their highway dollar by allowing this kind of creativity and innovation.

Phoenix

Phoenix utilizes an array of project delivery tools, depending on the specific needs of its projects. Its ability to use so many tools grew over the last seven or eight years. Included are DBB, DB, CMAR, and Job Order Contracting (JOC). JOC focuses on maintenance activities associated with the road and street system, while CMAR is used for most capital projects. In fact, the city has executed over $3 billion in CMAR projects in recent years. Figure 5.1 reflects the significant milestones the city passed to become an agency noted for Best Practices.

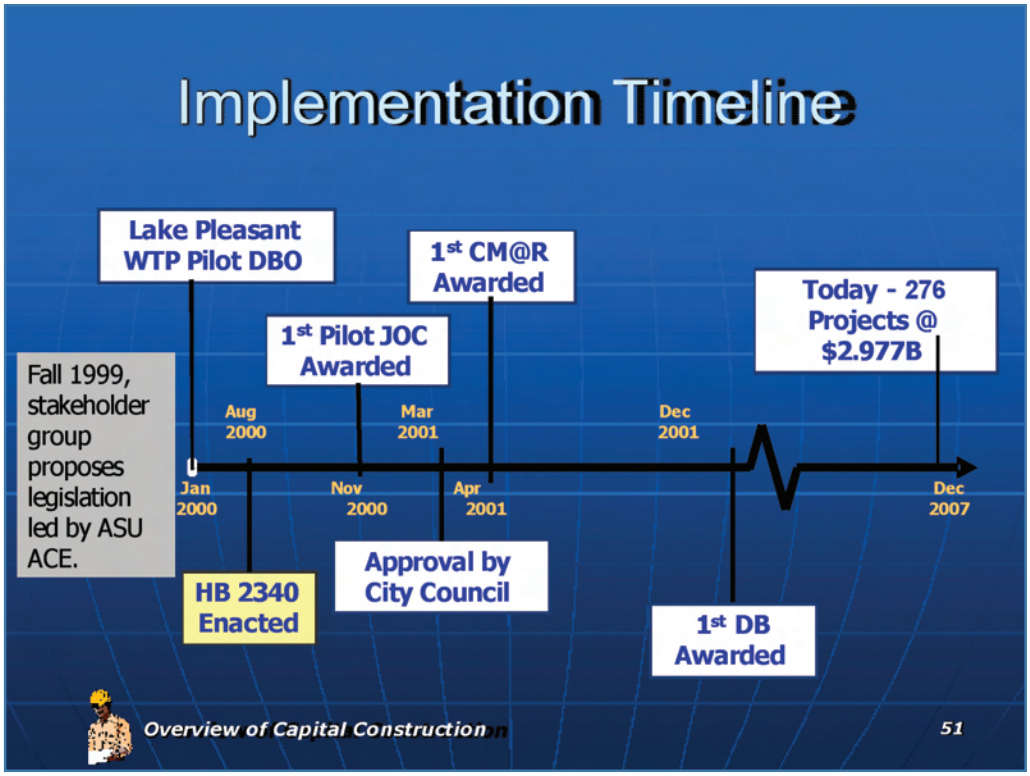


Figure 5.1 *City of Phoenix Best Practices Tracking*

Those using CMAR are better able to control project outcomes by hiring designers and contractors separately. The extensive use of these tools sets these agencies apart from their peers. Arizona's Revised Statutes that allow Phoenix and ADOT to use CMAR can be found at this link: http://law.justia.com/arizona/codes/title34/00603.html

Arizona

ADOT has been a proponent of innovative contracting methods and using consultants for many years. It has used DB on projects ranging from small interchanges to those valued at hundreds of millions of dollars. More recently, it embarked on implementing CMAR under the same statutory authority as Phoenix. ADOT has found the following benefits from using CMAR:

- Qualification-based selection
- Early contractor involvement
- Value analysis, constructability, known methods
- Open book contract

While ADOT is happy with CMAR, there have been challenges worth sharing. For example, it had to significantly modify the standard scope of work for design services to create an environment where the designer would be working closely with the contractor during the engineering phase. It also had to modify the specifications and scope of work for the contractor to accommodate an expanded role during design, yet still allow them the opportunity to continue as the constructor when the time came. Many stakeholder groups had to be educated about the process, how price negotiations should be accomplished, and about the checks and balances in place to ensure a fair price.

ADOT now has two CMAR projects under construction:

1. SR 89-Center Street to South Chino Valley
2. Loop 303-Cactus, Waddell and Bell Roads

A third project, the I-17-Cordes Junction Traffic Interchange, is a federal-aid project that is going through the FHWA's Special Experimental Project 14 (SEP-14) process for approval. The first two jobs did not involve federal funds and therefore did not require SEP-14 approval; the I-17 project does. A trend seems to be developing: projects that use CMAR and do not use federal funds can avoid going through the SEP-14 process for approval. ADOT also reports using JOC for the last two years.

Utah

UDOT has long been a proponent of innovative construction contracting methods. In 1997 it began constructing the $1.325 billion I-15 project in Salt Lake City, which at the time was the largest single contract in the history of the interstate system. Since then, UDOT has used DB on many projects and is one of the states that is accustomed to using that method.

More recently UDOT added CMGC to its arsenal of project delivery methods, enhancing its ability to efficiently construct projects. The scan team noted that many of the attributes found in Utah's CMGC model are similar to those of CMAR used by both the Arizona DOT and Phoenix.

UDOT's emphasis on using innovative project delivery methods stems from its desire to address risk and deliver projects more rapidly. The method chosen depends on the agency's goals for the project. For example, if the goal is faster delivery but UDOT chooses to have the contractor deal with risks, then DB is the preferred method. On the other hand, if considerable risks are associated with third parties, yet speed is still a desirable outcome, UDOT uses CMGC. In either case, UDOT wants a different relationship between the contractor and the designer than is typically achieved through the more traditional DBB approach. Figure 5.2 reflects how UDOT tracks risk allocation among the most commonly used project delivery methods.

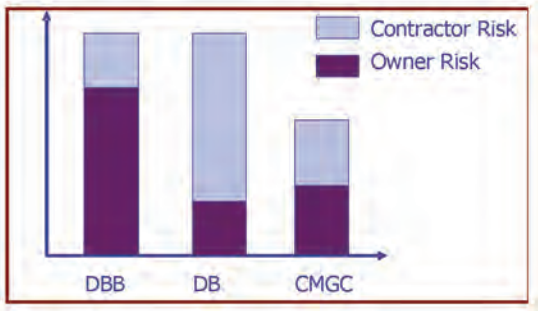


Figure 5.2 *UDOT Risk Ratios*

UDOT has used CMGC on 20 projects in the last three years. Of those projects, six are completed, eight are under construction, and the remaining six are in design.

Washington

WSDOT has embraced many of the same project delivery practices found at other agencies during the scan. It adopted DB for many complex projects and uses an exacting process to determine the delivery method for a planned capital improvement. State statutes authorize WSDOT to use CMGC; however, it has chosen not to use this method due to onerous provisions that make it unusable for highway work. One such provision is a severe limitation on self-performance of the work, which would turn the average highway contractor into a broker who simply hired subcontractors to do the work. The law was clearly written with commercial vertical construction in mind.

Innovative Consultant Contracting/Utilization

The states visited also displayed a wide variety of innovative practices focused on design and other services relative to the project delivery process. Many of these would be considered Best Practices; some are highlighted in this section, others are in Appendix E, Agency Responses to Amplifying Questions.

Several of the states established pools for on-call firms to do DOT work, which streamlines the process to have firms available for limited work by eliminating the extensive processes of selecting and negotiating contract terms. The team was particularly impressed with the process found at UDOT.

UDOT established a General Engineering Services and Local Government Pool for small or simple engineering and environmental services contracts with a value under $600,000. The pool is populated with consultants who have been prequalified in various disciplines. PMs draw from the pool to meet project specific needs.

For projects over $600,000 UDOT has a three-tiered system of contracting:

1. Standard Request for Quote
2. Streamlined RFQ
3. Request for Letter of Interest (RLOI)

The first two have been in place for years, while the RLOI is relatively new and was developed to accelerate the ability of a PM to get outside assistance. In addition, UDOT has an Early Notice to Proceed (Early NTP) process that allows a PM to avoid delays by getting the consultant moving on a project before final negotiations are complete. The Early NTP has a limited scope and duration but allows the state and consultant sufficient time to complete contractual issues while still getting a timely start.

Virtually all of the states visited use private-sector employees or firms to augment in-house staff. Sometimes a firm is under contract and other times it involves a single individual providing services in a key role. Arizona is one DOT with a mature program for integrating private-sector employees.

Arizona has long relied on the private sector to supplement in-house staff for project delivery. It has three methods of using private firms for on-call services:

- Temporary Tech—This program has been in place for 20 years and involves having firms already under contract who can provide individuals to fill specific slots at ADOT.
- Project Administration—Under this program consultants are selected to administer entire contracts in lieu of using ADOT staff.
- Materials Acceptance—These contracts involve firms providing the full array of materials testing services, including a full-service lab for construction projects.
- The Best Practices highlighted in this chapter offer a glimpse into what these agencies are doing to advance the project delivery process through innovative contracting practices. Additional observations not covered earlier include the following:
- Utah exhibited the most experience of a state DOT in the use of CMGC, while Phoenix was clearly a frequent user of CMAR.
- Benefits claimed by these agencies include fewer claims, improved relationships, faster project delivery, better quality, and better cost control.
- Every state used the FHWA's SEP-14 process to implement some or all of these innovative practices. Given the growing use of CMAR and CMGC, it would be appropriate for the FHWA to examine the need to continue the use of SEP-14 for authorizing the application of these methods.
- The scan team found evidence in more than one state that federal aid was purposely avoided, allowing more flexibility to utilize an innovative contracting practice that might not have been approved by the FHWA. States also used federal funds on rehabilitation projects, thus limiting the regulatory impacts accompanying the money.

- All but FDOT had special units that handled or assisted with implementing projects using innovative tools, such as DB, CMGC, and CMAR.
- Each state was limited by legislative authority as to which innovative delivery practices it used. For example, CMAR is authorized in Arizona, so both ADOT and Phoenix are using it. WSDOT has found the current statutes for CMGC untenable, so no attempts have been made. States are leveraging whatever flexibility they have to implement available innovative delivery methods.

CHAPTER 6

Community Involvement

One of the four focus areas the scan team identified as relevant to the project delivery management Best Practices topic was community involvement. The team recognized the importance of this subject in successful completion of capital projects by transportation agencies.

A historical review of efforts to engage the public and involve them in a proactive and positive way reveals an area that has greatly changed in the last 20 years. This retrospective look begins with the passage of the original NEPA 40 years ago, which set the stage for involving the public in the planning and study efforts leading to a transportation project. Early on, the nature of public involvement initiatives was largely obligatory because the law and the process required it.

In the mid-1990s, a few agencies began to see intrinsic value in being more open with the public and bringing them into the project development process in a more meaningful way. Some states adopted the principles of Context Sensitive Solutions (CSS) or Context Sensitive Design (CSD) as a means for raising the bar on public involvement and increasing the value of public input. Other states adopted aggressive, yet successful practices independent of the CSS program.

The evolution in community involvement has led these leading transportation agencies from the obligatory stage to a point where public engagement is both sought and leveraged. Team members recognized this fact; from this vantage point they included this important focus area in the scan.

Best practices in project delivery management and effective community involvement are not separate topics. The scan team found that agencies exhibiting Best Practices in the other focus areas—project management, performance measurement, and innovative contracting practices—also had community involvement activities of the same high caliber.

The discussion of Best Practices in community involvement includes a number of strategies the scan team observed. Some have already been mentioned in other chapters, such as FDOT's ETDM and WSDOT's MAP Team approach. In addition, Florida is a leader in utilizing Community Impact Analysis (CIA). These features may be mentioned in this context, but details will not be repeated.

Community Involvement from Concept through Construction

The Best Practices the scan team observed reflected that community involvement is not a singular moment, but a project-long effort. Each transportation agency visited during this scan elevated community involvement efforts to a level that made them a positive force in the project development process. These states saw community involvement not as a burden, but as a tool for enhanced ability to deliver projects. It was clear that advance investment in good planning and project development paid off. In Missouri, the scan team was told, "Public involvement is not a process—it's a philosophy." These states did not wait for the media to tell their story; they proactively moved information to the public in a variety of ways from long-term practices, such as door-to-door flyers, to more contemporary tools, such as YouTube and Twitter. Highlights and Best Practices the team observed are summarized in the following sections.

The Arizona DOT has matured in community relations to the point that the Communications and Community Partnerships Division is on a par with other major divisions in the agency, such as Intermodal Transportation, Motor Vehicle, and Aeronautics. This reflects the stature and importance given this important role in project delivery and other business activities. The staff comprises ten individuals in the Phoenix headquarters and six more in scattered sites. ADOT also has four consultant teams working on projects in Phoenix and on-call firms to do work statewide.

ADOT is similar to the other agencies in that it pushes the envelope of communication media used. ADOT sees the need to share information in ways that will appeal to technology-savvy customers. For example, they use YouTube and Facebook to get messages to those who frequent those venues.

FDOT's ETDM initiative has brought accessible project-related information to a new level in the transportation industry. Much of what can be gleaned from its Web site (http://etdmpub.fla-etat.org) is only marginally available elsewhere. This openness has set Florida apart among stakeholders and netted the agency many benefits as it advances controversial projects through the NEPA process. This, coupled with the CIA efforts, clearly makes this approach a Best Practice.

WSDOT's MAP Team effort is another initiative considered a Best Practice (see Chapter 3.0 for more information). Washington's community involvement effort is substantial. The DOT has 70 Public Information Officers (PIOs) assigned throughout the state, with only 14 actually located in Olympia; the PIOs are funded out of the agency's overhead. WSDOT is working hard to reach its constituency through more innovative and contemporary communications tools. For example, it now has a new toolbox containing the following options:

- twitter
- YouTube
- flickr
- Blogger http://www.wsdotblog.blogspot.com/
- Podcasts

The ETDM and MAPs programs are the most visible efforts to engage the public and, more specifically, resource agencies that will approve or have a role in the NEPA process. However, other DOTs have also adopted a philosophy of early and focused involvement with resource agencies. The scan team observed the agencies' attitude toward the NEPA process and public involvement. Staff often expressed that the NEPA process was something they realized was a part of the effort to deliver a capital project in their state and, as such, they worked to make the process effective and useful as opposed to fighting it every step of the way. This attitude paves the way to take a different approach instead of always fighting requirements.

Some states work hard to push public and community involvement to the field, where DOT employees or the consultants have more personal contact with interested stakeholders. Virginia and Utah have successfully done this. They have both found that decentralizing community involvement efforts allows relationships to develop with individuals and groups that would not be possible coming from headquarters units. On larger projects in both Florida and Missouri, dedicated community involvement personnel have been assigned to these efforts because coordination and communication activities are much more demanding.

Brand management is an interesting point to consider in identifying Best Practices in community involvement. In Washington, the state DOT originally allowed each project to develop its own brand and use that image to communicate with the public. More recently, WSDOT determined to rely on the agency brand only as a means for achieving consistency and uniformity in communications.

In Utah, major corridors adopt their own brand while still identifying their relationship with UDOT. Figure 6.1 shows the branding of a recent major project on I-80 in the Salt Lake City area.

Figure 6.1 *UDOT's Innovative 80 Branding*

The Missouri DOT has also allowed specific projects to adopt their own brand and leveraged this action to achieve greater connectivity with the public. Figure 6.2 shows how the I-64 project in St. Louis was branded.

Figure 6.2 *MoDOT's St. Louis I-64 Branding*

Other noted communication characteristics include the following:

- WSDOT's philosophy is to tell the news, whether it's good or bad.
- Some states use both formal and informal surveys. Utah has many years of formal survey data collected about agency performance and public perceptions.
- States with the most effective programs had early and continuous involvement with stakeholders and resource agencies and maintained CTSs.
- Investment in good planning, development of realistic STIPs and TIPs that managed public expectations and a good hand off between Planning and NEPA set up projects for success.
- The Best Practice states recognized that NEPA was the right thing to do and did not fight the process. By using effective public involvement practices in the NEPA process, these states addressed stakeholder concerns more effectively.
- Delegation of responsibility to PMs to work directly with the public was a noted attribute of the more effective communication systems.

Agencies also focused on how customers are able to access data and which media were helpful for communicating critical project-related information. A 2008 study conducted by UDOT about where the public was getting project information revealed the results shown in Table 6.1. Data like this has driven UDOT to concentrate on radio and television as a major means of communication. It has learned over the years when using radio and television that it cannot count on the respective stations to always provide the public with timely and accurate messages unless UDOT actually buys the time and creates its own. Relying on radio and television stations for a public service announcement or news item has resulted in preemption by other news the stations deemed more important, resulting in the time-critical UDOT message never getting out.

Project Project Information Source	% of Public Use
Radio	54%
Television	45%
Newspaper	18%
CommuterLink (UDOT's traffic information Web site)	15%
UDOT's Web site	7%

Table 6.1 *UDOT Public Info Source Results*

WSDOT has developed the CTS, which provides the ability to track individual commitments from inception through design, construction, and maintenance. Commitments incorporated into the NEPA documents, permits, letters, approvals, memorandums of understanding, and other documents are put into CTS. As the project develops, the information in CTS is passed on to successive groups to ensure that all obligations are met.

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. State employees sought out and created close relationships with a wide array of groups, including service providers such as contractors and consultants, resource agencies at state and federal levels, and third parties such as utilities and local governments. In many cases cooperative agreements were entered into that brought definition and formality to these relationships; states have then been able to advance environmental streamlining and stewardship efforts. The ETDM effort in Florida is the product of

several years of relationship development between FDOT and key stakeholder groups. Ultimately, FDOT entered into cooperative agreements that resulted in the effective model they follow today—but it took significant effort just to get everyone together in the first place.

Public Involvement Requires Understanding Customer Needs

As mentioned before, the ability to separate community or public involvement activities from other focus areas of this scan becomes difficult because they are so integrated. This section, which is about soliciting and acting upon data gathered from customers, might also have been placed in Chapter 4.0, Performance Measurement.

The scan team found that most of the states had strong programs designed to seek out public sentiment and input on performance, programs, and projects. This section highlights some of the Best Practices the team observed.

For more than a decade, UDOT engaged in an aggressive effort to obtain public input on a variety of operational attributes. While many agencies do public opinion research, Utah's efforts in this area exceed all others in terms of the historical volume of information and the depth of the public inquiries. The sample of trend information presented to the team is included in this report. Table 6.2 is a sampling of the available information on agency performance and public sentiment. The question posed was "Do you have a favorable or unfavorable impression of the Utah Department of Transportation, or UDOT?"

	2001	2004	2005	2006	2007	2008
Very favorable	26%	22%	20%	20%	22%	21%
Somewhat favorable	47%	50%	54%	49%	50%	53%
Somewhat unfavorable	13%	16%	15%	16%	12%	16%
Very unfavorable	6%	4%	6%	7%	5%	7%
Don't know (VOL)	9%	8%	6%	8%	11%	4%

Table 6.2 *UDOT's Historical Public Perception Results*

As part of its Tracker system, MoDOT measures customer sentiments in a variety of ways. Figure 6.3 through Figure 6.5 show three methods it uses to assess performance against public expectations (see http://www.modot.mo.gov/about/general_info/Tracker.htm for the complete report).

Figure 6.3 *MoDOT Customer Satisfaction Tracking*

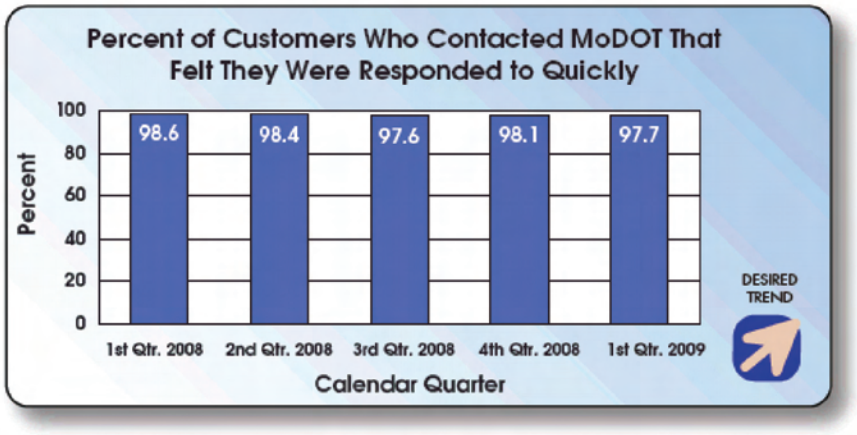


Figure 6.4 *MoDOT Customer Satisfaction with MoDOT Response*

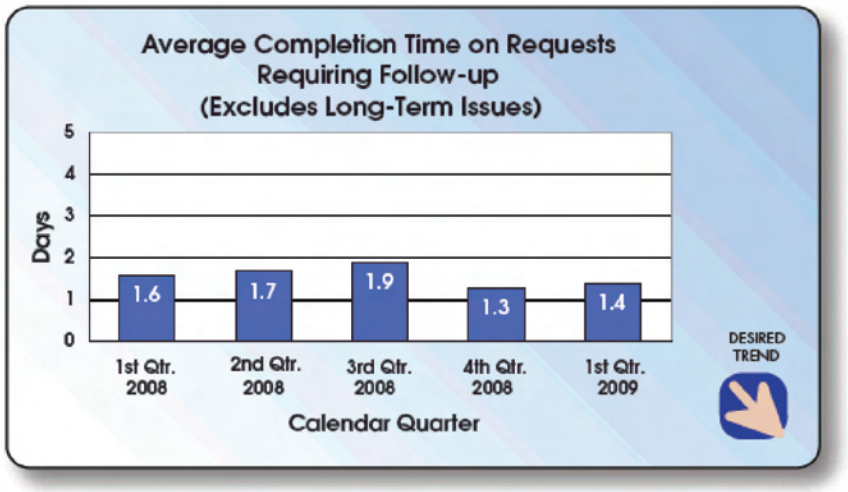


Figure 6.5 *MoDOT Average Completion Time for Requests Requiring Follow-Up*

CHAPTER 7

Planned Implementation Activities

The scan team recognizes the importance of implementing scan findings. History has shown that dissemination of information throughout the transportation industry has long been a challenge. Nevertheless, the team identified many important Best Practices and believes that they would benefit other state and local transportation agencies. The implementation activities presented here include a wide variety of efforts intended to cover the array of interested parties in the industry. Each strategy is listed with a member of the scan team who will be responsible for ensuring its implementation.

Strategy 1: Articles in magazines and professional journals

A traditional means for sharing information in the transportation industry is through the monthly periodicals that are widely read by professionals. Examples of these publications include Public Roads, Better Roads, and Governing.

Strategy 2: AASHTO Web site content

AASHTO's Web site is a popular and effective tool for distributing information to state DOTs and other public and private-sector groups and individuals. Posting one or more summaries of the scan to the AASHTO Web site will help with sharing this information.

Strategy 3: Publish in TR News

The TRB publishes *TR News* six times a year. Each issue contains relevant information about current and emerging subjects in the transportation industry. The format for an article in TR News is conducive to a comprehensive look at this scan's Best Practice findings.

Strategy 4: Publish in Research Digest

The TRB publishes Research Digest, which offers a more succinct format for sharing the scan team's findings. Typically, each issue is subject-specific and would lend itself well to these Best Practices.

Strategy 5: AASHTO presentations

Many of AASHTO's standing committees and subcommittees are established to cover the precise topic areas of this scan. As such, members of these bodies should be exposed to the team's findings and identified Best Practices. The following include specific committees, subcommittees, and other entities that would be appropriate for presentations of this type:

- Subcommittee on Construction
- Standing Committee on Highways
- Standing Committee on the Environment
- Subcommittee on Design
- Board of Directors
- Standing Committee on Performance Management
- Leadership Forum

Strategy 6: Regional meeting presentations for state DOTs

State DOTs meet at least annually in a regional format to share information and address issues that reflect some of their unique geographic needs. The scan team believes that these regional meetings offer valuable opportunities to share information:

- Northeast Association of State Transportation Officials (NASTO)
- Southeast Association of State Highway and Transportation Officials (SASHTO)
- Mississippi Valley Conference
- Western Association of State Highway and Transportation Officials (WASHTO)

Strategy 7: FHWA Web site and other information exchange opportunities

The FHWA works hard to share information with the transportation industry through its Web site and other avenues. As one of the agency sponsors for the scan, it is logical to expect that FHWA will help disseminate these Best Practices in project delivery management.

Strategy 8: Webinars

Webinars have become a very popular medium to communicate critical information to a large audience at one time. The scan team believes that using webinars will assist in getting this information out to a large audience who may not be able to attend the other meetings and venues listed in this chapter. It is envisioned that the webinars be specific to one focus area rather than trying to address all of the Best Practices described in this report.

Strategy 9: TRB Committee presentations

Numerous opportunities exist to present the findings and Best Practices of this scan to the many committee meetings and sessions sponsored by the TRB. These opportunities may occur at either the annual meeting in Washington, DC, held each year in January, or at the summer meetings of the various TRB entities. Examples of the committees that would be relevant to this topic include the following:

- Performance Measurement
- Management and Productivity
- Project Delivery
- Construction Management

Strategy 10: Share results using contemporary media

The team recognizes that potential users of the Best Practices identified during this scan will be more readily reached through contemporary media, such as YouTube, Facebook, Twitter, or a blog. The team will endeavor to move contents from this report and the review of these agencies to members of the industry through a sampling of these tools.

Strategy 11: Incorporate Best Practice information into reauthorization initiatives

The current transportation authorizing legislation (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users [SAFETEA-LU]) expires September 30, 2009. Efforts are now underway to create and pass a replacement bill in Congress. This opportunity typically only comes once every five or six years, so the team believes that it would be appropriate to bring to those involved information relating to these Best Practices in project delivery management. This will be done through a variety of agency and association initiatives.

Strategy 12: Presentations at association meetings

Key associations in the transportation industry will want information from this scan to be shared with their members, and national meetings represent rich venues for doing this. Members of the scan team will coordinate presentations at these meetings:

- American Road & Transportation Builders Association (ARTBA)
- AASHTO/ACEC Task Force
- National Association of County Engineers (NACE)

Strategy 13: Federal Lands Strategic Planning meeting presentation

An opportunity exists for this information to be incorporated into the strategic planning process associated with the Federal Lands Division of the FHWA.

Strategy 14: Provide a knowledge transfer session (Webinar) to the scan agencies

The agencies visited by the scan team were generous in presenting information and practices. Some common Best Practices were observed among them, while others were unique to single states. The team believes a webinar for these agencies would allow for sharing the contents of this report.

Strategy 15: Share Best Practices with SHRP II

The TRB has a major research initiative underway focused on innovation in transportation. Research efforts are divided into four areas: safety, renewal, reliability, and capacity. The team will share the results of this scan with appropriate leaders of the SHRP II initiative.

Strategy 16: Sharing Best Practices with LTAP

The Local Transportation Assistance Program (LTAP) is focused on disseminating information to all levels of government and practitioners who may not be operating in the same organizations as the state DOTs. The success of LTAP is without question and this network provides a powerful opportunity for the Best Practices observed in this scan to be shared with a large segment of the industry.

Strategy 17: Share innovations through AASHTO's TIG

AASHTO's TIG was established to assess and advance innovations in transportation technologies and practices. The Best Practices identified in this scan will be shared with the TIG as a means to further its distribution through the AASHTO organization and its affiliates. The team believes that Florida's ETDM, Utah's ePM, and Washington's MAP Team reflect just some of the findings that would be appropriate for the TIG to consider.

Strategy 18: Package the Best Practice findings onto a CD for distribution

The nature of the transportation industry requires a more aggressive means for distributing the team's findings. To facilitate this, the team has proposed preparing a CD with the information gathered during this scan for ease of distribution to a wide audience that can then adopt innovations as appropriate.

Strategy 19: Coordinate findings with the March SCOR meeting

AASHTO's Standing Committee on Research (SCOR) determines how millions of dollars in pooled research funds are spent to benefit the transportation industry at large. Many of the scan findings are relevant to the discussions held and decisions made at this meeting.

The team recognizes the daunting nature of this list of implementation activities. Nevertheless, it believes that these Best Practices need to be shared with as many organizations and individuals as possible to ensure more effective project delivery across the nation.

As with all plans, timing will be critical. To that end, the team has committed to completing as many of these strategies as possible within 90 days of the scan visits. From that point, the team will determine the schedule for further implementation efforts.

APPENDIX A: SCAN TEAM BIOGRAPHICAL INFORMATION

APPENDIX A

Scan Team Biographical Information

JAMES C. MCMINIMEE (AASHTO CO-CHAIR) is the Director of Project Development at the Utah Department of Transportation (UDOT), and has been with UDOT for 24 years. Jim leads statewide areas of Design, Construction, Right of Way, Environmental, Structures, Engineering Services and Research. The Project Development Division oversees statewide policies procedures and Process for Project Management, and is also responsible for engineering policy and business strategy for UDOT. McMinimee and Project Development Division have been a part of many of the innovative initiatives UDOT has undertaken, such as the implementations of Design-Build and Construction Manager / General Contractor (CM/GC) contracting, Accelerated Bridge Construction (ABC), implementation of the Transportation Technician program and implementation of the GPS Network. Before coming to Project Development in 2001, McMinimee served as the Region Two Director in Salt Lake City for six years. He also served as the Director of Olympic Operations during the 2002 Olympic Winter Games in Salt Lake City. Additionally, McMinimee has over 10 years combined experience in Materials and Central Maintenance Operations at UDOT. McMinimee received his Bachelor of Science degree in Civil Engineering from the University of Utah and is a licensed professional engineer in the State of Utah.

SHARI SCHAFTLEIN (FHWA CO-CHAIR) is the Team Lead for Program/Policy Development in Federal Highway Administration's (FHWA) Project Development and Environmental Review Office and has served in the position for 5 years. Program Areas that Schaftlein champions include: the American Association of State Highway and Transportation Officials (AASHTO) Center for Environmental Excellence, Federal Agency Coordination, Environmental Conflict Resolution, Performance Measures, Research, and Sustainability/Climate Change. In addition, she supports 3 project development specialists that provide technical assistance to 11 States. For 11 years prior, Schaftlein was with Washington State Department of Transportation's Environmental Office, where she held the positions of Water Quality Program Manager, Streamlining Initiatives Manager, and Deputy Director. She has also held environmental management positions with the West Michigan Environmental Action Council, and the Quileute Tribe in La Push, WA. She was a graduate of Indiana University with a Bachelor of Science degree and a Master of Science degree in Environmental Science. Schaftlein serves as the FHWA representative on the NCHRP 25-25 Panel "Quick turn-around environmental research" and is a Member of the Transportation Research Board (TRB) ADC10 Environmental Analysis Committee. Internationally she participated in the European Recycling in Highway Environment Scan, and served as the U.S. representative and secretariat for the World Road Association's Committee on Sustainable Development.

THOMAS R. WARNE (SUBJECT MATTER EXPERT) founded Tom Warne and Associates in 2001 after nearly 22 years of working in the public sector. He is the past Executive Director of the Utah Department of Transportation where he was responsible for the $1.3 billion design-build I-15 Reconstruction Project. Warne is also the former Deputy Director of the Arizona Department of Transportation. His firm focuses on assisting transportation agencies resolve complex project delivery and public policy issues. Warne has extensive experience on major projects and programs throughout the country including the Woodrow Wilson Bridge, San Francisco Oakland Bay Bridge, SR 520 Floating Bridge and others. He holds a Bachelor of Science degree in Civil Engineering from Brigham Young University and a Master of Science degree in Civil Engineering from Arizona State University. Warne is a licensed professional engineer and is the past President of the AASHTO,

past Vice-Chairman of the TRB Executive Committee and past Chair of TRB's Task Force on Design-Build Committee.

SIDONIA DETMER is the Project Management Office (PMO) Assistant Director for the Virginia Department of Transportation (DOT) in Richmond, Virginia. Detmer is responsible for directing, developing, and implementing statewide project management policy, procedures, processes, tools, techniques, and training. She is responsible for leading project management related statewide process improvements, research of Best Practices, and integration of project management policies, procedures, and innovative tools. Prior to joining PMO, she led complex analyses and deployment of improvements in project & program management, project development processes, and performance measurement. Detmer has served with Virginia DOT, in project development, management, and performance measurement, for 14 years. She is a graduate of the Virginia Commonwealth University and holds a Bachelors of Science Degree in Operations Research. Ms. Detmer is a Project Management Professional accredited by the Project Management Institute.

MARK C. LESTER is the Upstate Regional Production Engineer at South Carolina Department of Transportation (SCDOT). He leads a team of 38 project engineers and designers responsible for the delivery of roadway and bridge projects in the 12-county upstate region. Lester has been with SCDOT for over 18 years and has spent the last 15 years in the Project and Program Development offices of the Preconstruction division. Prior to his current position, Lester served as the Program Development Engineer for the western half of the state. As Program Development Engineer, he led a group of Program Managers primarily responsible for establishing and maintaining project schedules and budgets for projects in the western region. Lester is a 1991 graduate of Clemson University with a Bachelor of Science degree in Civil Engineering and is a licensed professional engineer in the state of South Carolina. He is a member of the AASHTO Subcommittee on Design and the Technical Committee on Environmental Design.

GARY MROCZKA is the Director of Production Management Division at the Indiana Department of Transportation. The division is comprised of about 260 staff within eight offices directly related to project delivery and responsible for implementation of statewide policy and procedures, training, technical review, major project management and in-house production. The offices are Environmental Services, Aerial Engineering, Geotechnical Engineering, Project Management, Roadway Services, Structural Services, Real Estate and Public Hearings. In 2005, Mroczka was responsible for the development of the wholesale edit of the department's project development process (PDP), which reduced major project delivery by 40%. In 1989, he received a Bachelor of Science degree in Civil Engineering from the University of Michigan. Mroczka is a licensed professional engineer in the State of Indiana and a member of the Institute of Transportation Engineers (ITE) Indiana Section.

DAVE NICHOLS is the Director of Program Delivery at Missouri Department of Transportation (MoDOT). Nichols leads the statewide areas of transportation planning, environmental services, roadway design, bridge design, right of way acquisition and management, consultant professional services, construction project administration, materials and product testing and certification, program estimating, contractor bid advertising, letting and review and MoDOT's innovative contracting process. Nichols is responsible for delivering MoDOT's Statewide Transportation Improvement Program (STIP), ahead of schedule and under budget, and also for finding new ways to deliver the STIP to MoDOT's customers. Nichols is the lead person for MoDOT for the implementation of the Design/Build project delivery method in Missouri. In his twenty-four plus years with MoDOT, Nichols has held numerous positions relative to delivery and management of projects, including district engineer. Nichols is a graduate of University of Missouri-Columbia with a degree in civil engineering. He is a licensed professional engineer in the State of Missouri and a member of the Missouri Society of Professional Engineers, National Society of Professional Engineers.

JOYCE N. TAYLOR is the Assistant Director of the Maine Department of Transportation Bureau of Project Development. The Bureau of Project Development is responsible for designing and constructing all highway,

bridge and multimodal projects for the Department. The Bureau is also responsible for managing the Civil Rights Program, Materials and Testing Section, the Property Office and the Contracts Section. Taylor helped to initiate the Maine Dashboard which is used to measure project and program budget and schedule targets. Prior to her current position in Maine DOT, Taylor held positions as the Environmental Engineer of Construction, the Assistant Program Manager of the Urban & Arterial Highway Program and worked in a Division Office. She previously worked as a consultant in the Transportation Industry and at Maine Department of Environmental Protection. Taylor graduated from the University of Maine with a Bachelor of Science degree in Chemical Engineering and is a licensed professional engineer in the State of Maine. She is currently serving on the NCHRP Project 20-73 "Accelerating Projects and Program Delivery" and serves as the Chair of the Subcommittee on Project Delivery under the AASHTO Standing Committee on Quality.

ALAN TEIKARI is the Chief of the Highway Design Branch for FHWA Eastern Federal Lands Highway Division (EFLHD). Teikari leads a staff responsible for the project management, A/E contract management, highway design, and development for all projects delivered by the EFLHD for its Federal lands and State DOT partners. He has worked for the FHWA since 1979, graduating from the FHWA's Highway Engineer Training Program then in various design, contracting, programming and management positions within the EFLHD. Before his current position, Teikari was the Chief of the Planning and Programming Branch where he was responsible for leading planning, programming, environmental compliance, and all contract acquisition within the Division. Teikari's 29 years of Federal Lands design, programming, contracting and management experience provides him with a unique hands-on expertise and perspective within the FHWA related to program and project delivery at the Federal level. Teikari graduated from the University of Massachusetts at Amherst with a Bachelor of Science degree in Civil Engineering in 1978 and a Master of Science degree in Transportation Engineering in 1981. He is a licensed professional engineer in the State of Virginia and is a member of the Project Management Institute.

CONNIE YEW is the Team Leader for the Stewardship and Oversight Team in FHWA Office of Infrastructure, and has been with FHWA for 25 years. In her current position, Yew directs the development and implementation of a corporate approach on Risk Management and on Stewardship/Oversight initiatives. Yew's team helps guide FHWA so that Federal investment, particularly in infrastructure, is well managed and performing. In 2004, Yew co-chaired an NCHRP international scan on Transportation Performance Measures. She also participated in several project delivery reviews such as "Strategies for Reducing Highway Project Delivery Time and Cost" and "Comparing State DOT's Construction Project Cost and Schedule Performance: 28 Best Practices from Nine States". Yew holds a bachelor's degree in civil engineering from the University of Maryland and a master's degree in public administration from the George Washington University. Yew is a licensed professional engineer in the State of Maryland

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APPENDIX B

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APPENDIX C

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APPENDIX D: AMPLIFYING QUESTIONS AND AGENCY RESPONSES

APPENDIX D

Amplifying Questions and Agency Responses

For the purposes of this scan, the definition of project delivery will be those activities that occur between preliminary scoping (e.g., after corridor studies and concept reviews but prior to the start of the NEPA process) and ends when project acceptance occurs at the completion of all construction activities.

In addition, this scan's definition of outsourcing does not include administrative functions such as payroll, benefits, etc. that are not directly related to project delivery management.

Project Management

Describe your project management process, including how it is structured, how it has evolved, levels of authority, internal hand offs, and internal relationships and coordination activities.

AZ: We have separate groups for the discipline or function of project management. With improved communication, partnering, and understanding amongst all disciplines, project management has evolved to have more focus on environmental stewardship and public participation. The cradle-to-grave project management concept spawned numerous subprogram projects.

FL: Project management has evolved in FDOT from centralized to decentralized. This occurred in 1988. Project management is handled by the seven districts and the turnpike office. Project management in the central office focuses on policies and procedures and training. The actual design processes were then assumed by the district offices (referred to as the line offices). The central office does have responsibility for highway/bridge projects; it is acting like a consultant to the districts. Central does the design exception reviews and also handles the contract lettings. Consultant selection is primarily done in the districts. All federal-aid projects are let by the central office, and projects without deferral funds can be let either in the districts or in the central office.

The central office focuses on training to ensure that its PMs have the skills to do their job. It also provides training for PMs that are not FDOT employees. (Not all of its PMs are engineers.) No special training is provided for Priority Programming Process (PPP) projects.

All of the turnpike's PMs are certified and are also engineers. FDOT does not assign its own PM to oversee the consultant PM who is actually doing the work. The legislature required PM certification for PMs for projects that are above $60 million.

DB projects are being done by the districts by their professional services group. PPPs are partially managed from the central office. The I-595 project is being managed in the district with the help of the central office for financial issues. Structures for this project are also reviewed and approved by the Tallahassee Structures Office. The overall process for a PPP is managed from the district like a DB project. There is more central office management involvement when it comes to PPP efforts versus DB.

NEPA is handled by the districts, with oversight by the central office. In the districts, the NEPA effort reports to the Director of Transportation Development.

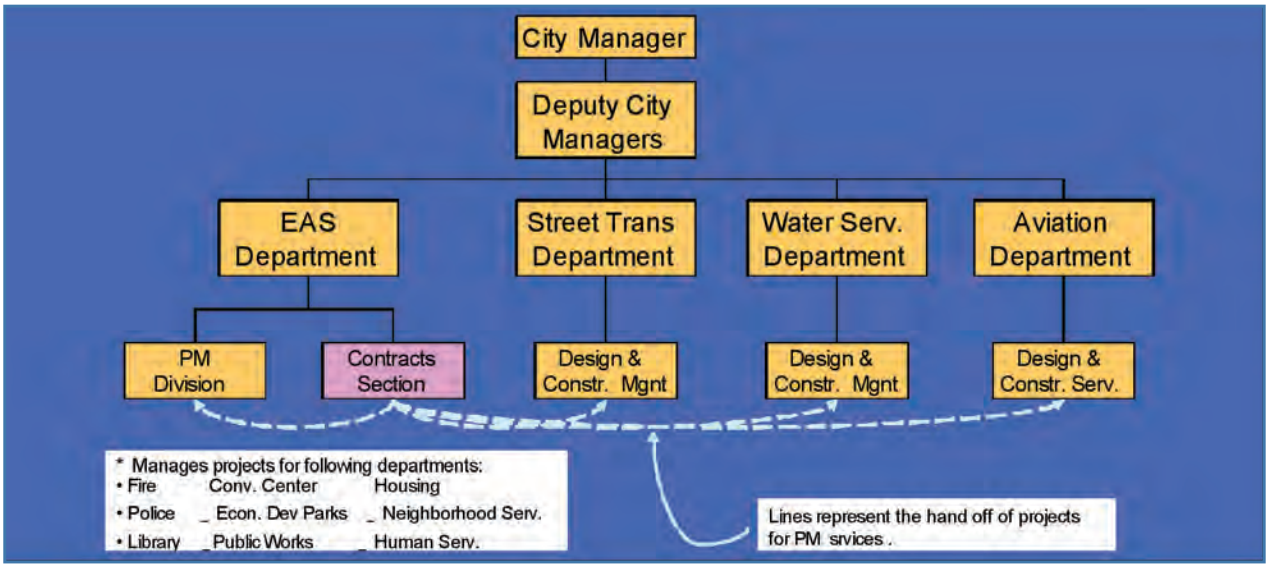
MO: The project management process places a single manager in total responsibility over a project. The process is far from unilateral, however, as the PM receives input from a multidisciplinary core team on each project. The core team generally consists of staff from design, construction, maintenance, traffic, materials, public relations, and any other discipline that may have a bearing on the project. The PM has no line authority over the core team and is still responsible for all final decisions.

The PM concept was conceived in the mid-1990s when MoDOT sought to emulate the success of private

industry by placing a single point of contact in charge of the project from cradle to grave. This effort happened to coincide with a new state statute that required a licensed engineer to sign and seal all public work.

Where authority is concerned, MoDOT PMs generally report directly to the district engineer and have no direct reports themselves.

PHX: The city has a decentralized project management system, as shown below. The EAS Department manages the selection and award of all design and construction contracts for all city projects. If the projects are funded by and provide infrastructure for the Streets, Water Services, and Aviation departments, the project management of those projects is handed off to those respective departments. If the project is funded by any other city department, the project management of those projects is provided by EAS.



This project management arrangement was developed in the late 1980s. Prior to that time, the Engineering Department had managed all capital construction projects. There was a lack of communication at times between the operating departments and the Engineering Department, so the decision was made to break out project management sections from the Engineering Department and move those staff to the operating departments that they supported to enhance communications and better serve the needs of the infrastructure departments. Project management for non-infrastructure departments remained with engineering, which was renamed Engineering and Architectural Services.

VA: Project management responsibilities are decentralized, and the formal PM Department Policy and Procedures were published in February 2008. Dedicated cradle-to-grave PMs are assigned to projects with high complexity and/or risk. Dual-hat (i.e., responsible for design and project management) role PMs are assigned to turnkey, low-risk projects. The PM is responsible for managing the project scope, schedule, and budget. In most cases, a hand off occurs after a project award from the PE PM to a different CN PM.

WA DESIGN: The following is a link to our intranet project management page: http://www.wsdot.wa.gov/Projects/ProjectMgmt/. We are now a cabinet agency, so reporting has changed significantly.

WA ENVIRONMENT SVCS: N/A

WA PROJECT CONTROL & REPORTING OFFICE (PCRO): N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

What reasons caused your agency to adopt your current project management processes? Are there issues on the horizon that might cause you to make further changes to your process?

AZ: The reasons were we wanted a focal point for project development/delivery resulting in a short development period and more on-time delivery, less scope creep, better internal and external customer service and satisfaction, and less rework. Alternative construction, such as DB, CMAR, PPP, and data integration are two areas that might cause further changes to our current project development process. ADOT continues to improve its process through its Quality Process Integration (QPI) program.

FL: FDOT was decentralized in 1988 by its legislature to bring more local input into its processes and make its work more responsive to local needs and conditions. STIP development is managed in the districts. The Governor appoints the Secretary of Transportation. The Secretary then appoints the seven District Secretaries, the Assistant Secretary of Engineering and Operations, the Assistant Secretary of Finance and Administration, and the Assistant Secretary for Intermodal Systems Development and other executive positions. A Transportation Commission has an oversight role. The Commission has final approval of the STIP. See Attachment A.

MO: As previously mentioned, the move to the PM concept was an attempt by MoDOT to capitalize on the successful business model being practiced by private industries at the time. It also allowed the DOT to be in compliance with new state certification statutes. The PM model also allowed a multidisciplinary approach to project delivery while still presenting a single point of contact to the public.

Current market and economic volatility, as well as MoDOT's constant hunger for more innovation and value may prompt further changes in project management structure.

PHX: The reasons for the current organization are given in the previous answer. The process appears to be working well, and there are no plans to change this process at this time.

VA: Key efforts were to restore public trust, improve VDOT's overall on-time and within-budget performance, and ensure the most efficient and effective project development and delivery with diminishing resources, the delegation of authority, and de-centralizing project management.

WA DESIGN: Loss of institutional knowledge and expected delivery of very large programs nudged us into establishing a more defined project management process. Fiscal issues will likely lead us to a more flexible design approach and accountability.

WA ENVIRONMENT SVCS: N/A

WA PCRO: Prior to 2003, highway projects were funded by a 23-cent gas tax and budgeted at the program level. WSDOT had the authority to internally manage project delivery within the program levels established by the state legislature. In 2003, the state legislature initiated line-item budgeting for projects funded by an additional 5-cent gas tax increase, followed quickly by an additional 9.5-cent gas tax increase in 2005.

The line-item budgeted project delivery process has to be managed differently, as project budgets have to be managed within legislatively approved biennial cash flow appropriations and total cost appropriations. WSDOT does not have the authority to increase biennial cash flow, total cost, or scope for line-item budgeted projects. Approval for cost increases resides with the state legislature when in session or the governor's Office of Financial Management between legislative sessions (as long as the total biennial appropriation is not exceeded). However, scope change approvals for line-item budgeted projects rest solely with the state legislature. WSDOT is also required to summarize quarterly project costs and schedule changes for line-item budgeted projects. On the horizon is legislative-mandated earned-value reporting for line-item budgeted projects, which will impact WSDOT's project delivery management and reporting processes.

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

Does your agency currently utilize PMs/engineers to oversee the project delivery process? If so, briefly describe their role. What training and certification requirements do you have for your PMs?

AZ: Yes. The PM has the responsibility for ensuring that all project development steps are followed and for leading, assisting, delegating, and coordinating work efforts as required for the successful completion of all work tasks to meet the project purpose and needs. The PM is responsible for ensuring that all project team members and stakeholders are adequately involved in the project development process. The PM has specific responsibility for the project scope, schedule, and budget and, with project team consensus, is empowered to make decisions regarding these items. The PM monitors progress on project scope, schedule, and budget and, with project team consensus, is empowered to make decisions regarding these items. The PM monitors progress on project activities and assists the technical leader in taking action to correct negative variances from the approved plan. The PM is also responsible for coordinating and communicating with internal and external stakeholders involved in the project.

FL: The transportation development director position is responsible for all work until the bidding, at which point it goes to the director of Operations, who then follows the project through construction and into maintenance.

FDOT provides PM training for all who are involved in the process. A PM handbook is available on CD. In the past FDOT might have had a PM take the project from concept to concrete, but now it does not have the luxury of doing that given the workload. Typical PMs have at least two projects to bring to completion in a year and 6 to 12 (varies by district; could be 10 to 14) projects for which they have design responsibility. During the NEPA process, a design PM is not typically assigned. The District Environmental Management Office (EMO) has responsibility for managing the NEPA process. After the NEPA process is done, it assigns the project to a design PM.

Originally FDOT had problems with the hand off between the PD&E section and the construction group. In the past it had trouble with communicating commitments. FDOT now has processes in place to make sure that commitments are met. This is done internal to the district functions.

One of the problems with PMs is the management of time so that they have enough time to manage their projects after taking care of all public inputs.

The PM is not usually the Engineer of Record. Each district has some who can sign and seal project plans. FDOT requires consultant PMs to sign and seal their own plans. The GEC can sign and seal their own plans. About 80% of FDOT's design work is outsourced.

PMs spend their time on these areas:

- 10% engineering and technical issues
- 20% schedule
- 20% on costs for the project and for the consultant
- 20% public involvement
- 30% other coordination and miscellaneous tasks

All districts have monthly production meetings to coordinate all their projects and how they are handled between their district functions.

MO: Yes. Their role has been described previously. In general, PMs must have a B.S. degree in Civil Engineering, be a registered Professional Engineer in the state of Missouri, and have six years of progressive experience within MoDOT.

PHX: As described previously, the city uses a decentralized project management approach. Most city projects are managed by city staff. All four of the project managing departments have tiers of project management staff, ranging from degreed, registered PEs, architects, and landscape architects, to non-degreed, unregistered PMs and engineering technicians who have extensive field experience. The project management team also includes construction inspectors who in effect are the PM's eyes and ears in the field. The level of qualifications and experience of individual PMs usually vary with the size and complexity of the projects managed.

In addition to internal PMs, the city will occasionally outsource project management responsibilities if project requirements exceed internal staffing capacity. The Water Services and Aviation Departments use consultant

PMs more frequently than the other project managing departments do.

The departments also use differing approaches in managing projects. For example, the EAS and Aviation Departments use a cradle-to-grave project management approach, where assigned PMs will oversee a project from the planning phase through design and construction until completion and turnover to the operating staff.

The Streets and Water Services Departments have PMs for the planning and design phases who then hand off the projects to a different set of PMs who see the project through construction and closeout.

The top tier of PMs in the city have college degrees in the respective disciplines and are required to be registered professionals. These senior PMs include civil engineers, mechanical engineers, electrical engineers, architects, and landscape architects. The next level of PMs can either be younger employees who may have received their college degrees or veteran employees who have acquired extensive on-the-job training in project management but do not have college degrees.

The city uses a variety of training methods to ensure that its project management staff is properly qualified, including internal training conducted by management staff, as well as training courses provided by ASU through the ACE. City staff also attends seminars and conferences sponsored by various professional organizations.

VA: PMs are assigned to every project; they are responsible for managing the project scope, schedule, and budget. PMs are encouraged to obtain PMPs. VDOT has had a PM certification program and training in place since 2001.

WA DESIGN: Yes, WSDOT uses project engineers to manage the project offices in which there are usually two design squad leaders who have a design team under them. All project engineers are required to have a PE license, and the department offers entry-level project management training for them.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

Are the NEPA documents and design plans produced within the same division or different divisions within your agency? Briefly describe your structure.

AZ: The Office of Environmental Service (OES) is a new office in ADOT that oversees all environmental programs within the agency and is a branch of the Intermodal Transportation Division (ITD). OES also assists the Multimodal Planning Division (MPD) to prepare an Environmental Overview to link transportation planning and NEPA. Management and administrative responsibility for advancing a highway project through the project development process lies with the deputy state engineers of the Development Program and the Valley Transportation Program, with support from the deputy state engineer of Operations and the director of the OES, which reports to the state engineer.

FL: The NEPA documents are produced in the same division in the district offices. The central office supports the policies and procedures. NEPA is divided into two divisions that work together: the environmental/planning group and the design group.

The EMO group starts the environmental process. When it is at a pivotal point or needs assistance with issues, stakeholders, or third parties, it works with other groups within the district or goes to the central office. The EMO can stay involved through construction, depending on the nature of the issues it is mitigating.

MO: NEPA documents are produced in coordination between the Design Division at the state Central Office and the Design Divisions at the individual districts, with help from consultants on selected documents. The state Central Office Design Division houses the Environmental and Historic Preservation Section, which directs NEPA work.

PHX: EAS has an Environmental Section that performs environmental assessments on city-owned property. Outside project consultants are used to perform environmental mitigation and impact studies when required.

Street Transportation Department (STD) projects go through a five-step environmental process provided and fully reviewed by Arizona DOT:

4. Initial scoping effort
5. Public and agency scoping
6. Environmental surveys and technical reports
7. Draft environmental document
8. Final environmental document

These documents are managed through the Street Transportation Department and produced by qualified environmental consultants. Coordination is typically done through our assigned PM and an environmental specialist overseeing the environmental consultants. In addition, federal nexus can be initiated if the following arises:

- When federal funding is used for the project
- When acquiring any new federal right-of-way or just using federal lands, including temporary construction easements on federal lands
- When the project needs a permit mandated by any federal law (e.g., Clean Water Act, 404/401, and 402)
- After all satisfactory documentation is produced and coordinated with ADOT, final concurrence and NEPA approval is obtained.

VA: The NEPA documents are produced in the Environmental Division in the chief of Policy and Environment directorate. The design plans are produced in the Location and Design Division in the chief engineer's directorate. The organizational structure in VDOT is as follows: secretary of Transportation, commissioner, deputy commissioner, and chiefs. The detailed VDOT organizational structure is outlined at this link: http://www.virginiadot.org/about/resources/vdotchartwnames.pdf.

WA DESIGN: NEPA documents are produced by the environmental office in each region, with information furnished by the project engineer offices.

WA ENVIRONMENT SVCS: The individual project-level NEPA compliance strategy depends on the size and scope of the project. Small projects are typically handled internally by the environmental staff within the lead WSDOT region or mode. Specific discipline support (like Endangered Species Act compliance) is often provided by the Environmental Services Office (ESO). Large, complex projects typically require a project team that includes in-house or consultant/contract environmental staff. The ESO organizational chart and ESO business plan were handed out at the meeting.

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

What software systems does your agency use to manage the project delivery process? What systems are used to capture project commitments and monitor execution and accountability after the completion of construction? How do you manage change (e.g. scope, schedule, budget, etc.)?

AZ: Primavera software manages ADOT project delivery. This software utilizes project information provided by the project teams and stakeholders to track critical milestones and communicate project status. Many other systems are in place to assist in the tracking and managing of the project delivery process, such as:

- Contract Management system (eCMS): An internal database which automates streamlines and tracks the consultant contract process.

- Estimated Engineering Construction Cost (E2C2): An internal program used to estimate construction cost at various phases.
- ADOT Information Data Warehouse (AIDW): An internal portal with many applications that assist in project development. Examples of those applications include:
  - *Project Folder/Reference:* Critical project documents from cradle to grave to be shared with internal and external stakeholders
  - *Photo Log:* Digital imagery of the state highway system
  - *RTPFP Dashboard:* Semiannual certification report for Maricopa Association of Governments (MAG)
  - *Predesign Portal:* Internal database used to document and manage through the scoping phase
  - *PPS Data Warehouse:* Tracks programmed and non-programmed predesign/scoping project schedules
  - *PMIS:* Internal database that captures projects commitments and documents through priority programming
  - *Field Office Automation System (FAST):* Internal monitoring tool that enables the design PM to review data, such as project budget and schedule and track supplemental agreements through the Supplemental Agreement Tracking System during the construction phase, which aids in capturing uniform documentation, tracks project contingency costs, provides enhanced reporting and trend analysis, allows on-line viewing of all aspects of the agreement, and provides feedback to the development process to improve the quality of the plans and specifications

ADOTS's Priority Programming Process *(PPP)* produces multimodal and intermodal projects based on performance measures that reflect the department's goals and policies and the needs of Arizona's stakeholders. PPP is an open process that allows the department to communicate its project selection internally and externally through the Five-Year Transportation Facilities Construction Program and provides for increased accountability through performance-based planning and programming.

The Project Review Board (PRB) is the first step in the ADOT Programming and Project Change Control Process. The PRB members assist the deputy state engineer for Development in overseeing the status of projects and in resolving issues that have been elevated for resolution through the escalation process. It elicits information from the Program and Project Management Section (PPMS) on projects that significantly deviate from their approved scope, schedule, or budget and evaluates the remedial actions proposed by the PM.

The Priority Planning Advisory Committee (PPAC) is a management committee appointed by the director in accordance with the Arizona revised statutes. The committee is responsible for updating and preparing the Five-Year Program.

The State Transportation Board (STB) sets priorities for needed construction or reconstruction projects within funds available. The department plans and contracts to add these improvements to the state highway system. The planning and development process for state-funded and federal-aid transportation facilities in Arizona includes the identification of public need; the determination of funding; and the planning, development, and construction of appropriate transportation facilities.

FL: District 4 uses Project Suite and Primavera. Project Suite is an internally developed product that that PMs use to manage scope, schedule, and budget. The rest of the districts are using Primavera and other application programs similar to Project Suite. The applications are being used at Enterprise or single project level.

MO: Projects begin on the district level and are input into MoDOT's in-house system for controlling the STIP called STIP Information Management System (SIMS). This program is used to capture the budget and letting schedule. Districts are limited to changes in the original estimate that are entered into SIMS and must justify and estimate changes. Changes in the bid year are also monitored and must be justified prior to being revised.

MoDOT then uses the AASHTO products (LAS, PES, and Site Manager) to bid and administer the contract. Actual payments to contractors are handled by an interface of Site Manager and the state Financial Management

System. When the project is complete, information regarding all of the actual costs associated with the project from Financial Management System is compared to program estimate information from SIMS to report the success in managing the budget throughout the life of the project.

These results are stored in MoDOT's Transportation Management System, which also houses road condition information and original project design plan information

PHX: Each of the four project managing departments uses different project management software systems. EAS uses a project management system called PROMIS to track project activity, scope, and schedule. PROMIS is a Web-based, database front-end that provides input screens and output reports for an SQL database application. We also use a financial software program called SAP to track the project payments and budget. PROMIS interfaces with SAP so we only have to look in one place for all the project data. We utilize the EASI document management system to scan and archive all the CIP project documents. PROMIS links with Microsoft Project software to provide project schedules for planning and management purposes.

The Streets Department uses two applications called Citizen Serve and Dashboard. Citizen Serve is used primarily to provide information systems and status reporting to the public. Dashboard is a project management application that also provides management information and status reports. The Water Services Department uses a project management system called Water Works. The Aviation Department has recently implemented the Skire project management system. Skire is an off-the-shelf project management system capable of managing a huge, complicated capital construction program.

VA: We use Dashboard, MS Project, and Primavera. To manage change, VDOT utilizes baselines and defined processes/approvals for authorized deviations for variances within and outside defined thresholds.

WA DESIGN: PDIS, PMRS, Primavera. PCRFs are used for change.

WA ENVIRONMENT SVCS: WSDOT now has CTS. The goal of CTS is to provide the ability to track individual commitments from their inception (usually in project development) through design, construction, and maintenance to their completion. Commitments incorporated in environmental documents include final NEPA/SEPA documents, permits, approvals, letters, and memorandums of understanding. Users must pull individual commitments out of NEPA/SEPA documents, permits, approvals, and letters and input them into CTS. This means itemizing the requirements within those documents. As CTS is completed, the tracking function will require the packaging and handing off of commitments from one office to another and noting the completion of commitments.

WA PCRO: WSDOT is in the process of deploying statewide Primavera P6 PM and Web PM, Primavera Contract Manager, Primavera Cost Manager, and electronic content management tools to help manage and report our project delivery. Along with training for these tools, WSDOT is also developing processes for using earned value in managing project delivery. WSDOT is in the process of creating project controller positions to assist in implementing earned-value management principles.

WSDOT uses the following systems to monitor project delivery:

- The Capital Program Management System (CPMS) is a mainframe application used to track scope, schedule, cost, and legislative commitments for all highway capital improvement and preservation projects.
- The Transportation Accounting and Reporting System (TRAINS) accounts for all WSDOT revenues, expenditures, receipts, disbursements, resources, and obligations. TRAINS data is fed into CPMS every night.
- The Contract Administration and Payment System (CAPS) maintains administrative and payment information about highway and ferry construction contracts. CAPS creates payment vouchers to pay contractors by feeding data to TRAINS.
- The Transportation Executive Information System (TEIS) is used for legislative budget planning and oversight. WSDOT uses TEIS to submit the requested transportation budget to the state legislature. The state legislature uses TEIS to transmit to WSDOT the approved transportation project list and baseline commitments.

- The Project Control and Reporting System (PCRS) is a database developed internally to support external reporting needs and expectations.

For managing change during the delivery process, WSDOT uses a project change management form to communicate and approve scope, schedule, and budget changes. For projects that are not line-item budgeted, changes are approved internally within WSDOT based on established approval thresholds. For line-item budgeted projects, budget and schedule changes rest with the state legislature when in session and with the governor's Office of Financial Management between legislative sessions (as long as the total cost of changes remains within the biennial appropriation). However, scope changes rest solely with the state legislature for line-item budgeted projects.

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

What systems are used to manage resources and determine when outsourcing may be necessary? Describe the nature of outsourcing in your project delivery process and how it is managed. Approximately what percentage of your design program is done by consultants? What percent of your CM is done by consultants?

AZ: Data from the scoping phase of the project development process is the basis for preparing the annual Five-Year Highway Construction Program. The MPD and the STB use the individual project purpose and needs, estimated costs, and development timeframes to establish priorities for constructing the candidate projects. The Five-Year Highway Construction Program becomes the guide for the remainder of the project development process and helps determine the resources needed to complete the project. During the design phase, the design PM will ask each involved technical manager to confirm the availability of in-house staff or on-call consultant resources for those activities assigned to the technical unit and to indentify the need, if any, for additional consultants. If in-house staff resources are available, they are permitted to do the work if they can meet the project schedule.

If outsourcing is required, an Approval to Advertise for Consultant Services checklist is required through the Engineering Consultant Section (ECS) and the Office of Resource Administration. ECS is responsible for organizing and overseeing the consultant selection process, including contract negotiation.

ADOT projects are categorized in System Preservation and System Improvements in the five-year program (resource allocation categories). System Preservation subprogram projects focus on the preservation and extension of the service life of existing facilities and safety enhancements. They are pavement preservation, bridge preservation, safety program, roadside facilities, and operational facilities. System Improvement subprogram projects include major capacity, corridor improvements, and high-priority projects. In general, system preservation subprogram projects are prepared and managed by in-house staff. Approximately 75% to 80% of our design program is done by consultants and managed by ADOT PMs. Between 30% and 35% of our CM is done by outside consultants.

FL: The statewide average outsourcing is 80%; however, it varies between districts. The decision-making process is basically already done—they will outsource most of their work. Over time, they have changed organizationally so that they are not able to go back and do all the design. They are trying to maintain some in-house staff with skills so that they can manage the consultants effectively.

MO: After a project is added to the STIP and it is time to begin preliminary environmental work, preliminary design, or other work, the availability of internal staff is reviewed by the district engineer to determine if the resources are available internally. Surrounding districts may also be considered to provide additional staff and skills as needed. If MoDOT's current workload is such that staff is not available, or if specialized skills are needed that MoDOT does not have, a request to solicit for a professional service provider is sent to the Professional Services Committee for approval.

Most consultant work is for road and bridge design and specialized environmental work. This depends on funding levels. A reduced budget generally results in more work being kept in-house. Generally, 20% to 25% of the engineering may go to consultants. None of our CM is done by consultants. Some construction inspection may be outsourced for the economic recovery projects due to the sudden surge in construction.

PHX: Design and construction for all new capital construction projects and most major maintenance activities are performed by outside consultants and contractors. The city does very little internal design and construction (probably less than 5% of the total program) using internal forces. The Streets Department performs both general and preventive maintenance activities using city crews, but those projects are typically small and don't require any design services.

There are a variety of reasons for this approach. On the design side, it would be difficult to maintain a qualified staff of city employees with the variety of specialty disciplines to design the large, complex facilities that the city requires. Phoenix recently completed the $600 million renovation and expansion of its convention center. That project required a design team with 50 different design sub consultants, ranging from interior architecture to food service to security systems to building automation systems. Water Services facilities also require very specialized design knowledge that would be impossible for the city to hire. The Aviation Department recently completed an inline explosive detection system and is currently constructing a multibillion dollar automated train system, more examples of specialized design that cannot be provided by city staff.

As for construction services, Title 34 of the Arizona revised statutes limits the amount of work that can be done by city forces. For vertical building projects, the city can only execute projects with less than $17,500 in labor costs with the requirement that any materials used in the project be acquired through a competitive bidding process. For infrastructure projects, the force account limit is increased to $150,000 for direct project labor, again with the requirement for competitive procurement of materials and equipment.

As was already described, the EAS Department manages the procurement of all designers and construction contractors for the city in accordance with Title 34. Title 34 provides three methods to select and hire designers. For smaller projects (i.e., a fee less than $250,000 for architects and $500,000 for engineers), an owner can use direct selection or an annual services approach. Annual services is a standby process where designers are selected biannually for a broad category of projects and are then selected for selected projects on an as-needed basis. By dollar value, probably 99% of city projects are designed by consultants. For larger projects, design professionals are selected through a project-specific, qualifications-based selection process. The city's selection process for design professionals is compliant with federal procurement processes.

VA: iPM, iSYP, and virtually all functions are outsourced to some degree. In terms of dollar value, 65% of L&D design is outsourced to some degree. Construction management is performed by in-house and consultant staff and 40% to 50% of construction inspection is outsourced.

WA DESIGN: We do workforce projections using Excel spreadsheets, Primavera, PMRS, and resource loading to some extent.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

What are the keys to your success in your project management process? What lessons learned can you offer other transportation agencies as they seek to be more effective? How has your project management process added value to your delivery of projects?

AZ: Flexibility is critical. The best-laid involvement strategy developed at the beginning of a project may need to change as the process evolves and issues unfold. This change does not indicate a failure of the plan. Data from the planning/scoping phase of the project development is the basis for preparing the annual on-line Five-Year Highway Construction Program, which helps determine the resources needed for program transparency. During the planning/scoping phase, early and continuous communication with and input from stakeholders is essential. Partnering with internal and external stakeholders throughout the project management process is vital for continuous process improvement. Significant use of a well-qualified consultant to help design and manage projects has contributed to ADOT's success in the project management process.

FL: FDOT trains its PMs to use guidelines and tools (e.g., Standard Scope of Services and Man-Hour Estimating)

to help them work with administrative issues with their consultants. Extensive training is also provided to their design and project management staff for using DB, DBB, CM, PPP, and other project delivery methods during construction to provide the most appropriate method for each project.

MO: The keys to success have been accountability and a well-developed sense of ownership in the project. In many cases, this has encouraged PMs to take calculated risks to increase the value of their projects. The one-stop-shop concept has proven to be popular with the general public as well as with the consulting and contracting communities. Lessons learned include the ill-fated dissolution of the design squad concept in favor of the employee pool concept. Within two years of implementation, most districts had returned to using design squads. Another learning experience came from repeated tries to force all PMs into a one-size-fits-all project tracking software system. When MoDOT turned its focus to more results-driven pursuits, PMs excelled on the merits of their individual strengths and preferences.

The project management process has added value to project delivery by placing personal responsibility above all other concerns. Once that sort of ownership is established, factors such as budget, schedule, public input, STIP commitments, and value are all dealt with efficiently and appropriately.

PHX: The city's overall key to success in project delivery is to use the most appropriate delivery method for each project. The city utilizes all of the project delivery methods provided by Title 34, including DBB, DB, CMAR, and JOC.

Straightforward projects without overly complicated design elements are good candidates for the DBB method. Projects with complex design elements that are extremely time sensitive are candidates for DB. CMAR can be used on a variety of projects that benefit from the early involvement of the contractor, who can work with the designer to define and scope a project to fit within available funding. Small, repetitive projects are candidates for JOCs.

Most STD projects are best delivered using the DBB method. Street projects can be designed and detailed sufficiently to ensure that bidders fully understand the project scope and specifications so they can provide complete competitive bids. The Street Transportation Department has also made extensive use of JOCs for smaller repair and maintenance projects, typically well under $1 million in size.

The STD's success in delivering construction projects has come through years of experience. Over the past few years the department has refined its project management capabilities through a vigorous process improvement program. In the past four years the city has quadrupled its federal funding capacity and obligation authority. We have developed a comprehensive internal technical committee to develop, review, strategize, and submit federal transportation grants. The city has primarily placed first in almost all categories available for the allocation of MAG federal funds. Extensive planning and selecting the right project for the right federal grant application is crucial for a successful grant and ultimate implementation of such projects.

To implement a federal aid project, the city first has to appropriate the granted federal aid share and also the city's share of the funds. Typically, all federal aid projects have a local match. In most cases, the federal aid funds are utilized primarily for construction, and the local match is used for design and administration activities needed to process a federal aid project.

On the technical side, we try to bring competitive projects to the table. What makes an application competitive (i.e., credible)? The following are some questions we ask about a proposed project:

- Can the project be sold as regional in any way? Does it cross jurisdictional boundaries? Is the street, intersection, park and ride, etc., serving customers who travel from other jurisdictions?
- Does the project serve kids or low-income individuals (always a high priority for people deciding who gets the money)?
- Is the project time sensitive? Can you argue that the sky will fall if your city doesn't get the money this year?
- If you are asking for design money, do you have a plan and funding source to construct?
- If you are asking for construction money, do you have your design ready to go?

Although it has not always been the case throughout our history, Phoenix takes the time to prepare great applications with accurate budgets. We spend the time and effort to answer all of the questions and include color maps and photographs. We generate letters of support from community leaders, neighborhood associations, and other constituents. When public comment is allowed at a meeting where funding decisions are being made, we invite constituents who will benefit from the project to help make a pitch to the committee. It is much more credible to have a volunteer from the local bicycle club advocate for the bike path you hope to build, rather than the traffic engineer who is paid to be at the meeting.

When we fully understand the project from the planning perspective, then the project management process becomes a lot easier to manage.

VA: Our keys to success are involving Districts in the development of the adopted project management policy and procedures and support from the highest levels in the organization. The project management process has clarified the roles and responsibilities of individuals in the organization, has enabled process improvements, and has improved overall performance.

WA DESIGN: Executive support, executive orders, project management plans, accountability, and transparency make our processes scalable and simple. The use of project management plans have assisted with delivery and accountability. It has also helped with obtaining project endorsement by all affected.

WA ENVIRONMENT SVCS: N/A

WA PCRO: WSDOT has implemented statewide the requirements for project offices to develop and maintain project management plans (PMPs). To assist project offices, WSDOT developed a Web-based on-line project management guide for preparing PMPs. Additionally, WSDOT has developed a one-week Project Management Academy based on PMI principles to help prepare the next generation of PMs and directors.

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

What steps has your agency taken to integrate advances in automation and communications technologies? What are the measurable results of your actions?

AZ: ADOT Information Data Warehouse (AIDW) is a project portal with many applications that assist in the project development process. The Project Folder/Reference is an electronic, paperless filing system that is available to all internal ADOT personnel and key stakeholders. This system was designed to provide ready access to approximately 150 key documents and information applicable to an ADOT highway project (cradle to grave). This system provides the most current project information available to all ADOT personnel and stakeholders in a timely manner, reducing delay, confusion, misunderstanding, and conflict during the development of a project. It has enhanced project organization and teamwork within ADOT. There is also a historical file that can be referenced for lessons learned and accomplishments.

The ADOT Project Development Process Manual is a Web-based guide for everyone involved in the highway preconstruction activities. The manual provides an overview of the organization, a brief summary of responsibilities assigned to each group, and the process through which individual projects are conceived, developed, and constructed. The Web-based manual is a tool for cross-functional training, as well as succession planning for a next generation of workers. A forum has been created for ADOT employees to give them a voice and allow them to contribute, communicate, and interact based on lessons learned with the Project Development Process. Links have been established throughout the manual for handshakes of additional guidelines and procedures.

ADOT is breaking ground on the way the construction alerts and travel information are issued to its motorists. ADOT has chosen to implement two social media outlets, Twitter and Facebook. These are popular, free social networking tools that allow users to receive information and communicate with others in short text messages exchanged on their cell phones or by logging on to the Web, both of which can be done in a mobile environment.

Web conferencing, such as Webinar and GoToMeeting, are being utilized to enhance communication and partnering with internal and external stakeholders.

FL: FDOT believes it is doing a better job at the hand offs between environmental, design, and construction. Most, but not all, of the districts use the Hummingbird system. EDMS is one tool that the districts use to input data to manage their projects. EDMS (http://etdmpub.fla-etat.org) is a document management tool, not a project management tool. An electronic comments review process is in place and used statewide. ETDM is used to track environmental commitments and comments. It is used statewide and also by resource agencies. The public access screen is read only.

MO: MoDOT advertises projects via the Internet. Contractors can view, download, or order printed sets of plans, via a third party vendor, on MoDOT's electronic plan room. Bids are received electronically via BidX. Resident engineer offices utilize wireless capabilities when possible to keep contract records via Sitemanager. The offices also transfer correspondence and contract information to contractors via e-mail and store files on a secured network drive.

PHX: EAS has implemented the Building Information Modeling (BIM) system on recent major vertical construction projects, such as the downtown Sheraton Hotel, the Phoenix Convention Center (PCC) expansion, the ASU School of Journalism, and the Police Crime Laboratory. Use of BIM and the early involvement of selected subcontractors engaged in a design-assist role during the design phase of the project have yielded vast benefits. We have seen an improvement in project communication and collaboration, a reduction in RFIs, smoother project scheduling and construction, a reduction in claims and rework, a reduction in project scrap and waste, and improved morale among the project team members.

Using qualifications-based selection delivery methods, we have seen a decrease in claims and lawsuits on our CIP projects. They establish a cooperative and collaborative atmosphere where the entire project team is focused on delivering the best project for the citizens of Phoenix.

The project team works out problems together, stays within budget, and delivers a quality product on time.

VA: We implemented a transparent and collaborative project environment that included streamlines and automation, issue identification and resolution, and a document management component. The results are improved communication and the bottom line in development and delivery of projects, as measured in Dashboard.

WA DESIGN: SPMG, PMRS, and communication plans.

WA ENVIRONMENT SVCS: N/A

WA PCRO: WSDOT is in the process of deploying the Project Management Reporting System (PMRS) statewide. PMRS is a system that will provide WSDOT with tools necessary to enable staff to deliver capital projects effectively and efficiently on time and within budget. It is being designed to provide accurate, transparent, effective, and efficient reporting. Deployment of individual software tools started in the summer of 2008; full integration is scheduled for early 2010.

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

What does your agency do to identify and manage project risks during the development and delivery process?

AZ: Early scoping and partnering of projects assists in identifying risk prior to designing the project. At the time of the design kick-off meeting, representation from participating ADOT sections, technical leaders, the cognizant district office(s), FHWA, engineering consultants, and other local, state, and federal agencies attend to confirm project roles and responsibilities and coordinate the schedule, including the delivery of design data between technical units. A variety of unanticipated issues can cause cost and schedule variances requiring adjustments to both the schedule and programmed amounts. The PRB and PPAC are responsible for monitoring the status of the Five-Year Program and recommend amendments to the Program for approval by the STB.

Under the direction of the Deputy State Engineer for Planning and Engineering, the PPMS establishes a master schedule and database of all projects presented in the Five-Year Program. PPMS also maintains and monitors a file of the current estimated costs for each project in the program. These costs are monitored for variations from

the programmed costs. The schedule status of each project is monitored and reported monthly to determine variations from the Five Year Plan, while cost estimates are verified at each stage.

Joint Project Agreements or Intergovernmental Agreements are executed to protect the state and reduce project risks when a joint effort between ADOT and other governmental agencies (or private entities). A Joint Project Agreement can address development, construction activities, and/or maintenance activities associated with the project.

FL: FDOT has used the Washington CVIP model on both I-4 and on one or two other projects. Most of the risks relate to the maintenance of traffic for interstate construction. We have a tiered risk assessment process. One level is done at the district (< $100 million) and the second is done with help from central office staff (> $100 million). These thresholds can be adjusted depending on project characteristics.

MO: The broad diversity of the core team has proven to be very effective at identifying risks that may have been hidden from the individual. Regular district project status meetings and statewide major projects meetings keep the dialogue with department leadership open and frequent. Finally, a newfound open communication platform with industry has helped to minimize risk in a greater way than ever before.

PHX: Risk during design and construction projects can take on many forms. Risk is difficult to define and communicate, hence is difficult to manage effectively. The city attempts to apply the universal concept of risk management by attempting to allocate responsibility for a specific risk element to the entity best suited to manage that risk. Certain risk elements will always belong to the owner, such as the risk of differing site conditions. Other elements belong to the contractor, such as obtaining qualified craftsmen and ensuring adequate supply of materials.

The city takes routine actions to manage or minimize risks. For example, to ensure the marketplace has the resources to respond to projects when they are advertised, the city attempts to spread the award of projects evenly throughout the year. Projects aren't held and advertised at year-end, when they might exceed the capacity of well-qualified contractors and subcontractors.

Another basic risk management strategy is to use the appropriate delivery method. One unique difference between the traditional DBB method and the alternate project delivery methods is how those methods allocate various risk elements. For example, using CMAR and DB engages the contractor earlier in the project and reduces the bid risk. The contractor and subcontractors have an opportunity to interact with the design professional so that they fully understand the project scope and specifications before submitting their bids. The contractor can review the bids with the owner's involvement to ensure the bids are complete. CMAR and DB also allow the owner to review the suite of subcontractors who will be submitting bids. By screening low-performing subcontractors prior to bidding, the contractor is able to reduce the risk of subcontractor failure.

One common risk of the DBB method is that when the completed design is put out for bid, there is the risk that all of the bids might exceed the owner's budget. When that happens, the project is delayed as the designer value engineers the project back into budget and the project is rebid. CMAR and DB can avoid that problem by early engagement of the contractor during the design phase. The contractor can engage in ongoing pricing drills to ensure the project never exceeds the owner's budget, thereby averting the risk of overdesign.

VA: At every milestone and throughout the development and delivery process, risk is continuously re-evaluated and mitigating plans are implemented as necessary.

WA DESIGN: We require a qualitative risk management plan for all projects and a quantitative risk management plan for all projects over $10 million. This risk management plan is part of the overall project management plan. Here is a link to the Strategic Analysis and Estimating home page that contains information related to this question: http://www.wsdot.wa.gov/Design/SAEO/.

WA ENVIRONMENT SVCS: N/A

WA PCRO: WSDOT created a Cost Risk Estimating Management Unit to work collaboratively with PMs to review and validate cost and schedule estimates and assess risks for projects to support PMs who are under increasing pressure to deliver projects on time and on budget. This requires that an on-time date and on-budget figure be established. WSDOT recognizes that project cost and schedule estimates, in particular early cost declarations,

are more appropriately expressed, not as a single number, but as a range. To accomplish this, WSDOT identifies project risks and uncertainty; our products and services include:

- Risk-based estimating workshops:
  - CEVP®, Cost Risk Assessment – CRA, combined workshop with VE (VE-CRA/VE-CEVP)
  - Other workshops as requested and tailored to project needs
- Reports with actionable information that PMs and teams can use to proactively respond to identified project risk.
- Training in project risk management and risk-based estimating.

WSDOT also formed a Headquarters Estimating Unit to develop and maintain statewide estimating policy for WSDOT. The unit supports projects as requested:

- Provides training in estimating field
- Provides answers to questions regarding estimating
- Reviews estimates
- Leads risk analysis for project cost and schedule
- Is responsible for maintaining and providing technical support for E-BASE and Bid Tab Pro
- Maintains GSP libraries, runs lists, and is responsible for wage and GSP publications

The Estimating Unit keeps up-to-date with current practice in transportation estimating, evaluates new tools and techniques for use at WSDOT, and provides support and expertise to the CEVP/CRA program.

WSDOT also employs VE as a systematic process to focus on major issues of a complex project. A VE study uses a multidisciplinary team to develop recommendations for important design decisions with the primary objective of value improvement.

During the delivery process, PMs use the Risk Matrix developed as part of the Project Management Plan in managing project risk.

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

ROW, environment, and utilities are often identified as the main causes for delay. Does your agency have any process improvements or streamlining efforts underway on these topics?

AZ: The QPI Team has identified and is currently piloting an accelerated Stage Deliverable Checklist to align technical function deliverables so that key information is delivered earlier, allowing technical functions to deliver accurate, complete submittals with decreased rework. Geotech and Engineering Survey information has been identified as being needed early so that dependent technical sections (ROW, environmental, and utilities) can act early on their design deliverables. The benefit of early land survey is that the location is better defined early, allowing for better decisions and less rework and additional survey.

Reduction in Addenda: Late or incomplete deliverables result in extra addenda at the end of the design phase. We improve the design of projects by increasing the quality and timeliness of information, which ensures that the right information is delivered at the right time for optimum results and less delay.

FL: FDOT has gone ahead and done early clearing and grubbing contracts to get out in front of the major construction portion of the work. In addition, the state has paid for relocations to expedite their process. We have also found it to be cost effective to go out and perform our own utility location processes, which have been more reliable for our design work, as opposed to relying on the utility companies to give us accurate information.

We continue to believe that the ETDM is our most important tool for dealing with management of environmental

commitments. FHWA has participated in compensation for wetlands impacted by projects where no mitigation is implemented on the project, rather than through an off-site mitigation program.

MO: The environmental process for utilities and road construction has recently been changed so that environmental and cultural resource permits and clearances can be obtained for both the road project and utilities. The merging of permits and clearances is negotiated during project core team meetings, and joint applications are made when they will make the process for both entities more streamlined.

Additionally, the utility clearance process has become more streamlined in several ways; for example, by involving partners earlier, being more open to allowing alternative materials, and employing subsurface utility engineering when appropriate.

PHX: EAS has an Environmental Section and Utility Coordination Section in-house for just that purpose. The Environmental Section does assessments during the land purchasing process to identify and mitigate asbestos, lead paint, or other environmental concerns. The Utility Coordination Section works with the various private utility companies to provide needed utilities to the city project. We bring in both of these groups early in the development process to minimize the impact of these areas on the construction schedule. For ROW issues, we work with the Street Transportation, Development Services, and City Real Estate groups to indentify and address any ROW issues.

The city has undertaken a number of initiatives to improve communications and relationships with utility companies, with mixed results. We implemented a Downtown Utilities Working Group to try to anticipate utility requirements to support downtown development. The group, led by the EAS Department, included representatives from several private utilities (APS, SRP, Cox, Qwest, Southwest Gas, and fiber-optic companies), as well as other city departments (Streets, Water Services, DDO, and DSD). EAS also engaged in a series of process improvement meetings with SRP and Qwest. These meetings seemed to improve communications but haven't achieved significant improvements in the field.

Real estate activities continue to be a challenge, both in the acquisition of new rights-of-way and in the negotiation of easements for utility relocations. We continue to work hard with all parties in an effort to reduce the impact on projects under construction.

VA: Involving the disciplines from the beginning, completing tasks concurrently with others whenever possible, continuously re-evaluating existing processes, and using creative/innovative approaches have been some of the key elements in mitigating the risks in these areas.

WA DESIGN: We usually identify these as risks on our risk management plan and then attempt to aggressively manage them. One improvement that has worked well is placing a railroad liaison at Burlington Northern Santa Fe Railroad. Another streamlining idea that has worked well is to use wetland mitigation banking.

WA ENVIRONMENT SVCS: In Washington State, we rely on joint NEPA and SEPA processes. Since 1999, Washington State has very effectively applied administrative delegation from Federal Highways that allows WSDOT to administer the simplest projects. The majority of our projects are categorically exempt. In the last biennium, we completed 954 projects classified as categorical exclusions under NEPA. Of those, 566 were signed by FHWA and 388 were completed by WSDOT without FHWA signature under our joint agreement. We have two legislative reviews (audits) of the environmental review process as it relates to transportation project delivery. The NEPA process was not found to be the cause of delay; major causes were funding uncertainties, design changes, lack of adequate agency staffing, new regulation, or changes in regulation. See links:

- http://www.leg.wa.gov/JLARC/AuditandStudyReports/Pages/Default.aspx
- http://www.leg.wa.gov/JLARC/AuditAndStudyReports/2005/Pages/05-14.aspx

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

Performance measurement

What performance measures are currently used to monitor the project delivery process? Which of these most influence your performance and decision-making? Please provide historical information regarding budget, schedule, and other performance measures you use to manage your project delivery process.

AZ: The ITD Strategic Plan outlines the goals, objectives, strategies, action plans, and performance measures to continually improve the safety, efficiency, and quality of Arizona's highway system and its intermodal connectors. ITD serves as the state's public entity responsible for design, construction, and maintenance. These activities are achieved through the Construction, Maintenance, And Development and Administration subprograms.

ADOT efficiencies are reported to the ADOT Director and Governor's office monthly, and a final summary report is submitted by September 1 through the Arizona Integrated Planning System (AZIPS).

The following measures are used to monitor the delivery process:

- Statewide Travel Lane Miles Open to Traffic: the cumulative number of actual state highway lane miles open to traffic within state of Arizona divided by the planned number of state highway lane miles open to traffic within state of Arizona.
- Board-Approved Construction Program versus Advertised Program: the cumulative number of actual construction dollars advertised divided by the revised board-approved construction program.
- Incident response time to the scene of level 1 incidents and call-back time both for urban (Phoenix only) and rural districts.

Internally, ADOT tracks the project delivery process through the Active Project Status Report for Scoping and Design. These reports illustrate the project status for all projects in the 36-month program, grouped by the bid advertised date. Valley Freeway Program certifications and MAG Annual reports address project delivery for Valley Transportation projects.

FL: Performance measures include:

- Project lettings (number and budgeted amounts)
- Acquisition of consultants (number and budget amounts)
- Acquisition of right-of-way parcels

MO: All of the project delivery measures are found under the tangible result for "Fast Projects That Are of Great Value". The measures below probably are the most influential in decision-making.

- Percent of estimated project cost as compared to final project cost
- Percent of projects completed within programmed amount
- Percent of projects completed on time
- Percent of change for finalized contracts
- Percent of customers who feel completed projects are the right transportation solutions

PHX: The EAS Contracts Section has developed a timeline for the procurement portion of the process. The Section tracks the time it takes from the initial Request for Services until the contract has been executed. By utilizing this procurement timeline information, we are able to provide better schedule information related to the procurement process to our client departments. The procurement process and schedule are key drivers in determining which delivery method to use. On the vertical construction side, we also utilize the PROMIS System, a project management information system, to track project progress regarding schedule and budget. PROMIS is a data management system that houses project-related correspondence, budget data, contracts, drawings, specifications, and schedules. The PROMIS database serves as a warehouse of information related to our capital projects.

VA: Our delivery process performance measure is our Dashboard on-time and within-budget metrics for preliminary engineering and construction. These measures are VDOT's commitment to the public to deliver the projects within the published timeframe and budgetary baselines. Prior to the launch of the initial VDOT Dashboard, the metrics were collected by functional groups and Management Analysis routinely analyzed budget/schedule performance and prepared executive-level reports for internal publication. The Dashboard introduced a transparency to VDOT's performance, while refining/automating the collection and reporting process.

WA DESIGN: On schedule and within budget. We require schedules for all projects with milestones identified and tracked.

WA ENVIRONMENT SVCS: Please refer to the agency strategic plan, project pages, and *The Gray Notebook* at: http://www.wsdot.wa.gov/accountability.

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

What are your definitions for on-budget, on-time, and other key performance indicators that you use?

AZ: On-Budget:

- Design: The design cost and final construction estimate come within anticipated costs as outlined in the Five-Year Construction Program.
- Construction is defined as final construction cost versus original bid award amount.

On-time:

- Design is measured by advertised date month/quarter through C&S.
- On-time delivery for construction is measured by opens to traffic date through the construction FAST database.

FL: The targets come from the Transportation Commission.

- 10% for budget
- 20% for time

We also grade consultants and contractors.

We do customer satisfaction surveys regularly.

MO: Those definitions are also contained in the Tracker publication.

PHX: On budget means the original project budget. On-time means the project is completed within the original project schedule. Primarily, the city utilizes a capital program that is built on a five-year CIP. The funding for a particular project is programmed up to five years in advance. The funding for various phases of the project (e.g., programming, design, and construction) may be spread across multiple fiscal years. The budget for a project or a phase of a project is for the completion of the entire phase of work, which may include contractual and noncontractual work. If a project is completed within the programmed five-year CIP budget amounts for the project or the total amount of the phased budget amounts, the project is considered to be on-budget.

With regards to schedule, the determination of on-schedule completion is primarily linked to the original construction schedule that is agreed upon prior to the start of construction work. Delays that occur prior to initiating construction on the project are not typically captured in the scheduling process.

VA: All definitions for the various measures in the VDOT Dashboard 3.0 are posted in the following guide: http://dashboard.virginiadot.org/help/DB%20user%20Guide.pdf

WA DESIGN: N/A

WA ENVIRONMENT SVCS: N/A

WA PCRO: For external reporting of commitments, a WSDOT project is considered on budget if it is within +/-5% of the legislative-approved budget. A project is considered on time if a reportable schedule milestone is achieved within the same calendar where the legislative-approved schedule milestone date is established. Also refer to The Gray Notebook at http://www.wsdot.wa.gov/accountability.

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

Are performance measures included as part of yearly employee performance reviews? Do you have a pay-for-performance system that is tied to project delivery metrics?

AZ: Performance measures are included in employee yearly performance review planners. Performance pay above base salary is provided if the following performance measures are met quarterly:

- Statewide Travel Lane Miles Open to Traffic: cumulative number of actual state highway lane miles open to traffic within state of Arizona divided by the planned number of state highway lane miles open to traffic within state of Arizona.
- Board-Approved Construction Program versus Advertised Program: the cumulative number of actual construction dollars advertised divided by the revised board approved construction program.
- Incident response time to the scene of level 1 incidents and call-back time both for urban (Phoenix only) and rural districts.

FL: N/A

MO: Yes, individual performance plans are linked to district/division performance measures that in turn link to a higher-level *Tracker* measure. The Performance Plus employee incentive program was launched in 2006. There are currently three active programs with two directly linked to project delivery metrics. One is tied to project estimates and the other to final project costs.

PHX: Yes. PMs have different projects listed on their performance management guides (PMGs) with milestones that need to be achieved during the rating period.

Yes. Middle managers and executives are rated on a Performance Achievement Plan (PAP). The better they do at achieving performance goals the higher their potential salary increase.

VA: Metrics are part of the performance evaluation process. Within the budget constraints and the guidance from the Governor's Office, bonuses and/or commensurate pay increases are possible within the constraints of the budget.

WA DESIGN: No and no.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

How are outside influences accounted for with your performance measures? These would include the environmental permitting process, public involvement, availability or lack of funding, utility agreements, etc.

AZ: To ensure that performance measures are not impacted by issues outside of agency and employee control, provisions are put into place to identify the types of variation that could exist during the delivery process. If the variation is identified as Common Cause, then no further steps will be taken and the results will stand. If the variation is identified as Special Cause, then those items will be evaluated. If it is found that the agency was able

to control the affecting issues driving the variability, then this will affect the agency measure. If it is determined that the agency was unable to control the affecting factors driving the variability, then this will not affect the agency performance measurements.

FL: N/A

MO: There are no special allowances within the performance measures for outside influences, such as the environmental permitting process, public involvement, funding problems, or utility agreements. Rather, division and district managers are expected to deploy strategies to address these as they occur within individual projects.

PHX: Project schedules try to build in time to address outside influences. We identify these influences early in the process and execute long lead items as soon as possible. However, there can be unforeseen surprises and delays beyond our control. We attempt to mitigate these situations and continue to work in other areas until the issues are resolved. In executing projects, the variety of external processes and approvals that are not under the direct control of the managing agency are considered. For the most part, prior experience on past projects with such processes and approvals are utilized to program a reliable and realistic schedule for the project.

VA: There is a limited opportunity for rebaselining projects if a specific impact is due to an action by the Commonwealth Transportation Board (CTB) or the Board of Supervisors (BOS). Also, PMs are able to post comments on the Dashboard documenting the specific circumstances.

WA DESIGN: Oftentimes, they are not. We try to identify these as risks and attempt to manage them as best we can. WSDOT has been focused on transparency, which has worked extremely well with building credibility with the outside influences.

WA ENVIRONMENT SVCS: It is a challenge, but we try to develop performance measures that get at the reality of our complex external approval and coordination efforts. We carefully track our project workload at the other agencies, including the work assignments of individual liaisons at other agencies. Placing staff in resource agencies is part of a WSDOT and FHWA effort to improve transportation project planning, permitting, and project delivery. This program provides specialists to work only on WSDOT and local agency transportation projects and issues such as early coordination on transportation permits, Endangered Species Act (ESA) concurrence, and environmental review. Some liaison positions are filled with WSDOT staff based at the resource agency, while others are resource agency staff funded by WSDOT.

We have performance reports from our MAP Team as well:

- http://www.wsdot.wa.gov/Environment/MapTeam/default.htm
- http://www.wsdot.wa.gov/NR/rdonlyres/53446123-7E9A-4A81-804C-89FB5B378FA8/0/MAPTperformRpt-JanJune083.pdf

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

How are state/local initiatives that respond to climate change impacting your project delivery process?

AZ: We are not aware of any state/local initiatives that require us to change our project delivery process to accommodate climate change. However, we have adopted some internal performance measures to address the impacts of climate change on our construction activities. We have a list of measures below:

- Support compressed construction and road improvement schedules and design activities (including landscape) by completing environmental clearances while meeting all regulatory requirements.
- Ensure that ADOT identifies less harmful alternatives to dispose of vegetation from right-of-way clearing operations.
- In the future ADOT will evaluate the following strategies to reduce the greenhouse gases:

- Building energy purchases
- Activities pertaining to solid-waste handling
- Consumption of natural gas
- Use of fleet fuel
- Estimating asphalt and concrete production greenhouse gas
- Use of sulfur hexafluoride
- Consumption of refrigerants

FL: We believe we are on the threshold on this issue. We recognize the need to do it and are placing some emphasis on our building standards. We are looking at which initiatives can be incorporated into our projects through a research project that is just starting.

MO: Thus far Missouri has not had any specific initiatives that target transportation for climate change. MoDOT is in the beginning stages of developing a plan for how it will address climate change issues.

PHX: N/A

VA: The future project delivery will be sporadic under the current budgetary constraints, and the strategic direction is repositioning to primarily system operation and maintenance.

WA DESIGN: N/A

WA ENVIRONMENT SVCS: WSDOT is addressing climate change in many ways. Environmental components are built into WSDOT's everyday operations, including construction, maintenance, and ferry activities. See http://www.wsdot.wa.gov/environment/climatechange.

We are active participants in the state's efforts, and our experts serve on the Governor's teams. We are fortunate to be viewed by the public and agencies as part of the solution—not just as the largest source of GHG emissions. In large part, our projects contribute important benefits by reducing stop-and-go traffic, improving transit reliability, and adding bike and pedestrian facilities.

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

Describe your efforts to share performance information with the general public and elected officials. What outcomes have resulted from your efforts towards transparency regarding your project delivery performance?

AZ: The Five-Year Program is a primary tool for communicating ADOT's plans with its external and internal customers, including the traveling public, the legislature, the local governments, contractors, and its own staff. ADOT efficiencies are reported to the ADOT Director and Governor's office monthly. The early involvement of Communication and Community Partnerships (CCPs) has built positive relationships and open communication with the general public.

Media Metrics for 2008:

- 2747: Total media mentions in statewide media (average of 56 per day)
- 668: Total calls from the media (average of 7 inquiries per day)
- 361: Formal news releases to the media and community

Successes are more specifically shared by news releases and project opening ceremonies. Transparency in the decision-making process has resulted in positive press, appreciation for our efforts, and support for our program.

The passage of the second voter-approved 20-year sales tax for MAG area freeway projects demonstrates the trust and respect that ADOT has instilled in the public.

FL: We believe that the most important measure for the public and elected officials is schedule.

MO: Tracker, Accountability Report, Annual Top 10 Achievements, etc.

PHX: EAS reports monthly to the City Manager the time it takes to process contracts and to process application payments. This information is made public when the report is posted on the City Manager's Web site. Annual audits are conducted on two CIP projects selected at random. The results of those audits are public record. We incorporate the recommendations of the audit to improve our project delivery. As a procurement and project management department, we endeavor to engage in frequent dialogue with our client departments on the status of their projects or program of projects. Monthly and/or quarterly, (dependent on the client department) EAS staff and management meet with client department representatives to discuss their projects. This venue is a source of valuable communication and constructive feedback with the client departments. We attempt, wherever possible, to incorporate such feedback into our work processes and procedures.

VA: By publically establishing business goals and measuring our performance, VDOT has restored the public's trust and confidence in our fiscal stewardship and our ability to deliver a safe and robust program.

WA DESIGN: Web sites, The Gray Notebook, open houses, public outreach, public support of WSDOT, and a better understanding from the public on project delivery. The public and elected officials have a much better understanding of what it takes to deliver a project.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

What lessons learned can you offer other transportation agencies regarding your use of performance measures and their impact on your project delivery process? To what do you attribute your success in project delivery?

AZ: Lessons learned on performance measures:

- Make it easy to administer
- Develop targets that are reasonable to achieve
- Utilize a family of measures to develop an index that encompasses agency-wide performance
- Develop a scale, scoring tiers, and targets for Performance Pay measures
- Weight measures at the division level (e.g., by # of FTEs)
- Normalize the measures by using moving average methodology
- Develop targets using historical benchmarks
- Conduct data analysis to ensure that measures are not impacted by factors outside of agency and employee control

The ITD Strategic Plan clearly outlines the goals, objectives, strategies, action plans, and performance measures so that all areas have the same focal point and know what is expected to achieve the agency measurements and successfully delivery highway projects. Valley Project management utilizes the MAG Life Cycle Program to focus on the needs of the regional freeway system and other Phoenix-area projects, which contributes to the success of their project delivery. The use of on-time delivery performance measures help develop and re-enforce an on-time delivery expectation and culture within the agency.

FL: N/A

MO: The department's primary performance measure, the Tracker, has given the public an all-time high level of confidence in MoDOT's ability to deliver the system. It has also increased the level of personal accountability among MoDOT staff.

PHX: Project management milestones should be monitored regularly. Project status should be updated by the PMs continually to ensure that the project stays on schedule and within budget. EAS sends out a post-occupancy survey to our client departments about a year after project completion. The survey provides feedback to EAS on what things went well and what areas need improvement. The overall comment received is that good communication between all parties leads to a successful project. As discussed in the previous question, when an agency attempts to implement new or innovative project delivery methods, it is extremely important to incorporate a reliable project tracking system and a strong communication link between internal and external stakeholders. By including both of these in the project delivery process, an agency is able to make its processes more efficient and comprehensive, while providing tools to evaluate results and conduct self-analysis.

VA: What is measured gets done. Having metrics in place allows VDOT to establish targets/goals and assess performance in core areas. Aligning limited resources with the key objectives is transparent and easy.

WA DESIGN: Be open to innovation, transparency, and early/often communication. WSDOT is very proactive at risk identification and management.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

Contracting practices

What innovative contracting practices does your agency use to improve project delivery?

AZ: ADOT has utilized the DB and ALB project delivery method for more than 10 years. Projects have also been administered under the CMAR and JOC methods for the past two years. DB, CMAR, and JOC projects are awarded under qualification-based criteria.

FL: DB, A+B, CMAR, (go to their alternative contracting Web page). Pushbutton projects are ITS and safety projects rely on a firm to provide a turnkey project.

MO: From communication avenues such as video conferencing to electronic document sharing, faster information sharing speeds, and improved project delivery. St. Louis District is also engaging in triangle teams of designers and construction personnel working with maintenance and area engineers to effectively communicate and deliver projects. Innovative contracting techniques are also used, including encouraging contractor competition and innovation with the following practices: balanced bid openings, spreading out projects of a similar nature, alternate pavement bidding, optional pipes, contractor alternate technical concept proposals, and encouraging VE.

PHX: Generally, our procurement procedures include a combination of various alternate delivery methods. As authorized by state law, Phoenix utilizes traditional DBB, JOC, DB, and CMAR. For both DB and JOC, state law permits the use of both one-step (qualifications based) and two-step (qualifications and price-based) selection methods. For horizontal construction work, the majority of projects are completed using the traditional DBB approach of the JOC process. Due to federal funding limitations, the use of the DB and CMAR delivery methods has been severely limited in horizontal construction. In vertical construction, all four major types of delivery methods are utilized regularly.

VA: PPTA, DB

WA DESIGN: DB and various types of bidding. Also, bundling of projects and specialized projects such as region-wide signing or guardrail projects.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: DB is our prevalent innovative project delivery method. Within the DB arena, we have tried a variety of innovations with varied results.

- Option pricing: We have used a variation on additive alternate bidding. The option bid prices are scored as part of the technical evaluation. Award goes to the proposer with best value, then the department selects from the options, in any order or combination, as funding allows.
- Best value/low bid: We have not done this yet, but will probably do one soon. Technical evaluation would likely be required but would be all pass/fail. Award to low bid.
- Bonds on megaprojects: The legislature is currently evaluation legislation to allow bonds to be less than 100% of contract amount for projects over $250 million. For these projects, we will require separate performance and payment bonds (in lieu of our traditional combined bond) because the separate bonds provide better coverage at the same cost.
- Streamlined RFQ and RFP process: Our short-list procedure and best-value determination procedure have started to get more streamlined as the department and industry have become better versed with DB. We have reduced the amount of information required to be submitted, and reduced the man-hours required to evaluate—both by focusing more specifically on what is important for the project.
- We are currently evaluating, and are likely to proceed with, issuing an RFP that executes a contract prior to completion of NEPA, in accordance with the 2008 changes to the federal DB rule 23 CFR 636.
- We are considering a single-step procurement (combined RFQ and RFP).
- We have used a structural steel escalation clause in a DB contract, which included a mechanism in the best value determination for increasing the proposal price for proposers that elected to use structural steel.
- We have used A+B (Price+Time) bidding for many years.
- Commodity escalation clauses: During times of rapidly escalating prices of certain commodities, we have provided escalation clauses. When prices level off or begin to decline, we stop. The indicator is usually industry clamor. We have used them for the following items/indices:
  - Structural steel—ENR commodity prices
  - Structural steel and rebar—ENR commodity prices
  - Fuel/U.S. Department of Energy—Energy Information Administration—U.S. on-highway diesel fuel price for West Coast #2 diesel
  - Liquid asphalt—an agency established index that is based on Poten and Partners (a service we subscribe to that provides pricing information
  - Structural steel—Bureau of Labor Statistics, Producer Price Indices.
- Lane Rental: We have long used a scaled-down version of lane rental for our urban/high-traffic impact projects, wherein the contract stipulates the allowable hours of lane closures at no cost to the contractor. We then assess LDs for lane closures that extend beyond the allowable hours. The LDs are stipulated in the contract, and are derived from a user delay analysis.
- CM/GC: We have used CM/GC, based on the AIA documents, for ferry terminal (vertical) contracts.
- Disputes Review Boards: We use a three-party board, very similar to the Disputes Review Board Association, on all DB projects and many BB projects over $10 million.

Does your agency utilize on-call consultants? How is this work distributed and what is the structure of these contracts?

AZ: ADOT has three types of on-call contracts:

- Temp Tech—Temporary technicians are called out by the district to provide qualified staff, supplementing project needs.
- Project Administration—Consultants are used to administer entire projects, in lieu of ADOT staff, reporting directly to district representatives.
- Materials Acceptance—This contract allows the state to bring a full lab, including equipment and personnel, on board to assist ADOT districts' construction projects in remote areas where no ADOT lab is available.

Currently, six firms are under contract, selected based on qualifications, Assignments are overseen by ADOT's Assistant State Engineer for Construction and distributed equally among firms.

FL: We use district-wide on-call contracts for emergencies and for small work. The districts have Fast Response contracts that facilitate their hiring of contractors for emergency purposes. They rate their contractors and use that grading system to determine who wins work in the future. By statute, they have to consider past performance in their selection of consultants

MO: Yes. Qualification-based selection is used to select consultants for each district in the categories in which work is anticipated. A Master Agreement is executed at Central Office that allows a district to write a Memorandum of Understanding (MOU) that can be executed in the district. Many smaller companies are selected for these projects (max. $100,000), and districts are asked to spread the work among the companies that are selected.

PHX: Yes. We have various types of on-call consultant contracts. Our major on-call consulting programs are focused on engineering (71 firms) and architecture (35). However, there are additional on-call consultants for other program areas, including archaeological, environmental services, construction inspection, soils and materials testing, cost estimating, and historic preservation. The EAS Department's goal is to be fair and equitable in the distribution of work among the various consulting firms. However, actual work distribution is based on utilizing the most qualified firm for a particular project. This is determined through a review of the firm's statements of qualifications and discussions with the client departments. Under our consulting programs, the contracts are established with a contract capacity dollar limitation. No work or minimum dollar contract amount is guaranteed to any consultant. To maximize the use of consultants under on-call contracts, the contract capacity for all firms is consistent and limited. Once a consultant has reached its contract capacity, that firm is taken off the list of firms eligible to receive on-call work under that contract. Work is issued under these contracts through the use of task orders. Each task order is negotiated for a specific project and specific services to be provided by a firm. The on-call contracts have prenegotiated labor rates. The only negotiation that is required for each task order is agreement on the list of scope activities and the labor hours associated with the completion of each activity.

VA: Yes, on-call professional services, engineering (e.g., design, survey, hydraulics, and traffic analysis), operations, maintenance, emergency services (e.g., snow removal), and adjunct bench for training and performance improvement. The contracts are established centrally within divisions (specializing in a particular discipline/function) and statewide within districts.

WA DESIGN: Yes. VEs, CEVPs, and CRAs. On-call based on invoice for approved scope of work.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: Yes, we use on-call consultants. Here's the link to our consultant liaison Web site:

http://www.wsdot.wa.gov/business/Consulting/. Here's the link to the on-call process, rosters, and task-order procedures: http://www.wsdot.wa.gov/business/Consulting/proceduresmanual.htm.

Does your agency have an office dedicated to innovative contracting/project delivery?

AZ: One of the duties of the Assistant State Engineer for Construction is to oversee the implementation of innovative contracting methods.

FL: The DB packages in the districts for stimulus money are being put together by the GEC. For smaller projects (bike paths, sidewalk) they do that in the district.

MO: Not specifically. There are individuals in the Design, Construction, and in some District offices who are champions for innovative initiatives, but no dedicated group. Sharing of innovative techniques with communication on all levels is important to get the word out that innovation can help control cost and allow more work system wide.

PHX: The Contracts Administration Section of the EAS Department works daily and regularly with all project delivery methods currently allowed under state law. In addition, EAS Department staff and management are actively involved in discussions with other state public agencies and industry groups on changes and/or improvements to the procurement sections of state law. The client departments that EAS serves are also very active and interested in developing new and innovative methods to delivery capital projects. In total, the EAS Department and its client departments cultivate an environment where alternate project delivery methods are not just accepted, but where these methods are pushed to the leading/bleeding edge to improve how the city delivers its capital program.

VA: Yes, the Innovative Project Delivery division.

WA DESIGN: N/A

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: Yes. It's currently staffed by two PEs: Bob Dyer, 360-705-7468, and Fred Tharp, 360-705-7816.

How has the project delivery process improved/evolved in your agency based on external and internal influences?

AZ: ADOT has modified its DB selection and administration process based on lessons learned and input solicited from the Arizona General Contractors (AGCs) and FHWA. The third edition of the Department's DB Procurement and Administration Guide was updated in December 2007. (See the Design Build Guide at http:// http://www.azdot.gov/Highways/ConstGrp/Value_Quality/PDF/DesignBuildGuide.PDF).

FL: After procurement, they contact and solicit feedback from the industry on how the process could be improved. We have a Construction Conference that includes industry (Florida Transportation Builders Association) and the consulting engineers in Florida. The agenda for the meeting includes many topics. Best Practices are always emphasized at their meetings, both internal and external. Time is a big issue, and that is what drove us to use contracting practices. Cost growth drove us to CMAR. We have adopted the menu of contracting practices to address our issues. DB was found to be very successful in managing time and cost control. We have not used A+B for years or lane rentals. Criteria for CMAR (District 2 has found success with Rest Areas and Welcome Centers.

MO: The project delivery process has most notably responded to external influences in the area of cost control. Performance specifications, optimization of letting schedules, practical design, value engineering, optional bidding, and ATCs have all helped to deliver the program under budget for the past seven years. This was accomplished in spite of the outside influences of funding shortfalls and cost increases in key construction materials.

PHX: When alternate delivery methods were introduced into city procurements in 2001, the only delivery method available to the city on its projects was the traditional DBB. The city was very involved in the drafting and passage of the legislation that added CMAR, JOC, and DB to the permitted project delivery methods. The city engaged in training and outreach to its internal city client departments and to the external consulting and contracting community. This early and extensive involvement in the alternate delivery methods laid a strong foundation for frequent and frank dialogue with both internal and external stakeholders. This communication process continues to provide valuable feedback on our procurement processes. These influences have refined our procurement processes as we have completed more procurements using the various delivery methods. Some of the feedback has also led to changes to the state statutes, with a major effort completed in 2005 and another one currently in process. Since the city has been very involved in the legislative process, its procurement process closely adheres to the intent of the procurement language in the state statutes.

Street Transportation has initiated a predesign phase element to the city's Transportation Federal Aid process. This has been influenced by Arizona DOT and just good project management process. This has enabled the city to ultimately get buy in by public and agency stakeholders to ensure that we have a good project. Also, due to the NEPA requirement, this predesign process helps define the scoping effort needed for the project to be successful, plus what is needed for the NEPA documentation for ultimate approval.

VA: The process is more agile, strong partnerships with customers and stakeholders drive the outcomes, and we benefit from more efficient and innovative results.

WA DESIGN: We are a cabinet agency now, so the approval processes have changed slightly. Several audits have been conducted on WSDOT, voted on by the public, and imposed by the legislature. Now, with limited budgets, all processes are being reviewed to make sure that they are essential and streamlined.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: The BB and DB processes have evolved as a result of both influences.

Describe your external relationships with the contracting community, engineering consulting firms and other industry participants and how those relationships impact your project delivery process.

AZ: ADOT's strong working relationship and communication with ACEC and AGC is instrumental in our project delivery process. Monthly coordination meetings along with the Annual Arizona Roads & Streets Conference, the largest annual event for Arizona engineers and contractors from the public and private sectors, foster this relationship. The AGC was a strong proponent of CMAR and encouraged ADOT's adoption of that process; ASU was also heavily involved in developing the framework. ADOT tapped the knowledge base of local cities and counties that had embarked on the process development earlier than the state. The American Council of Engineering Companies (ACEC) of Arizona was also instrumental in development of contract documents through participation on one of our subcommittees, recognizing the need to involve industry early in the design phase.

FL: Florida Institute of Consulting Engineers (FICE) and Florida Transportation Builders Association (FTBA) are our key partners. FTBA and FICE work with us on joint initiatives. Our relationships with both organizations have helped us advance innovative contracting methods such as DB. When we make major changes in policy, we work with both associations to work through concerns and issues.

MO: In short, these relationships can be described as communication, communication, communication! MoDOT holds regular meetings with the AGC and ACEC to find common ground on professional issues. We work closely with the American Concrete Pavement Association (ACPA) as well as the Missouri Asphalt Pavement Association (MAPA) to arrive at optimum pavement solutions. The Partnering for Innovative Efficiencies (PIE) efforts, discussed elsewhere in this document, helped form important bonds with industry.

PHX: It is a close relationship. City staff attends and participates in consulting and contracting industry committees and groups. The city also sponsors networking and outreach events for the consulting and contracting industry. These events maintain and improve the amount of honest communication and feedback

between the city and the industry on the public procurement process. The city has used the feedback provided to modify and/or refine aspects of its procurement processes.

VA: VDOT routinely collaborates on policy development and industry standards with the VTCA and others. The collaborative relationships strengthen the partnerships during engagements and positively impact the delivery process.

WA DESIGN: AGC, Washington Asphalt Paving Association (WAPA), ACEC

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: WSDOT has an excellent working relationship with industry. This has been facilitated by monthly (generally) meetings as shown below. These relationships have had a positive effect on project delivery because they have been used to implement new technology, Best Practices, and equitable allocation of risk.

- WSDOT/ACEC/AGC Committee for Design-Build
- WSDOT/AGC Committee for Contract Administration Issues
- WSDOT/AGC Committee for Roadway Issues
- WSDOT/AGC Committee for Structures Issues
- WSDOT/ACEC Committee for Structural Design
- WSDOT/WAPA Committee
- WSDOT/University of Washington/BST Contractors Association
- WSDOT/ACPA
- WSDOT/Washington Aggregates and Concrete Association (WACA)
- WSDOT/ADSC Association of Drilled Shaft Contractors
- WSDOT/Precast-Prestressed Concrete Institute

What metrics do you use to assess quality in both design and construction? Do you see a difference between in-house and outsourced delivery?

AZ: Presently, there are primarily three ways in which the department assesses the quality of the design:

- The tracking of the timeliness and completeness of each submittal through the completion of a submittal checklist prior to each submittal.
- An assessment of the number and type of review comments received on each submittal
- An assessment of the design through the number of addendums needed during bidding and the number of issues that arise during construction.

With all of these, there is little quantitative assessment of these factors. During construction the department tracks the quality of the project through the Construction Inspection Quantlist. A Quantlist is a qualitative checklist that converts attribute information to numbers, and allows for objective evaluation of construction processes. The intent of the Quantlist is to affirm quality requirements at the beginning of a project to ensure construction processes are in control and stabilized and that the product meets quality goals.

We are making a number of improvements through our QPI process. We are adding a quality measurement (based on the number and type of review comments received) to the submittal checklist so that we assess timeliness, completeness, and quality of each submittal. We are automating the checklist so we can readily compile and track

the results. We are also now tracking the reason for each addendum so that we can identify common problems and correct them. Finally, we are modifying our consultant evaluation process to more completely assess the quality of the documents produced, including at the end of construction and after one year of operation.

There is the general perception that in-house design is better than outsourced design, but even that can be very dependent on the personnel assigned, the design discipline, or the complexity of the project. In-house staff is inherently more familiar with ADOT requirements, likes, and dislikes than are our consultants. On the other hand, the consultant community typically designs our largest, most complex projects and is better equipped to meet short delivery schedules.

On DB projects, incentives were incorporated into the contract based on quantitative measurement of quality. The CMAR process allows for early involvement of the contractor to meld the constructability, phasing, and design to their particular firm's strengths—without sacrificing quality.

FL: There are no systems in place that compare in-house performance to outsourced services. Consultants are graded on the ultimate product. For design it is based on management, quality, and schedule. They are then given a score and that score is then used as an input to the selection process in the future. There are definitive/quantitative scores given. After the project is constructed, a construction grade is given. The final grade is then incorporated into their overall firm score. It is a 1 to 5 scoring system. Within each of the major categories are definitive measures against which their performance is judged. There is an appeal process if a consultant isn't happy with their grade. If a grade other than a 3 is given, then the evaluator is required to give a reason for the scoring.

The level of oversight for consultants who are functioning as PMs and doing design work for FDOT is high at first. Over time they require a similar level of oversight as do the in-house personnel. Many of the consultants are former FDOT employees who have extensive experience working within the FDOT with the department, standards, policies, and procedures.

MO: Consultants are evaluated at project milestones and at the end of a project. A Web-based database stores the evaluations so that they are available to all internal staff. When choosing consultants for new projects, the districts rely on the evaluations to reflect the quality of work completed by the consultant in the past. The consultants know that if they do good work, they will get more work. Construction engineering contracts are handled the same way.

Companies vary in abilities, and projects vary in complexity, so there are times when work quality may not meet our expectations, and additional time must be spent in review and coaching. On the other hand, MoDOT resources are limited and there may not be additional staff that can be added to expedite a project, where a consultant may have a larger design staff, or the ability to hire a sub consultant to get a large project done more quickly.

PHX: We outsource most of the design and construction for CIP projects. We only do in-house design on minor repair and maintenance projects. Our in-house construction is limited to that which is performed by the STD, PCC, and Public Works Department maintenance staff which are limited in scale by Title 34 (Arizona State Law).

VA: In design, an independent analysis of the quality is assessed and feedback is provided to the PM and team. Overall, there is no notable difference in the quality of in-house versus outsourced design. In construction, VDOT has a program that measures compliance with the contract plans and specifications (CQIP-160 projects/year and follow-up for each), and Contractor Performance Evaluation based on the quality, timeliness, compliance, and cooperation of the work performed. The consultants are an augmentation of the VDOT workforce, and product quality measurement is independent of the role of in-house versus consultant staff assignments

WA DESIGN: By the number of addenda, change orders, and claims. It varies from project-to-project on the differences.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: WSDOT has an evaluation process for consultants and contractors. This process does not have an effect on selection decisions. We are developing a process to evaluate design-builders, which is expected to be used in the best-value selection process.

Do you have a formal dispute resolution process? What is your experience with claims and litigation? Have your improvements to the project delivery process had an impact on your claims and litigation?

AZ: ADOT does have a formal resolution process—Standard Specification 105.21 Administrative Process for the Resolution of Contract Disputes ADOT has made significant progress in partnering with contractors (data tracked and provided by ADOT's Partnering Office). Recently, only one dispute has progressed to mediation and that one was then settled. Regarding ADOT's DB projects, five were completed with minimal issues. Those differences were settled earlier and at a lower level of management. One project was not as successful.

FL: FHWA's main contact with FDOT is at the district level. Formal partnering is used on special jobs that are complex, located in highly urbanized areas, etc., which is facilitated. It is a decision made on a project-by-project basis. FDOT has legal counsel in all of its district offices. It provides first-line legal advice to the district on a variety of issues. The attorneys work on technical special provisions, contracts, right–of-way acquisition, Joint Participation Agreements with local governments, and sign off on spec packages. FDOT's contracts and procedures address the issues of Errors and Omissions and contractual breaches by Professional Engineers.

MO: Yes, basic configuration is to keep disputes handled on the lowest level possible. MoDOT, generally speaking, has had very few claims over the past several years; we believe that this can be attributed to our dispute resolution process and relationship with industry to deliver projects to improve the system.

PHX: Yes. We have experienced claims and litigation. In moving from a program that depended exclusively on the traditional DBB delivery method, where the selection criteria for a contract is price only, to a program that utilizes a varied combination of the available delivery methods. When we bid projects with qualifications-based selection criteria; we have fewer issues with claims and litigation.

VA: VDOT has a formal dispute resolution and claims process. There has been no noticeable change in claims or litigation.

WA DESIGN: N/A

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: We have a State Claims Engineer who spends approximately 20% of his time working with the Office of the Attorney General on construction contract disputes. The formal protest/disputes/claims process is outlined in chronological order in our standard specifications as follows.

The protest process, in section 1-04.5, initiates written notification by the contractor and written acceptance or denial by the department by the resident engineer.

The disputes process, in section 1-09.11(1), outlines the procedure for the next step if the contractor is dissatisfied with the results of the protest process. This step provides for the use of a Disputes Review Board when mutually agreed to by the parties if a DRB was not established at the outset of the contract. This step is carried out by the resident engineer.

The claims process, in section 1-09.11(2), outlines the procedure for the next step if the contractor is dissatisfied with the results of the dispute process. Specific requirements are set forth regarding information to be provided to the state and timelines for seeking judicial relief. Section 1-09.13(2) provides for alternate disputes resolution methods when mutually agreed to by the parties. Section 1-09.13(3) requires mandatory and binding arbitration for claims under $250,000, using AAA rules.

We see fewer change orders on DB than BB, and probably fewer claims.

What training do you require to ensure that staff have adequate skills to procure and manage the

contracts, manage consultants, and other activities associated with project management?

AZ: ADOT staff is required to have completed Panel Selection training prior to participating as an evaluator. Also, Project Management training (cradle to grave) is required of all Resident Engineers and PMs. On-call firms engaged for construction management are required to acquire the same training mandated for ADOT personnel.

FL: The required training includes the Project Management training, but nothing else formal is provided. There is a lot of on-the-job training. The districts have the contracting authority warrants for the districts.

MO: While there is no formal training, the job requirements discussed elsewhere in this document generally ensure quality personnel in the PM position.

PHX: For the procurement of contracts training, the only required training is done informally in-house. Training is based on EAS Department Contracts Administration Section administrative procedures, state statutes, and desk procedures. The reason why the majority of formal training on our procurements is accomplished in-house is because design and construction procurements are governed generally by state statutes and are implemented specifically by each public agency. Many agencies have procurement processes that are similar to the Phoenix's, but none that are exactly like ours. Formal training is available locally by a university-sponsored group, but the training is focused on state statute requirements and Best Practices. In addition, staff has attended some formal training courses specifically dealing with federally funded contracts.

VA: Specific negotiation, consultant contract procurement, and consultant contract management training is required for all responsible for those functions.

WA: Consultant management training.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: Requirements are generally limited to a PE license. However, WSDOT has a well-developed training program for those who avail themselves. The Staff Development Branch of the Office of Human Resources is responsible for workforce development for WSDOT. This is accomplished through the organization of six primary training programs:

- Leadership & Management
- Technical & Professional
- Employee Development
- Maintenance
- Safety
- IT

To provide needed training and team building, these programs function cooperatively with:

- Discipline-related training curriculum committees composed of subject matter experts who recommend curriculum for job classifications and disciplines
- Internal organizations, management, and supervisors

Staff development professionals, in-house trainers, private industry consultants, and educational institutions provide the development and delivery of quality training activities to support the department's business needs. Of particular interest is the PMI at the following link: http://www.wsdot.wa.gov/Projects/ProjectMgmt/Training.htm.

Have you done anything innovative to ensure maximum competition on construction projects?

AZ: Although now a common practice in ADOT, contracts with similar types of work are staggered to enable more competitive bidding. Also, a recent specification used on selected projects allows contractors flexibility to choose the start date, optimizing their capacity to bid more jobs.

FL: We have had to work hard in the past to attract bidders, but that seems to have turned around. FDOT did advertising, reached out, and did many things to attract people to their work. Some changes are due to the economy. District 2 is particularly difficult because of its rural nature; bidders tend to be more geographic in their orientation.

MO: Alternate bidding such items as pavements and pipes has increased competition for projects. MoDOT routinely shops around for the best construction prices and routinely rejects bids that are believed to be excessive.

PHX: We have taken several innovative steps to ensure maximum competition. The first is the distribution of a procurement newsletter that is sent out to a subscription list maintained by EAS. State statutes require a procurement to be advertised in a newspaper of general circulation. EAS goes beyond this requirement with the distribution of its newsletter (monthly or more frequently as needed). The newsletter includes all consulting and contracting procurement opportunities and goes out to more than 2,800 subscribers. In addition, the city focuses heavily on industry outreach (as mentioned previously) and project specific outreach (both during advertisement and prior to advertisement, as needed). The intention of these outreach efforts is to ensure that as many consultants and/or contractors as possible know about our procurement opportunities

VA: Electronic plans that contractors may purchase on line, ask questions and obtain answers on line, all advertisements, bids, contracts, instructions, specifications, and forms are available on-line; if a contractor can bond it, the contractor can bid it, raising the bonding limit to $250,000; regularly conduct outreach to DBEs and job fairs. We also created Business Opportunity Workforce Development, which helps small and disadvantaged businesses learn how to bid on VDOT jobs, and made the list of plan holders available on-line by each job.

WA DESIGN: We continue to strive to be a good owner. WSDOT takes most of the risk instead of passing it on to the contractor.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: Nothing in particular for typical structures/grading/paving contracts. For specialty projects, we have sent out requests for letters of interest, pre-ad project meetings with industry, use of the Internet and newspapers, etc. We also try to maximize competition by working hard at maintaining a level playing field on all projects prior to and after award.

What lessons learned would you share with other transportation agencies based on your experience with your contracting practices? What would be the one thing you are most proud of in your contracting practices?

AZ: It is recommended to involve the contracting industry in developing your alternative delivery methods. The DB process has evolved through the years due to lessons learned. The two-step selection process now retains the same panel to evaluate both steps; this has enhanced the continuity of the review process. Another example is to allow discussion of ATC proposals with the appropriate departmental technical group. These process improvements have been incorporated into revisions of the DB Procurement and Administration Guide (see the guide at http://www.azdot.gov/Highways/ConstGrp/Value_Quality/PDF/DesignBuildGuide.PDF).

ADOT is proud to have been the first state highway program to incorporate CMAR as a project delivery alternative. Two state projects have been delivered, and the first FHWA project has been approved. It is recommended that when an agency wants to develop its CMAR process that it bring onboard qualified subject matter experts. Agencies need to be aware that more commitment is necessary upfront as opposed to DB (i.e., modification of contract and staff skill sets are greater in the CMAR environment).

FL: Our bywords are fair, open, and competitive. FDOT puts a lot of effort toward putting out a bid that meets these criteria. We attribute some of our success to the electronic bidding process as one of the reasons we are successful in bidding our projects. Electronic bidding allows FDOT to send out the changes that we need to make electronically and get them out to all plan holders. FDOT is focused on meeting its customer's concerns.

MO: Experience has shown us that opening the door to competition and innovation by working with contractors to roll out specifications and practices leads to efficient project delivery. Of course, industry and owner will not always agree, but our dialogue is open and timely to ensure that the Best Practices can be shared and used to get the best value for every dollar spent.

PHX: Learn what delivery methods are best used for particular projects. The city does not use a one-size-fits-all approach to its delivery methods. It takes time and experience to learn which delivery methods work best for each project or each type of project. The city was on the bleeding edge for public agencies in Arizona in implementing alternate delivery methods. By being flexible and adaptable, we have been able to tailor our procurement processes and procedures based on lessons learned in our quick implementation of the alternate delivery methods.

VA: The implementation of the Contractor Advertisement Bulletin Board has been valuable to both VDOT and the industry. In this environment, the contractor asks questions on line and receives a personal response. Additionally, all questions and responses are publically posted for all contractors to view. VDOT is proud of the excellent working relationship with the contracting community.

WA DESIGN: Feedback from contractors that they appreciated WSDOT being a good owner.

WA ENVIRONMENT SVCS:

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: In all forms of project delivery, WSDOT has worked hard to achieve an equitable allocation of risk between the department and contractors.

Community involvement

Does your agency utilize consultants to assist with community involvement?

AZ: Yes. Since the establishment of the Communication and Community Partnerships Division (CCP) in 2004, ADOT has been able to strengthen its relationships with agencies, stakeholders and the general public and engage them proactively in all phases of multimodal transportation planning, design, construction, and operation. In early 2006, the division implemented a consortium approach that hired teams of multidisciplinary consultant experts to augment and extend the reach of CCP. This approach has also allowed ADOT to transcend to project-only approach, allowing the involvement and outreach effort to address broader, but related, relationship building and policy issues. Community relations PMs and PIOs work directly to manage the efforts of consultant teams and to provide strong alignment to division objectives.

FL: FDOT uses consultants extensively on its behalf in dealing with the community. They are allowed to do it all, including running meetings, meeting with the media, and other related activities

MO: Yes, when appropriate. Most recently, consultants were brought on board to establish Missouri's first on-line public meeting. That being said, in recent years, the department has taken great effort to have each district equipped with a well-trained, well-equipped public relations staff.

PHX: Public involvement occurs in a variety of ways. Some CIP projects are funded by bonds. These projects require approval by the voters. The city sets up a bond commission of residents and city staff to provide input and outreach to the community on which projects they feel are important. City projects that require zoning changes are sent to the various Village Planning Committees, which allow the public to comment on site requirements. City projects are presented in front of numerous public group and commissions (e.g., the Mayor's Commission on Disabilities and the Central City Architectural Design Review Panel). Our Neighborhood Services

Department notifies the community with door hangers and signage when city projects are being built in their neighborhood.

The STD uses Public Information (PI) consultants during the design phase for our larger street and bridge projects. Public meetings are typically held to inform the citizens of what the project entails and to gather input from them. During the construction phase of all Street Transportation projects, PI consultants are used to notify the affected residents and businesses of the upcoming project. On the larger projects, public meetings are held prior to the start of construction. The PI consultants work with the citizens, property owners, and businesses during construction to address their concerns and issues. A hotline number is also provided on all projects.

VA: It is determined on a project-by-project basis whether a consultant will be utilized to assist with community involvement. The major projects typically do utilize or augment with consultant staff.

WA DESIGN: Sometimes we use a communication consultant; however, the majority of the time, we use our in-house staff. Each region has a communications officer and staff.

WA ENVIRONMENT SVCS: Yes, we do use consultants as well as our internal communications professionals for public involvement and communications.

WA PCRO: N/A

WA COMMUNICATIONS: Yes, we many times have consultant support for both our large projects and offices that support multiple programs of projects. We generally will have a WSDOT person that leads the communication/community involvement effort.

WA CONSTRUCTION: N/A

What tools does your agency use to communicate to the public (e.g., television, print, etc.)? Which tools do you use and how do you assess the effectiveness of these tools?

AZ: The agency uses state-of-the-art communication techniques and an integrated strategy that is tailored to each specific situation. Techniques include:

- Print and graphic design (e.g., brochures, handouts, and posters)
- Door-to-door information distribution
- Video production
- Podcasts
- Up-to-date project information on the agency and project Web sites
- Audio and electronic weekly closure updates
- Project video clips, such as for the construction of the State Route 87 and I-10 improvements
- Regular updates about traffic on Twitter
- Maintenance of a blog at AZcentral.com
- Project simulations to understand implications
- 3-D visualizations that show how a project will be developed
- Electronic news
- Regular updates via comprehensive public databases
- Small-group, on-to-one, and organizational presentations

The goal of ADOT's communication effort is focused on increasing project understanding as well as public education of the overall transportation plan and challenges facing transportation needs in the state. The

agency recognizes that communication must be two-way. ADOT regularly solicits feedback from the public through its Web site, at project meetings, and through direct interaction. Contact ADOT (also called ENVOY) is a tool that documents, coordinates, and tracks responses to public comments received through the Web site or the agency's constituent services officers. CCP is the agency's point of contact for all outward-directed communication with the media and public. PIOs assigned to ADOT district offices have extended CCP's reach throughout Arizona. All media inquiries are directed to the ADOT Media Hotline (1-800-949-8057), and protocols have been established that ensure information is communicated effectively and that any required follow up occurs.

Another important role that the statewide PIOs play is communication and outreach with the public. These individuals are visible within the regions and, as a result of being located within the districts they have a greater understanding of the technical aspects of projects as well as an understanding of regional issues. As a result, they can translate very technical information in an easily understood and region-appropriate manner.

FL: FDOT has found it is better to be proactive than to be reactive when dealing with the public. We believe that the use of tools should be governed by the need as opposed to using a tool for a tool's sake. We do have a public involvement handbook that we use to help guide suggestions for specific activities. This handbook is published by the central environmental management office.

MO: MoDOT uses as many tools as appropriate to the project, its locale, and affected interests to communicate the purpose and need of the project, the solutions identified, and the impacts associated with construction. That could include traditional media, direct mail, public meetings, public hearings, drop-in centers, stakeholder and agency coordination, and social media.

PHX: The STD uses several tools to notify the public of upcoming projects. Door hangers are used to notify affected property owners and businesses of upcoming projects. Notices are published in the newspapers regarding traffic closures and project impacts. This information is also used in radio and television reports. The effectiveness of these tools is measured by the feedback we receive from the public.

VA: VDOT utilizes available tools, including media (e.g., television, print, radio, and Web sites), kiosks, and project information pamphlets.

WA DESIGN: All of these and Web sites, *The Gray Notebook*, and public open houses. All are good as long as the information is accurate and timely. WSDOT has been using highway advisory radios, variable message boards, and real-time cameras on construction sites to inform the public.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: We use a variety of tools, including meetings, workshops, radio, television, newspapers, Web sites, blogging, Flickr, and Twitter. We use a number of means to measure success, from surveys, to the tone of the media responses, to e-mail, to blogging. This is a link to some of our outreach: http://www.wsdot.wa.gov/news/.

WA CONSTRUCTION: N/A

How has the use of CSS principles impacted your project delivery process?

AZ: A fundamental goal of CSS is collaborative stakeholder decision making. ADOT is committed to involving agency stakeholders and citizens as an integral part of the planning process. It is how ADOT does business. Some of the lessons learned from this approach include the following:

- Identifying all stakeholders early in the process and developing a public involvement plan that defines the opportunities for involvement reduces stakeholders from being surprise by project activities.
- Interacting and closely communicating with stakeholders lets us identify and address problems more quickly.
- Tailoring the involvement process to the specific process phase ensures that the public understands when and how input can be provided.

- Monitoring the dialogue throughout the process ensures that the public has an understanding of the project and that general acceptance is maintained.
- Maintaining close communication and interaction with stakeholders reduces problems that may cause project delays and increased budgets.

Additionally, as a result of this interaction, innovative solutions to problems are often identified.

FL: We believe that the principles of CSS are already incorporated into our design process. FDOT spent a year preparing the one-page policy that eventually went to its board. It is more than design issues. It is an awareness of community issues, such as when to build sidewalk projects (during the summer and not when it interferes with children going to school). Below the broad policy level, it is considered as a part of our approach to project delivery.

MO: At MoDOT, CSS is defined as tailoring a project to fit its surroundings. For instance, a 44-ft.-wide bridge wouldn't be built on a route that had a 20-ft.-wide roadway for miles on either side of it. This practice of producing solutions that exactly meet the purpose and need of the project, no more and no less, has come to be known as practical design. At its core, however, practical design is believed to be the purest form of CSS. As such, CSS has profoundly impacted our project delivery process in a positive manner.

PHX: Street Transportation interfaces with the public in all phases of the federal aid process. This starts with creating a solution for a transportation need or enhancement. Then we engage or continue the dialog with the major public stakeholders through the grant submittal process and eventual implementation of the solution (project). Within the MAG region, valley wide communities go through a vigorous competitive process for pedestrian/bicycle, IT systems, air quality, and safety project grant proposals. The grants are reviewed by the MAG's Technical committees for compliance and for obtaining federal funds. Upon acceptance of such transportation grants, MAG and Arizona DOT places them into the MAG's region TIP and Arizona's State TIP. Then the city continues working with the major stakeholders of the project through completion.

VA: We find that involving stakeholders and customers early in the process and influences the deliverables and the outcomes, yields higher satisfaction, and fosters a collaborative design process.

WA DESIGN: It has added a little more sensitivity to the design process. Helps look at the big picture on projects.

WA ENVIRONMENT SVCS: CSS principles are very helpful in our efforts to align our statewide transportation needs with local needs. Within the NEPA/SEPA process, we refer to the agency's direction on CSS when responding to public, tribal, and local agency requests. See http://www.wsdot.wa.gov/biz/csd

WA PCRO: N/A

WA COMMUNICATIONS: It adds time, adds costs, and adds options, but usually delivers a project that is better supported by the overall public.

WA CONSTRUCTION: N/A

What consideration is given to community involvement when developing project costs and schedules? Has there been an increase in either scope or budget due to a higher level of community involvement?

AZ: CCP has become an important partner when developing an initial project scope, budget, and schedule. CCP defines the level of public involvement and communication a project will require and the effort is embedded in the technical project scope. For example, through CCP's public involvement and communication efforts, specifications have been added to construction bids that ensure the public and agencies are well informed and construction impacts are minimized. Also the close community/agency coordination has facilitated more intrusive closures, saving time and money in a project.

As a result of a more holistic approach to communication and relationship-building, there has been a shift to a more strategic approach to community involvement. It is no longer a one-size-fits-all project approach that sometimes permeates the transportation field. This strategic approach and focus on strengthening partnerships have resulted in costs savings due to reduced project delays and backtracking. There is a cost for

the consortium process, but it pays for itself in improved customer service and generally more on-time delivery, which can also reduce other development costs.

FL: Community involvement is a significant part of the project development process. Input from adjacent property owners, neighborhood associations, and other concerned parties is critical to the complete collaborative process between FDOT and the community. The end product is more cost-effective when all factors are considered and parties are involved from the beginning as a team approach.

MO: Community involvement is a critical step in developing the project scope, cost, and schedule. After all, the public uses and pays for the projects MoDOT delivers. When tough decisions need to be made, MoDOT collaborates with local interests every step of the way.

PHX: We gather input during the design phase of projects and make every attempt to accommodate these requests. There have been several instances of increases in scope and cost due to the citizens' requests. A watchful balance between project scope, cost, and schedule is always considered with community involvement.

VA: Community involvement is fundamental and may increase or decrease the project scope and/or budget, depending on the specific outcomes.

WA DESIGN: Part of the communication plan is within the project management plan. With having this required communication plan, we do a better job of budgeting for performing this function. We sometimes identify community opposition to a project as a risk.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: Community involvement is a regular and committed part of our project development schedules and construction programs, and it is a requirement of our environmental processes. Project scope can be increased or, in some cases, better defined as a result of this effort. The links below are examples of some of our larger project home pages:

- http://www.wsdot.wa.gov/Projects/Viaduct/
- http://www.wsdot.wa.gov/Projects/SR104HoodCanalBridgeEast/
- http://www.wsdot.wa.gov/Projects/SR520Bridge/
- http://www.wsdot.wa.gov/projects/

WA CONSTRUCTION: N/A

How do you measure the effectiveness of your community involvement efforts (agency approval ratings, nature and extent of public involvement/engagement, etc.)?

AZ: ADOT has instituted a comprehensive partnering program that strengthens collaborative teamwork and allows project teams to achieve measureable results. This process provides structure for interdisciplinary teams to establish a mission and develop goals and objectives. Through the Partnering Evaluation Program software, the partnering process is monitored and problems are addressed immediately. This process has been expanded beyond project-specific partnering to include ADOT and agency stakeholder partnering. ADOT initiated the first formal agency stakeholder partnering process with the city of Mesa. This approach has expanded to other cities, government agencies, tribal government, and other stakeholders. Additionally, all projects have monthly coordination meetings that are conducted throughout the process. Agency stakeholders as well as technical disciplines and public involvement staff are included in these meetings. These coordination meetings allow input to be provided and information shared as well as ensuring project issues are discussed and solutions implemented in a timely manner.

FL: A customer satisfaction survey is the tool that we use to assess customer service. We are modifying our survey to reflect some new information we are trying to get from the public.

MO: MoDOT has a number of Tracker measures that gauge its customer satisfaction, both during and after the

project development phase (environmental or design) and following construction.

PHX: The effectiveness of community involvement is measured by feedback received before, during, and after the project has been completed. Our PI consultants keep logs of all calls, conversations, and correspondence relating to the project.

VA: Stakeholder and customer satisfaction surveys, stakeholder feedback, and public meetings.

WA DESIGN: Public open houses use rating forms/comment forms and overall project acceptance.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: We only check approval ratings occasionally, but we do gauge interest, Web site hits, articles, meetings, and contacts as part of our public involvement process. We also take feedback from a number of sources, including the media, the public and political individuals or organizations.

WA CONSTRUCTION: N/A

How do you measure the quality (success) of your project? How do you measure the acceptance of your project goals?

AZ: Quality is measured through project partnering as described previously and monitoring through regular monthly coordination meetings. At the end of a project there is a project close out, where a discussion of the entire project occurs and an evaluation is completed. Throughout a project, close communication and relationships with local leaders (i.e., local, government, school) helps ADOT track public views of the project and outreach efforts and identify any issues or concerns.

FL: We are doing the statewide customer service survey but do not do project-specific surveys or assessments.

MO: The primary success of the project is determined by the on-time and on-budget measures in the Tracker. In addition, each year the department conducts a telephone survey of Missouri adults in the same area codes as recently completed projects to determine if the projects were the right transportation solution. This is broken down by the size of the project and by district.

PHX: The success of our projects is measured by the feedback we receive from the citizens, property owners, businesses, and the public during and after the project. The acceptance of our project goals are measured by comments from the community and project team members while maintaining the project schedule and cost.

VA: The Dashboard metrics include on-time, within-budget, and customer satisfaction information.

WA DESIGN: On time, within budget, various milestones.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: Each project generally has a specific set of goals that we track concerning on budget and on time. We also perform programmatic checks for other important measures. Please refer to *The Gray Notebook.* Many of our larger projects have very specific goals that we measure against such as quality, environmental, traffic management, etc. (http://www.wsdot.wa.gov/Accountability/PerformanceReporting/)

WA CONSTRUCTION: N/A

What efforts do you employ to reach out to less vocal or visible stakeholders on your projects?

AZ: At project start-up, all stakeholders are identified, including those that may never attend a public meeting. A strategy is developed for each stakeholder group. Targeted communication efforts are employed and untraditional strategies, such as partnering with groups that represent a hard-to-reach, population are implemented. As part of a community analysis conducted before each project initiation, disenfranchised or dissociated groups within a project's vicinity can be identified and efforts tailored to specifically tap those

community members. The goal is to always have an interest in opinions, perspectives and concerns represented throughout the project lifecycle.

FL: We use newspapers, flyers, and mail-outs on project status to reach out to the less visible stakeholders and potentially impacted persons surrounding the project. Consultant PMs conduct extensive canvassing to reach out to spread the public involvement invitation to all stakeholders.

MO: MoDOT uses a core team in putting a project together, to bring a broad range of expertise to the project. One of the early steps is development of a public involvement plan. To start that effort, all potentially affected interests must be identified, followed by the appropriate tools that can be utilized to reach each of those interests.

PHX: Door hangers are distributed on almost every project to citizens and businesses that will be impacted by the construction. Each door hanger can be made available in Braille, larger print, audiotape or cassette. A 24-hour hotline number is listed on each notification. Also, our PI consultants meet with the businesses one on one to discuss the project and any issues that may arise.

VA: The press, targeted communication mailings, community meetings, anonymous surveys, and one-on-one meetings with stakeholders are all used to effectively involve the stakeholders.

WA DESIGN: Language translators. Try to hold open houses in locations where less vocal people feel comfortable attending. Allow for written comments instead of voicing concerns in front of everyone.

WA ENVIRONMENT SVCS: We consider community and social effects in all the areas of project development including construction and maintenance. We have a *Livable Communities Policy* that guides our work in this area. Some helpful references are our *Washington State Transportation Plan, Building Projects that Build Communities*, and *Understanding Flexibility in Transportation Design.* Our Highways and Local Programs Division has many other references that provide information in this area. Our environmental justice guidance is also on line at http://www.wsdot.wa.gov/Environment/EJ/Default.htm.

WA PCRO: N/A

WA COMMUNICATIONS: Opportunities for public involvement through community meetings, articles, folios, presentations, neighborhood meetings, mailed flyers (in multiple languages), drop-by visits, etc.

WA CONSTRUCTION: N/A

Is your community involvement activity centralized, decentralized, project specific, or managed in some other way?

AZ: The agency's public involvement and communication effort is centralized within CCP. However, to ensure that CCP has a statewide reach, it has embedded PIOs in ADOT district offices throughout Arizona and engages consultant teams to address involvement (aligned with NEPA), communication, and governmental relations activities as needed. The goal of the public involvement and communication effort is to transcend a project to ensure effective, meaningful involvement in multimodal transportation decision-making. An important result of this approach is consistency in public and agency coordination as a project moves from planning to construction. CCP staff provides consistency through all project phases and ensures that stakeholder and public issues are understood and communicated as the different technical disciplines get involved at various project stages.

FL: Our community involvement process is project-specific and is tailored to each project, community, geographical location, etc. The process is to engage each community as shareholders in the project. As the project matures, the shareholders have been a part of major decision-making early in the design stages.

MO: Our community involvement is addressed in the previous questions, although most community involvement happens, project-by-project, at the district (local) level.

PHX: Each project has its own unique and distinctive characteristics, making our community involvement project specific.

VA: It is addressed in the previous questions. It is centralized, decentralized, and project specific. Community involvement and communication occurs at all levels (e.g., VDOT, district, project, and program).

WA DESIGN: Decentralized and project specific.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: A combination of both decentralized and centralized. Most community involvement activities are decentralized and project specific. For some of our very large projects, our important messages and communication strategies and plans are coordinated for a centralized and consistent approach.

WA CONSTRUCTION: N/A

What lessons learned would you share with other transportation agencies that would lead to more effective community involvement? What would be the one thing you are most proud of in your community involvement efforts?

AZ: ADOT lessons learned are:

- Commitment at every level to the importance of community involvement and communication is important.
- Designated point of contact within the agency is critical in order to proactively plan and respond quickly if necessary.
- Flexibility is critical. The best laid involvement strategy developed at the beginning of a project may need to change as the process evolves and issues unfold. This change does not indicate a failure of the plan.
- Establish policies and procedures that identify the range of techniques and define the benchmark for involvement at various project stages.
- Ongoing training is important to ensure that the most up-to-date techniques are being employed in an effective manner.
- Effective community involvement has to become embedded in the agency's culture. It is how you do business and not just a hoop you are required to jump through.
- Transparency in the decision-making process builds trust and respect. Communicate how the input being provided is being used in the decision-making process. Report back so that people can connect the dots in the input provided and output or solutions being developed.
- If you ask for input, use it. If you ask for collaboration, respect it when it happens.
- People support what they have a role in creating. Involvement creates a sense of ownership. This expectation takes skill to manage.
- By having public relations and involvement experts, communication specialists as well as government relations professionals involved, the agency is provided an objective perspective regarding the project. These professionals can identify potential challenges as well as innovative solutions that the technical transportation team may not recognize.
- As one of the vital NEPA components, communication/outreach professionals should be regarded at the same high technical level as other specialized disciplines that are part of the project team. Indeed, these staff and consultants should not just be seen as the "party planners" and should be encouraged to operate at much higher tactical and strategic levels.

FL: Our policy of being fair, open, and competitive in spreading the collaborative community partnership is one of our most successful mantras. We found that being open and honest and listening to the public in early meetings was a key to a more successful partnering with the community. One of our more successful involvements is ETDM for environmental commitments.

MO: Our experience has shown the following efforts result in effective community involvement:

- Planning Framework—Incorporates customer input into the planning process. This nationally recognized process gives local officials and the general public a greater role in making transportation decisions for Missouri.
- Customer Service Centers—We have customer service centers set up in each of our 10 districts and the Central Office to serve the public by answering their questions, listening to their concerns, and providing requested information.
- Public Involvement—More specifically, we listen to our customers on specific projects through the public hearing process. At the initial onset of a project, the concept is introduced to the affected community, and the public is given a chance to provide feedback and voice concerns, objections, and approval. Various tools may be used, such as public meetings, mailings, drop-in centers, advisory groups, one-on-one meetings, stakeholder group presentations, and so on. The process ultimately concludes with official public hearings.
- Partnering for Innovative Efficiency—We recently hosted a meeting of industry leaders, government officials, and interested citizens to hear their ideas for improving transportation in Missouri. The meeting brought together 80 contractors, engineers, vendors, citizens, and public agency leaders to discuss how to produce transportation projects faster, better, and cheaper.
- Missouri Advance Planning—We're working to develop a long-range plan: the Missouri Advance Planning initiative, which will define what our transportation system could and should do for its citizens.

PHX: The main lesson learned is to involve the public as early as possible and make every effort to address their concerns and issues in a timely manner. The one thing that the STD is most proud of is the numerous compliments that we receive when a project is completed.

VA: Transparency through the Dashboard metrics, available 24/7, has been valuable and a fundamental change in how VDOT communicates performance and the status of its programs. Additionally, community outreach, including regular meetings with citizens, community leaders, localities, and CEOs, further strengthens the partnerships and collaborative spirit.

WA DESIGN: Listen to stakeholders and make adjustments to the projects when possible. Go out early/often and with accurate information. Improved public support of the projects.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: A combination of both decentralized and centralized. Most community involvement activities are decentralized and project specific. For some of our very large projects, our important messages and communication strategies and plans are coordinated for a centralized and consistent approach.

WA CONSTRUCTION: N/A

Additional Questions

Is there anything further that would be of interest to other transportation agencies that has not been covered by these questions?

AZ: ADOT has a very strong Engineer In Training (EIT) Program and Summer Intern Program. The EIT Program offers many advantages to individuals who wish to begin a career in civil engineering. We invest in the development of these EITs because we are preparing them to become Transportation Engineers for Arizona, and we are providing hands-on training, experience, and the opportunity to meet and network with many others within the engineering profession. The Summer Engineering Program gives college Engineering majors the opportunity to gain practical experience and earn money during the summer as interns with ADOT. The ITD assigns students to a variety of highway construction projects or to special studies within the division.

FL: Our success in project management is due to many internal and external factors. Use of product delivery methods, such as DB, DBB, CM, PPP, and others, has been a tremendous help. Project management office tools

for use by PMs and consultant PMs have reduced time and effort. Tools such as VE, Man-Hour Staffing Levels, Errors and Omissions procedures, and Project Management training, etc., are essential to produce the final product.

MO: Today's live presentations as well as the MoDOT Web site can provide volumes of additional helpful information.

PHX: As was mentioned in the response to several projects above, Phoenix has experienced great success in the application of alternate project delivery methods. One ongoing source of frustration is that these delivery methods are not generally available for use on federally funded projects. For transportation projects, the FHWA has required extensive justification through the SEP-14 application process to use any delivery method other than the traditional DBB method. The private sector has gone exclusively to negotiated contracting methods like CMAR and DB. When public owners have the option to use other methods, they also opt for methods that avoid the confrontational nature of DBB. Yet the FHWA hasn't seen the value of these methods despite ample evidence in practice and in research that demonstrate the advantages of these methods.

It would be very helpful if this scan could provide feedback to the FHWA to make these alternate project delivery methods routinely available

VA: N/A

WA DESIGN: N/A

WA ENVIRONMENT SVCS:

WA PCRO: N/A

WA COMMUNICATIONS: WSDOT is a national leader in the use of social media tools in facilitating a two-way conversation between the agency and the public. It has led to improved Web-based information and a better understanding of our reputation in the community.

WA CONSTRUCTION: N/A

What emerging issues are going to affect your project delivery process and measurement for success?

AZ: Arizona faces a budget deficit. Under executive order, ADOT has been operating under a hiring freeze for the past several months. Lack of resources (e.g., staffing and funding) and workload could affect the delivery process and measurements outlined in ADOT's current Strategic Plan.

FL: N/A

MO: The most obvious emerging issues all seem to relate to funding. The recession, market volatility, the economic recovery package, and the promise of a new highway bill are all factors that will likely continue to impact MoDOT's project delivery process for years to come

PHX: Lack of funding and price escalations of materials are major emerging issues. The use of alternative delivery methods would provide greater success for the city and its citizens in implementing federally assisted projects.

Direct funding allocation to the cities is more efficient than going through the ADOT for Obligation Authority. Phoenix is one of very few cities in Arizona that has Certification Acceptance exception for Environmental Clearance usually obtained from ADOT. Phoenix has the resources and expertise to produce the necessary documents for approval.

ADOT is a great partner that assists the city in implementing federal aid projects. However, due to the state budget shortfalls and staff shortages, it can be difficult to submit and process our documents for compliance with ADOT and federal requirements.

VA: The declining and unpredictable revenue future funding streams and the international and domestic economy.

WA DESIGN: Limited budgets

WA ENVIRONMENT SVCS: N/A

WA PRCA: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

What would be the most effective way to package and present the findings of this scan so that transportation agencies and industry would receive the most thorough and extensive distribution possible?

AZ: ADOT Internet, NCHRP Web site, AASHTO, Arizona Transportation Research Center (ARTC)

FDOT: Place the final report on your Web site and send a copy to all state DOT agency heads. Publish the report in project management, construction, environmental, and consultant newsletters and magazines. Send the report with the Executive Summary as a separate document.

MO: A good package might take the form of an easy-to-read, bound booklet backed by a convenient Web presence.

PHX: There are a variety of technology transfer methodologies to distribute the findings of this scan to other transportation agencies, including publishing technical reports, giving presentations at national professional conferences, and distributing on line via webinars. The use of technical journals and other transportation and public works magazines would be an effective way to present the findings.

VA: An executive summary and point presentation with key findings and recommendations, in addition to a detailed and comprehensive report, would be appropriate for the various audiences.

WA DESIGN: A good, clear, and timely report with an effective executive summary. Post this to the Web site for best distribution.

WA ENVIRONMENT SVCS: The summary report should report major themes. Benchmarking or similar graphical output is helpful so busy people can quickly scan the findings.

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

How will this information be passed from your agency to other transportation agencies in your state including local and regional entities?

AZ: The ARTC provides information to Arizona's transportation community. ARTC houses the ADOT Library that has 20,000 transportation publications and adds another 1,500 publications each year. The library maintains an on-line catalog, which can be searched via the Internet.

FL: We will place the final report on our Project Management Web site. Other offices (e.g., Construction, Environmental Management, Work Program, and Maintenance) will be copied and asked to pass the report on to their local contacts. Regional, county, and local agencies will be notified that the report is available on our Web site. Our in-house Research Office will receive a copy of the final NCHRP report.

MO: Usable practices will be examined and possibly worked into department policy.

PHX: We can utilize the MAG to inform the other transportation agencies and Council of Governments around the state. Other distribution methods described previously could also be used.

VA: VDOT would post results in the external Web site and communicate with its partners statewide to ensure the transfer of lessons learned.

WA DESIGN: Local programs, MPOs, and RTPOs.

WA ENVIRONMENT SVCS: N/A

WA PCRO: N/A

WA COMMUNICATIONS: N/A

WA CONSTRUCTION: N/A

APPENDIX E

Agency Profiles

Arizona

- 3,707,314,511 – Total gallons fuel sold '07 – '08
- 62,468 – VMT
- 2,172 – Auto Registrations
- 60,376 – Public Roadway Miles (6,813 – ADOT)
- Tolls:
- Total Road Miles - 0
- Bridges - 0
- Tunnels - 0
- Ferrys - 0
- 4,514 – Road Bridges (ADOT)
- 4400+ - # of employees
- 6,500,180 – State Population

Florida

- 203,741 – VMT
- 7,313 – Auto Registrations
- 121,995 - Public Roadway Miles (12,069 – FDOT)
- 41,000 lane miles and 6,381 bridges
- Tolls:
- Total Road Miles – 679.0
- Bridges - 14
- Tunnels - 0
- Ferrys - 0
- 5,319 – Road Bridges (FDOT)
- 7450 - # of employees
- 18,328,340 – State Population

Missouri

- 1 Toll Facility
- 1 Tunnel
- 6 Ferry Services (as of 2008)
- 19 Rest Areas /Welcome Centers

- 14 Port Authorities
- 1,050 Navigable Waterways
- 131 Public Airports
- 4,000 Miles Railroad Track
- 108 Commuter Parking Lots
- 68,834 – VMT
- 2,707 – Auto Registrations
- 127,205 - Public Roadway Miles (33,685 – MODOT)
- Tolls:
- Total Road Miles - 0
- Bridges - 2
- Tunnels - 0
- Ferrys - 7
- 10,276 – Road Bridges (MODOT)
- 6200+ - # of employees
- 5,911,605 – State Population

Utah

- 25,964- VMT
- 1,068 – Auto Registrations
- 43,769 - Public Roadway Miles (5,848 – UDOT)
- Tolls:
- Total Road Miles – 1.0
- Bridges - 0
- Tunnels - 0
- Ferrys - 1
- 1,710 – Road Bridges (UDOT)
- 1700 - # of employees
- 2,736,424 – State Population

Virginia

- 212 million VMTs annually, and within Virginia DOT's scope of responsibility, to maintain and operate, are:
- 58,000 miles of roadway (Interstate, Primary, Urban, and Secondary systems)
- 20,000 bridges and culverts
- 6 tunnels
- 3 toll facilities
- 4 ferry services
- 41 safety rest areas

- 10 welcome centers
- 107 commuter parking lots
- 81,095 – VMT
- 3,996 – Auto Registrations
- 72,331 - Public Roadway Miles (57,481 – VDOT)
- Tolls:
- Total Road Miles - 57.9
- Bridges - 5
- Tunnels - 1
- Ferrys - 1
- 11,768 – Road Bridges (VDOT)
- 8,300 - # of employees
- 7,769,089 – State Population

Washington

- 47 safety rest areas (28 Interstate, 19 non-Interstate)
- 56,517 – VMT
- 3,066 – Auto Registrations
- 83,256 – Public Roadway Miles (7,043 – WSDOT)
- Tolls:
- Total Road Miles - 0
- Bridges - 3
- Tunnels - 0
- Ferrys – 17 (10 Ferry Routes)
- 3,083 – Road Bridges (WSDOT)
- 7,132 - # of employees
- 6,549,224 – State Population

The City of Phoenix

The City of Phoenix was not included in this appendix due to the inability to compare profile information with the state DOTs.