

**STRATEGIES TO STRENGTHEN CONSULTANT MANAGEMENT  
IN THE GEORGIA DEPARTMENT OF TRANSPORTATION**

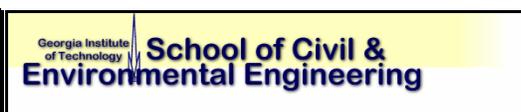
**GDOT Research Project Number 2020**

**TASK REPORT 3: A SUMMARY REPORT  
OF CONSULTANT MANAGEMENT  
BEST PRACTICES**

**Prepared for the Georgia Department of Transportation**



**By the Georgia Institute of Technology's  
Schools of Public Policy and Civil & Environmental Engineering**



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BEST PRACTICES**

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## **TABLE OF CONTENTS**

Abbreviations . . . . .	iii
Acknowledgments . . . . .	iv
Abstract . . . . .	vii
Project Overview . . . . .	viii
Executive Summary . . . . .	xi

### **PART ONE – CROSS-CASE SUMMARY**

Section 1. Introduction . . . . .	1
Section 2. Best Practices Case Methodology . . . . .	3
Section 3. Important Contextual Issues . . . . .	11
Section 4. General Findings . . . . .	26
Section 5. Case Study Summaries . . . . .	32
Section 6. Other Good Practices . . . . .	44
Section 7. Summary . . . . .	54

### **PART TWO – CASE STUDIES**

Case 1: FDOT’s Program and Resource Plan and Consultant Acquisition Planning . . . . .	59
Case 2: PennDOT’s Engineering and Construction Management System (ECMS) . . . . .	69
Case 3: FDOT’s Professional Services Information (PSI) System and Contract Invoice Transmittal System (CITS) . . . . .	80
Case 4: PennDOT’s Transportation University . . . . .	87
Case 5: FDOT’s Production Management and Performance Monitoring System . . . . .	114
Case 6: ODOT’s Consultant Evaluation System . . . . .	126
Case 7: FDOT’s and PennDOT’s Consultant Audit Activities . . . . .	139

**APPENDIX**

Appendix A: Contact Information for State DOT Participants . . . . . 143

Appendix B: Pre-Qualification Telephone Interview Form . . . . . 145

Appendix C: Best Practice Cases – Site Visit Interview Protocol . . . . . 149

**TABLES**

Table 1-1: Task Reports and Data Sources . . . . . ix

Table 2-1: Pre-Qualification Interview States . . . . . 6

Table 2-2: Key Transportation Statistics for Peer States . . . . . 7

Table 2-3: Selected Best Practice Topic Areas by State . . . . . 8

Table 6-1: Best Practice Case Studies by GDOT Interest Area . . . . . 32

Table A2-1: Significant Events in the ECMS Implementation . . . . . 75

Table A7-1: ODOT Consultant Evaluation Values . . . . . 129

## **ABBREVIATIONS**

AASHTO	American Association of State Highway and Transportation Officials
ACO	Administrative Contracting Officer
ASCE	American Society of Civil Engineers
CDC	Centers for Disease Control
CEI	Construction Engineering and Inspection
CFR	Code of Federal Regulations
CMC	Contract Management Consultant
CO	Contracting Officer
COTR	Contracting Officer's Technical Representative
DBE	Disadvantaged Business Enterprise
DOE	Department of Energy
DOH	Department of Highways
DOT	Department of Transportation
FAIR	Federal Activities Inventory Reform
FAR	Federal Acquisition Regulation
FARA	Federal Acquisition Reform Act
FASA	Federal Acquisition Streamlining Act
FDOT	Florida Department of Transportation
GAO	General Accounting Office
GDOT	Georgia Department of Transportation
ICE	Institution of Civil Engineers
ITE	Institute of Transportation Engineers
KTC	Kentucky Transportation Cabinet
ODOT	Ohio Department of Transportation
OMB	Office of Management and Budget
OPM	Office of Personnel Management
PennDOT	Pennsylvania Department of Transportation
PMO	Project Management Oversight
QA/QC	Quality Assurance, Quality Control
RFP	Request for Proposal
SOW	Scope of Work
TRB	Transportation Research Board

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**Disclaimer**

The opinions and conclusions expressed or implied in this report are those of the researchers. They are not necessarily those of the Office of Materials and Research or of the Georgia Department of Transportation. Any errors or omissions belong to the authors.

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## **ABSTRACT**

This report identifies and analyzes best practices in the management of consultant programs found among state Departments of Transportation (DOTs). Seven individual case studies are documented addressing the following topics: Strategic Planning and Management, Resource Allocation, Automation and Information Systems, Training and Project Management, Performance Measurement, Consultant Evaluation, Consultant Audits, and Overall Consultant Process.

The best practices are drawn from three state DOTs (Ohio, Pennsylvania, and Florida) who have adapted organizational structures and practices to maximize the effectiveness of the consultant management process by implementing agency-wide procedures. The cases were selected based on the following steps: systematic prescreening based on web research of all 50 states; 19 states were identified as having the greatest potential to be best practices of consultant management; after telephone interviews with key contact people in 15 of these states, the list was narrowed down to the 7 major best practices represented in this report.

This report is part of a series of studies commissioned by GDOT and is designed to present alternative approaches to consultant management.

## **PROJECT OVERVIEW**

The number of consultants employed by the Georgia Department of Transportation (GDOT) has grown dramatically. GDOT executives estimate that consultants now conduct 50% of the design engineering work and other professional services that GDOT performs – up from 10% less than 10 years ago. Large numbers of consultants are being used in 32 of GDOT’s offices, performing activities vital to the core missions of GDOT and representing \$450 million dollars in consultant contracts over the last 3 years. This has led many state DOT officials to ask fundamental questions about the nature of the managerial systems and organizational designs needed to operate in this new environment.

Public organizations throughout the United States have increased reliance upon the private sector to fulfill core mission activities; illustrating that state DOTs are not unique in their struggles to make effective use of an increasing number of consultants. This research is designed to explore the many factors that influence the effective use of large numbers of consultants by GDOT. This focus on effectiveness requires an assessment of the current managerial systems and procedures used by GDOT and other state DOTs in consultant management, as well as an analysis of the contribution (or hindrance) of existing managerial systems and procedures to the quality of both the consultant management process and project objectives.

Accordingly, there are several task reports produced by this research. Each report is concerned with accomplishing at least one of the elements of the research design. Table 1 provides a list of the task reports produced from the research and the sources of data from which they were developed. Each of these studies examines consultant

management from a distinct perspective. The Systems Review (Task 2) and the Survey of GDOT Managers (Task 5a) observe the perspectives of managers inside GDOT. The Literature Review (Task 1), Best Practices Case Studies (Task 3), and the Consultant Report (Task 5b) capture the perspectives of stakeholders and professionals external to GDOT. The Project Case Studies (Task 4) examines the perspectives of GDOT managers and external stakeholders as they interface in the consultant management process. The Interim Report (Task 6) triangulates across reports 1 through 5b in order to determine areas of convergence and divergence in the data and summarize the various recommendations from each of these reports.

**Table 1-1: Task Reports and Data Sources**

<b>Task Report</b>	<b>Data Source</b>
Task 1: Literature Review	Reviews of the professional and academic literatures on consultant management. Interviews with experts in managing state DOT systems.
Task 2: Systems Review	Interviews with senior GDOT managers at the office head level and above. N=24
Task 3: GDOT Project Case Studies	Interviews with GDOT managers and consultants associated with 12 GDOT sponsored projects. Also a review of the archival evidence associated with each project.
Task 4: Best Practice Case Studies	Telephone interviews with state DOT officials in 16 states. Face-to-face interviews with DOT officials in Florida, Ohio and Pennsylvania.
Task 5a: Survey of GDOT managers	Mail survey of GDOT managers engaged in working with consultants. Responses from 21 GDOT offices; N=286, Response Rate=77%
Task 5b: Consultant Report	Compilation of 7 GDOT and DOAS databases into a unified list of GDOT consultants. Face-to-face interviews with consultants. Responses from 22 firms; N=54.
Task 6: Interim Report	Summarizes findings of Tasks 1 through 5b and provides recommendations for enhancing effectiveness of GDOT consultant management practices.

This research was conducted by a team from the Georgia Institute of Technology's School of Public Policy and School of Civil and Environmental Engineering. The team was contracted by GDOT to study its consultant management practices and provide recommendations on the effective use of its consultants.

The contract began in the spring of 2002 and will be completed in the spring of 2004. In the midst of the contract period, GDOT hired a sub-consultant, The North Highland Company, a management and technology consulting firm, to design and update GDOT procedures for managing consultants. The work of North Highland builds upon the research conducted at Georgia Tech. Although information was shared between the Georgia Tech team and North Highland, the efforts of the two teams were separate, and independent products were developed. GDOT and Georgia Tech have signed a supplemental agreement expanding the scope of the work to include a new phase for a study on the human capital skills sets required to manage GDOT consultants, which will commence immediately and conclude in the spring of 2004.

## **EXECUTIVE SUMMARY**

The purpose of this project was to identify the Best Practices of State DOTs relative to the management of consultant programs. Seven individual Best Practices have been documented along with many other suggestions, which, taken together, provide the Georgia Department of Transportation (GDOT) with many ideas for its own program. While each of the Best Practices deserve consideration for implementation based on its own merit, they all represent an opportunity to synthesize the experiences and ideas of other State DOTs involved in consultant management. This synthesis is intended to be helpful to GDOT in examining the high-level organization of its processes and resources to manage consultant programs.

### **Study Methodology**

Using a systematic screening method, the project team examined information from the websites of all 50 states and identified the 19 states with the greatest potential for using best practices in consultant management. Key contact people for each State DOT were identified and telephone interviews were used to screen the short-listed states to determine which states would be good candidates for site visits where detailed consultant program information could be gathered and where best practices were being used. The project team focused on identifying potential best practices during the telephone interviews that focused on key GDOT interest areas, such as consultant evaluation, audits, training and project management, etc.

A total of 15 of the 19 states participated in the screening interviews. The results of the telephone interviews along with statistical information on each state were used to narrow the list of potential site visits. Site visits at Florida DOT, PennDOT, and Ohio

DOT were arranged. The project team developed a detailed interview protocol for use in the site visits (see Appendix) to gain an understanding of the agency's overall consultant management processes as well as specific best practices. All visits were documented in writing and tape-recorded.

### **Best Practice Cases**

The site visits to the three State DOTs provided a wealth of information about the overall organization of consultant programs and individual best practices. The following specific practices are fully documented in Appendix A. Summaries of the cases can be found in Section 6. Other good practices identified in the site visits have been summarized in Section 7.

The case studies include:

- Case 1 - FDOT's Program and Resource Plan – this case describes an agency-wide process to identify consultant needs across major program and sub-program levels over a five-year period. This process shows how FDOT sees its consultant program as a strategic organizational issue.
- Case 2 - PennDOT's Engineering and Construction Management System (ECMS) is the subject of the case showing how a major processing reengineering and technology investment can transform a state DOT's consultant and construction programs into a "paperless" system.
- Case 3 - The best practice case involving FDOT's Professional Services Information (PSI) and Contract Invoice Transmittal System (CITS) shows how the agency has introduced new technology systems to support consultant management in an incremental manner.

- Case 4 - The best practice case about PennDOT's Transportation University illustrates how the Department created an innovative corporate learning center to serve the training and career development needs of its employees, including strengthening the skills of its project managers. The University is housed within PennDOT's Center for Performance Excellence.
- Case 5 - FDOT's Production Management and Performance Monitoring System describes how the decentralized agency with many work units responsible for delivering its transportation program, including a large number of consultant projects, developed a comprehensive system of monitoring production (achieving annual work programs) and performance (accountability).
- Case 6 – This case describes an innovative on-line consultant evaluation system developed by the Ohio DOT which customizes the evaluation according to the nature of the transportation project (roadway design, bridge design, traffic control, etc.).
- Case 7 – Two DOTs (Florida and Ohio) are highlighted in this case for their practices to expedite pre-award and post audit activities.

### **Important Contextual Issues**

During the site visits to FDOT, PennDOT, and ODOT, five high-level, overarching themes were observed by the project team which appear to strongly impact how consultant management practices in each agency have been developed and implemented. These issues relate to the general environment or context in which the best practices were observed. *Among the most important of these was the strong influence that strategic planning and management processes play in effective consultant*

*program management. All three State DOTs have used strategic planning concepts in their consultant program management, which has enabled them to coordinate their business practices, human capital, and technology systems to their best advantage.*

- Strategic planning and management, whether done as part of an agency-wide model or done in response to an individual executive management style, has helped each State DOT better utilize its resources, including human capital and consultant resources, to achieve ambitious agency goals. All three DOTs are viewed as very progressive by their peers.
- Effective consultant program management practices are “transparent”, that is, they are easily understood and visible to DOT staff, consultants, agency partners, and the public.
- The best practices observed in Florida, Pennsylvania, and Ohio are based on processes, procedures, and time frames that are well defined and known to the participants, bringing more reliability to work flow.
- The three State DOTs have developed management processes which are understood and accepted by their many stakeholders. This helps the organizations shape their operating environment and enables them to withstand attempts to influence or circumvent its actions by political or other external forces.
- Each State DOT has implemented processes, procedures, and systems which help it operate in a more consistent manner. This means that the “rules of the game” are defined for all of the players and are reinforced by the processes used by the DOT. Deviations from or inconsistencies in the “rules” are identified and addressed.

## **General Best Practice Findings**

Using the results of the prequalification screening interviews, the three site visits, and subsequent discussions with State DOT staff members, the project team has identified some general findings relative to best practices in consultant management. These observations have been synthesized from the data and information gathered during the site visits at Florida DOT, Ohio DOT, and PennDOT as well as information gathered from other states during the project. A selection of the findings is provided below. Summaries of the individual cases can be found in Section 6. Fully documented versions of the case studies can be found in Part II.

- All three DOTs see the use of consultants as very necessary to their ability to successfully deliver the transportation programs to the public. All three State DOTs see their relationship with consultants as partners. However, DOT senior managers recognize the importance of their roles as owners and stewards of public (state-owned) infrastructure, a role which cannot be contracted to others. All three DOTs are able to make the distinction between their role as an “owner” and their role as a producer of transportation improvements using external resources.
- The use of automated processes in consultant management, either as an agency-wide process reengineering effort or as a small-scale incremental approach, are helping DOTs be more efficient and also meet quality goals. An FDOT representative stated that automated systems were enabling them to get a higher level of consistency and quality of certain work products they could not get any other way.

- All three states have used methods of separating the “technical” and “administrative” aspects of consultant project management.
- All site visits confirmed the importance of effective consultant evaluation systems to control program management and improve the overall quality of consultant products. All report using consultant evaluation data in the consultant selection process with very good results.
- Performance monitoring systems are being used at the agency-wide level (FDOT) to facilitate consultant program management and improve accountability and public confidence.

There is a long history of State DOTs sharing information with peers through various professional organizations, such as AASHTO, and informal relationships. During this project, representatives of each agency have offered to continue communications and coordination on consultant program activities with GDOT staff members. Hopefully, a continuing relationship can benefit all parties and assist each organization in its consultant management activities in the future.

### **Team Recommendations**

The Best Practices Case Study analysis has provided many good insights and ideas which should be helpful to GDOT as it considers ways to enhance its consultant management program. The following actions represent the project team’s recommendations.

- Frame the use of consultants as a strategic issue for organizational planning and management and create resource allocation, program development, and

performance monitoring systems across the organization that reinforce accountability for both GDOT and consultants.

- Invest in automation and information systems to support consultant program management and improve intra-agency communications. Priorities should include tracking systems for contract development, electronic routing of documents for signature, on-line databases of consultant firm information, and consultant evaluation systems.
- Consider the use of “Project Managers” and “Contract Managers” to separate the technical aspects of project management from the administrative aspects to make the program more efficient and effective.
- Modify the current practice of consultant evaluation to more fully describe the firm’s (and subconsultant’s) performance based on meeting the technical, schedule, budget, and management requirements of the project. Develop a system in which GDOT right-of-way and construction units can participate in the evaluation process for design projects.
- Organize a proactive training program, such as a Transportation University, for in-house staff and consultants to educate both groups on the GDOT project requirements and take advantage of technology and management advances. This measure can help keep GDOT job competencies at a high level and respond to changes in job requirements.

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## **Section 1: Introduction**

In 2003, the Georgia Department of Transportation (GDOT) entered into a contract with the Georgia Institute of Technology (Georgia Tech) to identify best practices within State Departments of Transportation (DOTs) related to the management of consultant programs. This effort was part of a larger project examining GDOT's current business processes relating to consultants, experiences of its own in-house involved in consultant program activities, and interviews with representatives of over 70 consulting firms doing business with GDOT. All of these efforts have been coordinated with the development of the Best Practices Case Studies.

In this document, the project team has documented the best practices of several State DOTs as they relate to consultant management. Also offered are general findings on consultant program management within and among these DOTs and descriptions of other good practices which may be helpful to GDOT. This document presents the information in the following sequence:

- The Best Practices Case Study Methodology
- The Relationship of DOT Strategic Business Models to Consultant Programs
- The Use of Project Managers and Contract Managers: The Ohio DOT Practice
- General Findings
- Case Study Summaries
- Other Good Practices
- Appendix (including the detailed Best Practice case studies and other supporting information)

The Best Practices Element of GDOT's Consultant Management Project illustrates the high degree of creativity and empowerment that can be generated within State DOTs to manage transportation programs, including consultant program activities.

While State DOTs have common missions and responsibilities in accordance with federal law, there are variations in state laws, agency organization, management policies, and strategic direction that factor into how DOTs carry out their responsibilities. These commonalities and differences provide an environment for innovation and opportunities for DOTs to learn from one another.

The Best Practices Case Studies have been developed in recognition that consultant management programs do not exist within an organizational vacuum. They are linked to and rely on the business processes, organizational procedures, administrative systems, technology, and human capital of the entire organization.

The Best Practice Case Studies focus mainly on how consultant management practices are carried out within the Pennsylvania Department of Transportation (PennDOT), the Ohio DOT, and the Florida DOT. Noteworthy practices of other DOTs are also cited, where appropriate. This document is intended to provide information how these DOTs have approached their overall missions, organized their consultant management programs, and how they have developed new practices or adapted previous ones to carry out their responsibilities.

## **Section 2: Best Practices Case Methodology**

The project team utilized a systematic approach to identify a set of best practices related to the management of consultant programs within State DOTs. The general process for identifying the best practice cases used the following process. A description of each step follows.

1. Review Critical GDOT Consultant Program Issues
2. Research Current Consultant Programs at State DOTs
3. Conduct Prequalification Screening of State DOTs
4. Summarize Initial Best Practice Areas
5. Conduct Site Visits and Document Best Practice Cases

### **Review Critical GDOT Consultant Program Issues**

A significant level of effort was made and a myriad of sources were used to document key issues regarding GDOT's current practices in managing its consultant program. The Task 1: Literature Review provided significant starting points from which the project team developed a model used to frame the critical issues. A comprehensive survey of GDOT's in-house staff involved in consultant management activities as well as personal interviews with over 70 consulting firms doing business with GDOT further provided substantial bases for identifying and detailing key issues. Even discussions with national experts provided information which was used in outlined the issue areas. At the time of the best practices case development, the results of GDOT's employee survey were not available; therefore, the issues identified by the consultant community were used to develop the best practice cases.

Additionally, GDOT feedback from other consultant program management activities was used to identify, from the Department's perspective, some of the challenges facing the agency in terms of managing larger levels of consultant programs. In general,

these program issues were grouped into seven major categories. The Best Practices cases and general findings related to these topics are documented in this report. These issues represent the highest priority issues from the view of key GDOT managers and are also quite important to the consultant community based on the data from their interviews. The targeted topics listed below are not in priority order.

- Strategic Planning and Management
- Resource Allocation for Consultant Programs
- Development of Technology and Information Systems to Support Consultant Management
- Training, Recruitment, and the Development of In-house Project Management Capabilities
- Performance Management Systems
- Consultant Evaluation
- Audit Activities
- Use of Project Managers and Contract Managers

In addition to the seven major issue areas, the project team compiled a list of over 25 other practices related to consultant management, which can be useful to GDOT in its future consultant program development activities.

### **Research Current DOT Consultant Programs and Conduct Prescreening Interviews**

Once the key best practice topic areas were identified, the project developed a framework by which the 50 State DOTs that had the greatest likelihood of using best practices with regard to the above stated issues were identified. This process involved a three-tiered research approach, where the first tier involved a basic web search, the second tier involved a comparison of census and infrastructure data between the states and Georgia, and the third tier utilized phone interviews with personnel from various

state DOTs. At both the first and the third tier the project team attempted to locate the states that had done the most within each of the categories as well as those that had done the most overall.

Using each state DOT's website, the team developed a "short list" of states which would participate in a prequalification telephone interview. The project team used information from the American Association of State Highway Transportation Officials (AASHTO) website to access the websites of each of the 50 State DOTs. A review of each DOT website was conducted to assess the likelihood of best practices in relation to consultant program management and the targeted topics. The following factors from each state DOT's website were considered in identifying whether the state would be included in the prequalification interviews.

- Indications of whether the State DOT viewed its consultant program as an important element in its overall mission and objectives. Such indicators were aggregate and specific strategic planning with regard to consultant management, unique programs for training, and clearly defined career advancement possibilities within consultant management;
- Use of technological tools related to consultant activities – evidence of a substantial investment in time and resources to develop web-based tools to conduct business with consulting firms;
- Aggregate level of consultant program innovation – evidence of significant levels of effort to develop an organized program, including program guidelines, information systems, defined work processes, resource allocation, acquisition, performance measurements, and evaluative criteria; and

- The amount and complexity of information pertaining to the agency’s consultant program and the type and quality of information provided for the consultant community.

Using these factors, along with further input from GDOT personnel, the project team identified 19 states that exhibited either substantial involvement or innovation with regard to consultant management. Table 2-1 identifies these states; participants are those that participated in pre-screening telephone calls and non-participants are those that did not participate in prescreening phone calls.

*Table 2-1: Pre-Qualification Interview States*

<b>Non-Participants</b>	<b>Participants</b>	
Colorado	Arizona	North Carolina
Minnesota	Delaware	Ohio
New York	Florida	Pennsylvania
Utah	Illinois	Tennessee
	Iowa	Texas
	Kentucky	Washington
	Louisiana	Wisconsin
	Maryland	

For each State’s consultant program which was included on the “short list”, the project then compiled relevant and readily available census and infrastructure information in order to compare each of the states to Georgia. Table 2-2 illustrates some of these key statistics. These statistics were compared to values for the State of Georgia and GDOT. The values closest to those for Georgia/GDOT are highlighted.

Table 2-2: Key Transportation Statistics for Peer States

State	Resident Pop. (in 000s)	Total Nat'l Highway System Lane Miles	Annual Vehicle Miles Traveled (in millions)	Highway Expend. After Transfers (in millions)
<b>Georgia</b>	<b>7,642</b>	<b>4,670</b>	<b>97,030</b>	<b>\$ 1,463</b>
Arizona	4,669	2,806	45,486	\$ 1,069
Delaware	739	325	8,204	\$ 275
Florida	14,916	4,330	137,496	\$ 3,122
Illinois	12,066	5,737	101,273	\$ 1,819
Iowa	2,862	3,231	28,912	\$ 737
Kentucky	5,294	2,914	46,577	\$ 1,206
Louisiana	4,332	2,719	40,326	\$ 903
Maryland	5,059	1,455	48,343	\$ 858
North Carolina	7,546	4,192	85,283	\$ 2,009
Ohio	11,207	4,543	104,924	\$ 1,814
Pennsylvania	12,052	5,475	99,908	\$ 2,558
Tennessee	5,431	3,384	62,562	\$ 1,926
Texas	19,934	13,704	206,023	\$ 3,668
Washington	5,687	3,384	51,927	\$ 1,012
Wisconsin	5,107	4,215	56,655	\$ 875

Source: U.S. Department of Transportation, "Our Nation's Highways", November 2000.

From the states identified from the web and demographic research, the project team identified the individuals in responsible positions within each DOT who could likely discuss consultant program management topics with the project team. This information was gathered from information on the agency's website. Each DOT was contacted by telephone and given the opportunity to participate in the survey. If the person was not the appropriate contact, then the project team asked for the correct individual to interview. In some cases, one individual could discuss all aspects of the entire consultant program. In some cases, the project team interviewed more than one person for each state. Due to difficulties in reaching the appropriate contact person,

vacation schedules, and other similar situations, the Prequalification Survey was conducted with 15 of the 19 states.

The script used for these telephone interviews is included in Appendix B. The purpose of the screening interviews was to identify the states with the potentially best practices related to consultant management. Each interview was fully documented.

**Summarize Initial Best Practice Areas**

Using the results of the survey, the project team organized the feedback from the screening interviews into each of the GDOT best practice topic areas. Within each area, individual practices were reviewed to determine which practices represented the “best of the best”. Using this framework, the team determined which states should be scheduled for a site visit to gather more detailed best practice information. The DOTs in Pennsylvania, Ohio, and Florida were selected for site visits. Information about other best practices by other DOTs was also documented. Table 2-3 shows the State DOTs within each best practice topic area.

*Table 2-3: Selected Best Practice Topic Areas by State*

<b>Topic Area</b>	<b>State DOT</b>
Strategic Planning and Management	Pennsylvania and Florida
Resource Allocation	Florida
Automation and Information Systems	Pennsylvania and Florida
Training and Project Management	Pennsylvania, Florida, and Kentucky
Performance Measurement	Florida and Arizona
Consultant Evaluation	Ohio and Florida
Consultant Audits	Florida and Ohio
Overall Consultant Process	Florida, Ohio, and Pennsylvania

A detailed interview protocol was developed for the site visits incorporating questions about the overall consultant process, the agency's consultant audit activities, and the best practice topic areas. This protocol was tested via a conference call with the staff of the Kentucky Transportation Cabinet prior to conducting the DOT site visits.

### **Conduct Site Visits and Document Best Practice Cases**

Three site visits were conducted at the headquarters offices of the Florida DOT (Tallahassee, FL); Ohio DOT (Columbus, OH); and PennDOT (Harrisburg, PA) during mid-to-late May, 2003.

Using the detailed interview protocol, the site visits were structured to include:

- A general, introductory session for key DOT staff members and the project team to explain the purpose of the project and the sequence of events for the site visit.
- A session to discuss the overall consultant services acquisition process (steps in the process, time frame, responsible work units, etc.)
- A session to discuss the various types of audit activities associated with the consultant program.
- Various sessions relating to the best practice topic areas, including representatives from several other DOT work units, including Information Technology, Training, Program Management, and District Offices.

The general session included DOT representatives plus four individuals from the project team. Following the general session, two sets of breakout sessions were held to gather data and information about individual best practice topic areas. One person asked the interview questions while the other person documented the session with tape

recordings and written notes. These records were later compiled and organized for use in drafting the best practices case studies. The draft cases were also provided to the participating State DOTs for review and comment.

### **Section 3: Important Contextual Issues**

Some important issues emerged in the site visits and discussions with DOT staff relative to the best practices. These issues have to do with the general organizational environment or context in which each of the three DOTs have developed and implemented their consultant management processes. These contextual issues include:

- The use of strategic business models or strategic planning systems that guide the agency's organizational processes, human capital, technology systems, and interactions with customers.

Both PennDOT and FDOT have adopted specific business models to strategically guide the organization. ODOT has not adopted a specific model, but also uses a strategic approach to organizational planning. All three agencies have instituted proactive organizational learning (training) programs and on-line resources to assure their employees and consultants have high levels of job competency. This focus on agency-wide learning and career development is a critical part of the agency's strategic framework.

- All three agencies have focused on their human capital needs in a variety of ways and have defined organizational roles to capitalize on core competencies and improve efficiency.

Technical skills, including the management of technical tasks, are the core competency for project managers in all three DOTs. Core competencies in contract development, administrative processes, auditing, and finance are all placed outside the technical work units and in work units focusing on these activities. All three states have separated the "technical" aspects of consultant

management from the administrative aspects of it, although in different manners.

All three report benefits from this separation of duties in terms of efficiency and quality.

These contextual issues are important to understand as specific best practices are more fully described in this report.

### **Strategic Planning and Management**

This issue relates to the use of agency-wide strategic business models and their relationship to the management of consultant program activities. Both PennDOT and Florida DOT have adopted these models, two states where consultant program activities are have evolved and are very sophisticated. Although ODOT has not formally adopted a business model, many of the agency initiatives discussed by ODOT representatives with the project team are typical of strategic business models (employee empowerment and participation, customer orientation, etc.).

*It is not a coincidence that these two states which have adopted strategic planning initiatives are also making large strides in successfully managing larger and larger transportation programs and successfully integrating consultant program activities to achieve their agency goals.* Both PennDOT and Florida DOT have organized their in-house staff and consultant program activities to mutually support the delivery of transportation programs to the public using a variety of tools and best practices. Several of their best practices are documented in this report.

The project team has documented the strategic business model framework for PennDOT and FDOT as well as the relationship between these models and the agency's consultant program activities. Each state's DOT organization, level of transportation

program, and general approach to its consultant program are described below along with the relationship of these activities to its adopted strategic business models. PennDOT's model is described first, then FDOT's system.

### ***PennDOT's Environment***

PennDOT is a decentralized organization with its headquarters office based in Harrisburg, PA and 11 district offices operating around the State. The agency currently has about 12,000 employees. During the mid-late 1990s through 2001, the agency's construction contract letting levels were about \$700 million annually. In 2002, the agency had a construction program letting level of about \$1.6 billion. Similarly, PennDOT's consultant program has grown. During the 1996-1998 time frame, total consultant program levels were in the range of \$120 – 130 million per year. Starting in 1999, the consultant level grew to \$200 million. In 2003, about \$300 million will be committed in consultant contracts. According to PennDOT's Chief of the Design Services Division, "...consultants are very, very necessary to delivering our transportation program for the citizens of Pennsylvania...".<sup>1</sup>

The agency has utilized consultant resources for many years, but within the last five years, the consultant program level has more than doubled. The two reasons for this are increased levels of federal transportation funding from the Transportation Efficiency Act for the 21<sup>st</sup> Century (TEA 21) and the agency's inability to increase the number of its own employees. In the mid 1970s, PennDOT had over 23,000 employees. PennDOT's current workforce just over one-half that number today, with a program level several times larger than 30 years ago.

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<sup>1</sup> Interview with James Ritzman, P.E. (PennDOT Bureau of Design) on May 21, 2003.

### ***PennDOT's Strategic Business Model***

In late 1997, PennDOT adopted the Malcolm Baldrige Performance Excellence Criteria to foster success in its overall organizational effectiveness. The U.S. Department of Commerce is responsible for the Baldrige National Quality Program and its associated award program. The Baldrige criteria were developed to strengthen U.S. competitiveness by improving organizational performance, facilitating communications and best practices information, and serving as a tool for guiding organizational planning. Private and public sector organizations compete for Baldrige awards each year. More information about this program can be found in the publication entitled "Criteria for Performance Excellence" published by the Baldrige National Quality Award Program (BNQAP).

According to the BNQAP, the Baldrige quality criteria "...are built upon the following set of interrelated Core Values and Concepts....:

- Visionary leadership
- Customer-driven excellence
- Organizational and personal learning
- Valuing employees and partners
- Agility
- Focus on the future
- Managing for innovation
- Management by fact
- Social responsibility
- Focus on results and creating value
- Systems perspective..."<sup>2</sup>

These values and concepts have guided the overall process reengineering effort at PennDOT. These values and concepts are evident in the agency's approaches to its business processes, including its consultant program management activities.

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<sup>2</sup> Baldrige National Quality Program – "Criteria for Performance Excellence", U.S. Department of Commerce, 2003.

Some examples of the use of these concepts and values in the PennDOT organization include:

- The establishment of the Center for Performance Excellence (CPE) to support agency performance monitoring and quality improvement.
- The creation of the Transportation University (TU) to focus on employee and organizational learning.
- The creation of the Engineering and Construction Management System (ECMS) to create stronger customer networks and more effective communications via its on-line link to over 7,500 registered business partners (PennDOT employees, consultants, contractors, vendors, etc.).
- The creation of the Department's Agility Program to trade services with local governments in support of PennDOT's maintenance and highway operations responsibilities.

The Center for Performance Excellence provides a range of services in support of the Malcolm Baldrige effort. Key aspects of the CPE's operation include training and technical assistance to PennDOT managers on Baldrige concepts and performance criteria. The Center also provides assistance to PennDOT managers with process improvement efforts. The CPE also furnishes Relationship Managers who work one-on-one with the districts, counties and bureaus providing customized and personal support for PennDOT's quality programs. The Center is also responsible for obtaining Continuing Education Unit (CEU) credit for PennDOT-sponsored training.

The TU also supports PennDOT's overall Strategic Planning and Performance Measure activities. These efforts have produced "Moving Pennsylvania Forward", a

strategic agenda document that has produced amore rigorous approach to program delivery involving customers, stakeholders, partners, suppliers, and employees. The CPE is also involved in conducting an Organizational Climate Survey (in association with Penn State University); an Organizational Benchmarking Methodology; and a Customer Segmentation Program (in association with PennDOT’s driver licensing operations).

***The Relationship to PennDOT’s Consultant Program***

In 1998, as part of PennDOT’s agencywide process reengineering and quality improvement efforts, the organization developed a “paperless” process for managing its engineering and construction programs, called the “Engineering and Construction Management System” or ECMS. According to PennDOT’s Acting Chief Engineer and ECMS Project Manager, “...PennDOT is a very district-centric and project manager-centric organization...”.<sup>3</sup> The ECMS system was developed with this perspective in mind.

As part of the ECMS system, PennDOT registers its “business partners”, including consultants, contractors, local governments, and vendors, and provides on-line access to the agency’s automated systems, technical guidance documents, and training information. Almost 6,000 PennDOT employees have access to the system. About 510 consultant firms and 1,033 construction contractors are registered business partners. Nearly 400 registered business partners are associated with the PennDOT’s design program. The agency provides training programs for PennDOT staff, consultants, construction contractors, and local government partners, many of which involve the ECMS system. The ECMS is also a repository for engineering and construction related

technical documents and guidance for use by consultants, contractors, and others. Recently, PennDOT won the Pathfinder Award from the American Association of State Highway Transportation Officials (AASHTO) for the ECMS system development.

### ***Florida DOT's Environment***

The Florida Department of Transportation (FDOT) is responsible for the planning, design, construction, operations, and management of the State Highway System. FDOT also provides technical assistance and funding to bus, rail, port, airport, and intermodal projects and systems across the state. FDOT also owns, operates, and maintains a 70-mile commuter rail corridor in SE Florida. As of 2003, the agency is responsible for about 39,703 lane miles of roadways and 6,253 bridges and works in cooperation with transit systems, airports, ports, and railroads to create a multimodal statewide transportation system. The agency's mission is to provide a safe transportation system that ensures the mobility of people and goods, enhances economic prosperity, and preserves the quality of Florida's environment and communities.

The Florida DOT is a decentralized organization with a large amount of decision-making and operational responsibility delegated to its District Offices. Its headquarters office based in Tallahassee and is responsible for developing the State's transportation policy and procedures, training, technical assistance and quality assurance program. FDOT's eight district offices, located around the state, are responsible for planning, producing, building, and maintaining the transportation system. The agency currently has approximately 8,700 employees.

To assist in delivering its annual Work Program, it utilizes consultant services in many of its functional units throughout the State, including planning, design,

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<sup>3</sup> Interview with James Ritzman, P.E. (PennDOT Bureau of Design) on May 21, 2003.

environmental analysis, right-of-way acquisition and property management, construction engineering inspection, traffic operations, and public transportation. In 2002/03, FDOT managed a program including \$2 billion in construction project lettings. FDOT estimates that about 200 individuals serve as Project Managers for planning, design, right-of-way, construction, and maintenance projects. This figure does not include the Professional Services/Procurement staff who handle the administrative functions associated with the consultant program. About 20% of its total workforce is based in the headquarters office with the remaining 80% distributed throughout the State in seven district offices and the Florida Turnpike Enterprise office in Orlando.

The Florida Transportation Commission operates in an oversight capacity to FDOT with its members appointed by the Governor. While the Commission is not authorized to direct the activities of FDOT, they do provide policy guidance and conduct regular performance reviews and report to the Florida Legislature and Governor's Office.

As of 2001/2002, according to FDOT, it has privatized about 66% of its planning effort, 78% of its design work, 100% of its construction activities, 78% of construction inspection, 72% of its maintenance activities, and 85% of its toll collection. About 588 prequalified consultants are registered to do work with FDOT. About 450 firms are prequalified contractors in Florida. About 10,500 firms are vendors who provide other goods or services to the agency.

### ***FDOT's Strategic Business Model***

According to FDOT's website, in 1998, the agency submitted an application for the Sterling Quality Challenge. A Sterling Examination Team visited FDOT, conducted a site visit, and made three major recommendations:

- FDOT should consider adopting the Sterling Criteria for performance excellence as a business model;
- FDOT should develop a set of measures that reflect the outcome and results needed to satisfy its numerous stakeholders; and
- FDOT should consider increasing the level of employee development and employment involvement.

The organization began training its senior managers on the Sterling Quality principles and in September, 1998, the organization formally adopted the Sterling Criteria as the Department's Business Model. The model focuses FDOT in major strategic directions such as customer service and relationships, employee satisfaction, workforce development, and productivity.<sup>4</sup>

As part of the Sterling Quality model, FDOT developed its vision, mission, and values and identified its key customer groups, suppliers, and dealers. FDOT also examined its competitive position, competitive success factors, strategic challenges, and performance (process) improvement system.

### ***The Relationship to FDOT's Consultant Program***

In terms of the linkage between FDOT's Sterling Business Model and its consultant program, the agency has identified a strategic objective within the agency's focus of delivering the Work Program. It is clear from examining FDOT's business processes in detail, the agency has embraced the management of consultant resources to enable the delivery of almost all facets of its Work Program. Recognizing the need for external resources to supplement FDOT's internal staff resources, the agency has identified two explicit performance measures that relate to aspects of consultant

management. These measures are the percentage of total contracts and the cost of supplemental agreements (for both consultants and construction contractors) and the percent time changes in project schedules (including consultant projects). A third measure relates to overall customer satisfaction with FDOT (from customer survey data).

These three measures are continuously monitored by FDOT to ensure meeting its strategic objective of delivering its Work Program to Florida's citizens. These measures are using to monitor all projects, including consultant projects, on a monthly basis through the FDOT's agency-wide Production Management and Performance Review process (see Best Practice Case Study).

### ***Conclusions***

The use of strategic business models within State DOTs is an expansive subject and its complete examination is beyond the focus of the Best Practices Case Studies. However, the value of these systems in improving organizational effectiveness, including consultant program management, has been observed in all of the site visit states and should be considered and examined in more detail for application within GDOT.

The future is likely to bring GDOT continuing challenges in terms of employee turnover, difficulty in recruiting engineering professionals, and expanded public expectations for transportation facilities and services in a growing state. These factors could provide the appropriate environment for GDOT to consider new ways of meeting its organizational demands in the future and increased focus on strategic planning. Possible solutions could include, but not be limited to, adopting strategic business models, streamlining business processes, making greater investments in technology,

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<sup>4</sup> FDOT Website – Sterling Business Model

implementing programs to strengthen workforce capabilities, improving customer service, and expanding its capabilities to use external resources and partnerships.

**Role Definition: Project Managers and Contract Managers**

One of the most critical parts of the consultant management process for state Departments of Transportation is how to define the roles of DOT staff that interact with consultants. One of the important aspects of program management is defining whether the consultant and the DOT have both lived up to the terms of the consultant agreement. Georgia DOT currently uses a concept of management where a single Project Manager is responsible for both the technical guidance and contract administration associated with a consultant project. In contrast, the Ohio DOT has separated out these responsibilities and assigned them to different individuals: a Project Manager and a Contract Manager. Other DOTs, such as FDOT and PennDOT, have also separated these functions, but do not use the term “Contract Manager” for the administrative role and have slightly different organizational processes to handle these responsibilities.

The Ohio Department of Transportation (ODOT) is the state agency responsible for constructing and maintaining state owned transportation infrastructure in the State of Ohio. Based in Columbus, Ohio, ODOT is a 6,300 member organization responsible for around a \$1.15 billion work program annually. Divided into twelve districts, ODOT is a decentralized organization and is responsible for infrastructure in larger urban areas, rural farming communities, small and medium size cities, and Appalachian communities.

For consultant projects, ODOT uses two managers – a Contract Manager (CM) and a Project Manager (PM). The CM is responsible for making sure that all aspects of the contract, including scoping, selection, and negotiations, comply with agency policies

and procedures and that the consultant delivers the products and services the contract specifies. The CMs do not have to have an engineering or technical background. The PM is responsible for all the technical aspects of the contract, including such tasks as the review of engineering or other technical plans and the day-to-day management and decision-making for the project. This discussion focuses on the roles and responsibilities of the Contract Manager.

Simply put, the Contract Manager is responsible for the administration of the contract defining the relationship between ODOT and the consultant. ODOT views this role as similar to a managing partner in the consulting firm and is responsible for all the non-technical and administrative process of the contract. According to ODOT's "Consultant Contract Administration" Manual, the Contract Manager is responsible for:

1. All activities leading up to the authorization of a contract, including the entire consultant selection process
2. Processing invoices for payment following review and approval by the Project Manager
3. Initiating contract modification procedures
4. Issuing breach of contract notices
5. Issuing stop work orders
6. Extending contract completion dates and adjusting schedules
7. Attending consultant evaluation meeting with the Project Manager

Under ODOT procedures, the Contract Manager is instructed to maintain:

1. All correspondence to or from the consultant
2. Records of all substantial conversations with the consultant
3. Meeting minutes
4. Marked Plan Sets
5. Paper print-outs of all e-mail messages
6. Copies of invoices and Letters of Transmittal
7. All other relevant documents

On most contracts, the Contract Managers duties are fairly administrative in nature, such as processing invoices and maintaining records. However, the Contract Manager is particularly important in two additional areas: the consultant evaluation process and in breach of contract and negligence proceedings.

In the ODOT system, the Contract Manager is jointly involved in the consultant evaluation process detailed in the Best Practice Case Study on Consultant Evaluation. Part of the Contract Manager's role is to evaluate the administrative side of the consultant's interaction with ODOT in addition to the Project Manager's assessment of the firm's technical abilities. This arrangement serves the useful purpose of allowing ODOT multiple views of consultant performance.

Since responsibility for issuing Stop Work Orders and Breach of Contract Notices lies with the Contract Manager, the role is critical on projects facing problems. ODOT procedures allow a Breach of Contract Notice to be issued in consultation with the Project Manager (who is responsible for all technical matters and day-to-day interaction with the consultant). The Project Manager is responsible for documenting the breach or default of contract and that documentation, in the form of a memorandum, is forwarded to the Office of Contracts to review. After consultation with the District Consultant Committee and the Administrator of the Office of Contracts, the Contract Manager takes appropriate action. The process is similar with situations involving negligence, except that a determination of negligence occurs after completion and closing of the project. The Project Manager again determines that negligence has occurred, documents the negligence, and forwards the documentation to the Office of Contracts for action.

ODOT allows the Districts flexibility in how the Contract Managers are assigned. Some districts may prefer to permanently pair a Project Manager and Contract Manager so that the two share responsibility for the same projects. In other districts, there may be only one or two contract managers who work with many project managers.

In discussions with ODOT Consultant Services staff members, no problems with the Contract Manager concept were identified. However, for an institution with no history of Contract Manager several obstacles could present themselves. These include:

- Defining the responsibilities of the Contract Manager and Project Manager.

Roles for both jobs must clearly be defined to avoid confusion over which party is responsible for which activities.

- Ensuring the close communication and coordination between the Contract Manager and the Project Manager.

Since these two people are jointly responsible for managing the consultant, ensuring that the two people present a consistent and complete message to the consultant is important to maintain effective contract management.

ODOT reports that the main benefit of the position of Contract Manager is that the Project Manager is released from labor-intensive, yet critically important administrative duties inherent in any contract. As the Project Manager, he/she can concentrate on providing the technical expertise and guidance the DOT requires to ensure a quality project. Additionally, having a qualified and effective Contract Manager also helps prevent mission creep in the project by making sure the contract is adhered to and that the products requested by the DOT in the contract from the consultant are satisfactorily delivered as specified in the contract. The Project Manager also has the Contract

Manager as a resource for assistance in dealing with problems arising during the project, including the need for contract modifications. Finally, having the Contract Manager join the Project Manager in the consultant evaluation helps ODOT ensure that the consultant evaluation is more complete and comprehensive. Other DOTs, such as FDOT and PennDOT report similar benefits.

## **Section 4: General Best Practice Findings**

Using the results of the prequalification screening interviews, the three site visits, and subsequent discussions with State DOT staff members, the project team has identified some general findings relative to best practices in consultant management. These observations have been synthesized from the data and information gathered during the site visits at Florida DOT, Ohio DOT, and PennDOT as well as information gathered from other states during the project. Summaries of the individual cases can be found in Section 6. Fully documented versions of the case studies can be found in the Appendix.

- All three DOTs see the use of consultants as very necessary to their ability to successfully deliver the transportation programs to the public. Each agency has “built in” the use of consultants as a valuable component of its processes and programs and strategy in meeting future program needs.
- Two of the three states (Florida and Pennsylvania) which are making the most progress in developing and managing their consultant programs have adopted strategic business models that guide the overall organization and business processes. The adoption of these models occurred following a critical loss of public confidence in the agency in both states. The third State DOT (Ohio) uses a strategic approach to its organization, although it is not tied to a specific model.
- State DOTs are creating direct linkages from their consultant program activities to their agency’s overall quality initiatives. This linkage is made in various ways depending on the agency. GDOT is doing this as well.
- The use of automated processes, especially in conjunction with the introduction of new or improved information systems has enabled State DOTs to improve the

- quality (consistency with established procedures) and quantity of work products produced (contracts, consultant evaluations, etc.). An FDOT representative stated that automated systems were enabling them to get a higher level of consistency and quality of certain work products they could not get any other way.
- PennDOT has successfully implemented a comprehensive, integrated approach to automation and information systems. Florida has used a more conservative, incremental approach to automation and information systems. Both states are seeing benefits from shifting to more automated processes (time savings, reduced staffing levels, etc.). The consultant communities in both states are embracing these technology changes.
  - All three states have used methods of separating the “technical” and “administrative” aspects of consultant project management. The Ohio DOT splits these responsibilities in its defined roles for Project Managers and Contract Managers. Its training materials also cover this division of responsibilities. FDOT does not use the term “Contract Manager”, but defines the administrative aspects of consultant management (contract preparation, database management, supplemental agreement preparation, etc.) as the responsibility of its Professional Services Offices (Central Office and District Offices). PennDOT uses a similar approach to FDOT’s and also employs a “Portfolio Manager” in each district to make decisions on the proper mix of in-house and consultant resources.
  - All site visits confirmed the importance of effective consultant evaluation systems to control program management and improve the overall quality of products. Generally, initial attempts with consultant evaluation systems did not get full

support from in-house DOT staff. Higher usage of consultant evaluation systems occurred when the systems were automated and made user-friendly and when management directives were issued mandating their use.

- All site visits confirmed that prior consultant performance (via the use of consultant evaluations) is considered very important in the consultant selection process. All three DOTs reported getting better consultant performance as a direct result of using consultant evaluations as part of the consultant selection process.
- While there are varying approaches and forms utilized by the three DOTs to evaluate consultant performance, all three are based on the value of minimizing the involvement of the DOT project manager in the project. This system assumes that consultants are aware of and have competency in DOT practices. All three DOTs have made a significant amount of resources available to the consultants to educate them on DOT project requirements, including on-line systems and training programs. Conducting training programs which include consultants is viewed by all three DOTs as valuable and necessary to quality products and services.
- The recruitment and retention of qualified engineering professionals, increasing privatization, and the downsizing of the public sector are all human capital concerns shared by the DOTs. All three have taken various actions to deal with these factors, including developing training and support programs for project managers, innovative recruitment programs, and even implementing a

Transportation University. These actions are documented in the Best Practice Case on Training and Project Management.

- Performance monitoring systems are being used at the agency-wide level (FDOT) and the work unit level (Arizona DOT) to facilitate consultant program management. FDOT views its agency-wide program monitoring system as critical to maintaining the public confidence in the organization and in preserving its excellent relationship with elected officials. Arizona DOT sees its use of consultant program performance measures as a tool to manage workload and district office work schedules.
- Each DOT visited by the project team has increased the decentralization of consultant program activities to its districts over time, although the district responsibilities and management processes vary from state to state.
- All three DOTs have experienced pressure in recent years to expand the pool of consultant firms involved in DOT projects. This pressure has been exerted mostly from State Legislatures concerned about the relatively small number of firms used by the DOT. In the case of ODOT, one of the consultant selection criteria currently being used in some districts is “not having done work for ODOT before”.<sup>5</sup> All of the DOTs expressed satisfaction with the progress they have made in opening up their consultant activities to more firms.
- All three State DOTs see their relationship with consultants as partners. They conduct activities that are focused on strengthening and building these relationships. However, DOT senior managers are also very aware of their responsibilities as owners and stewards of public (state-owned) infrastructure.

They see a clear role for consultants in helping them manage their organizational responsibilities, but recognize that their role as an infrastructure owner cannot be contracted to others. They are able to make the distinction between their role as an “owner” and their role as a producer of transportation improvements using external resources.

- All three DOTs acknowledge that there are many ways to accomplish a task; therefore, consultants should be trained to do things “the DOT way”. All three agencies have developed training programs for in-house staff, consultants, and others and actively encourage their participation.
- All three DOTs are experiencing challenges due to senior staff members retiring and being replaced with young professionals with much less experience. Two of the three agencies have already instituted programs to deal with this situation (Florida and Pennsylvania). The third agency (Ohio) is in the process of developing a comprehensive program to address this need.
- One agency (ODOT) has developed explicit guidelines and contract language to make the termination of consultant contracts easier for both the Department and the consultants. These situations include (1) breach of contract by consultants and (2) reasons that are beyond the control of the firm. These tools are considered necessary by DOT management to terminate unsatisfactory contractual relationships due to DOT’s actions or a consultant’s inability to meet contract requirements, sometimes through no fault of their own. ODOT project managers are trained in the proper use of these tools. ODOT senior managers report that these tools have been used from time to time and are effective.

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<sup>5</sup> Interview with Lyle Flower (Ohio DOT – Consulting Services Office) on May 23, 2003.

- All three DOTs work directly with an association of consultant firms at the state level in joint committees to discuss issues and/or solve problems that relate to consultant contracting.
- All three agencies provide opportunities for consultants to obtain leads on upcoming consultant opportunities. FDOT provides this information approximately one year in advance of official project advertisements. Ohio and Pennsylvania provide the information several weeks in advance of the official consultant services advertisement.
- All three agencies provide opportunities for consultants to market directly to DOT staff. These opportunities range from the presentation of general firm qualifications at district and headquarters office events (“dog and pony shows”) to statewide events where DOT, consultant, and construction contractor groups participate to individual meetings with DOT project managers or others to discuss the project requirements.

## Section 5: Case Study Summaries

The project team has documented a number of best practices that fall within the topic groups in which GDOT has an interest. These topic groups relate to the organizational challenges and special needs that GDOT has with regard to the management of its consultant program. The groupings were identified from team discussions, conversations with key GDOT managers, and the results of consultant interviews. Table 6-1 identifies the GDOT topic areas and the case studies related to each one.

*Table 6-1: Best Practice Case Studies by GDOT Interest Area*

<b>GDOT Interest Area</b>	<b>No. of Cases</b>	<b>Case Title(s)</b>
Program and Resource Planning	1	FDOT Program and Resource Planning (including Consultant Acquisition Planning)
Automation and Information Systems	2	PennDOT's Engineering and Construction Management (ECMS) System and FDOT's Professional Services (PSI) and Contract Invoice Transmittal System (CITS)
Consultant Invoicing	1	FDOT's Professional Services (PSI) and Contract Invoice Transmittal System (CITS)
Training and Project Management	1	PennDOT's Transportation University
Performance Monitoring	1	FDOT's Production Management and Performance Monitoring System
Consultant Evaluation	1	ODOT's Consultant Evaluation System
Consultant Audits	1	FDOT's and PennDOT's Pre-Award and Post Audit Practices

The following summaries provide an overview of the case studies that were completed that address each of these topics. Full documentation of each case can be found in Part II of this report. Each case study identifies and describes the practices, tools, and methods used by each DOT to implement the practice. Information about the nature of the DOT organization and an explanation of the general context for the practice

are also provided. The benefits, challenges, and lessons learned from the experience of each DOT are described as well.

**Case 1: Resource Allocation**  
**Name: The Program and Resource Plan Process and Consultant Acquisition Planning**  
**Owner: Florida Department of Transportation**  
**Contact Person: John Cross, P.E. – FDOT Production Management Office**

The allocation of available resources for all of the programs and activities undertaken by a State DOT is a critical element of its operation. This case examines how the Florida DOT uses an agency-wide process to identify funding needs across a five-year period for each of the major agency program areas (Planning, Design, Right-of-Way, Maintenance, Construction, Public Transportation, Toll Operations, etc.) and their sub-programs. This process includes identifying resources for FDOT’s “product” (the cost of acquiring right-of-way, constructing roadways, and building facilities, etc.); “product support” (in-house and consultant resources); and other support services (facilities management, toll collection, and other services).

FDOT’s Program Development Office manages the Program and Resource Planning process and actively involves the agency’s executive managers, including the FDOT Secretary, two Assistant Secretaries, and eight (8) District Secretaries, including the Director of Florida’s Turnpike Enterprise. This process leads to a high-level plan for allocating all available resources to the various FDOT functional (program) areas, which in turn, is the basis for the development of FDOT’s Five-Year Work Program. The Work Program is a detailed listing of all highway and public transportation projects planned to be implemented during that time frame and funded with federal and state funds through

FDOT. Under state law, the first three years of FDOT's Work Program cannot be changed without going through a complex notification process involving State Legislators and local government officials. This approach minimizes program changes and reduces the potential for wasting time and resources in project development.

FDOT's Executive Management Team, its Program Management Office, and the Florida Transportation Commission (FTC) continuously monitor the delivery of FDOT's Work Program using the agency's Production Management and Performance Reports (see Best Practice Cases Study on Performance Monitoring and Work Program Development). These two individual practices are linked and integrated within FDOT, allowing a seamless process for the agency to allocate its resources, identify projects and programs to consume them (including consultant programs), and monitor the delivery of these programs and projects according to specified schedules and budgets.

These processes are transparent to agency managers, elected officials and the public. FDOT staff members attribute the agency's high level of credibility with the public and elected officials to the use of these practices. The agency has been proud to report its achievement in delivering its Work Program at about a 95% to 98% level of commitment (actual contracts vs. planned contracts) for the past several years.

**Case 2: Automation and Information Systems**  
**Name: Engineering and Construction Management System**  
**Owner: Pennsylvania Department of Transportation (PennDOT)**  
**Contact: Douglas Tobin – Bureau of Design**

The Pennsylvania Department of Transportation (PennDOT) has been recognized by the American Association of State Highway Transportation Officials (AASHTO) and others for its innovative use of technology in supporting transportation programs,

including consultant activities. In 1997, PennDOT began developing its Engineering and Construction Management System (ECMS), a “paperless” system used to manage its consultant and construction contracting programs. The system also helps manage PennDOT’s administrative and human resource activities. This case study examines how an agency-wide strategic planning initiative and process reengineering effort resulted in a comprehensive program management system that is used extensively by in-house and external individuals. The ECMS program is used by over 7,500 registered business partners, including PennDOT employees, consultants, construction contractors, local governments, and vendors.

ECMS is a web-enabled data management tool that tracks projects from conception to contract closeout. ECMS offers the consultants the ability to monitor planned projects, advertisements and selection results, while also providing them an interface for project agreements, supplements, and work orders. It also has the added capability for electronic contract signing by both PennDOT personnel and consultant, drastically decreasing the turnaround time required to execute a consultant contract. ECMS integrates reference information, standards, and detailed technical guidance needed for projects into the main page of its website for ease of consultant use. Lastly, it provides the PennDOT Project Manager and Consultant Contract Office personnel with reporting mechanisms that track the status of the project (project milestones, key dates, and cost). ECMS operates on the network backbone of Pennsylvania’s Commonwealth Technology Center with PennDOT responsible for program development and maintenance. It was envisioned to meet four major needs of PennDOT:

- Reduce the Costs of Design Work
- Manage an Increasing Project Portfolio



More recently, FDOT developed its Contract Invoice Transmittal System (CITS) for all of its invoice payment activities, including those for consultants and construction contractors. Up until 2000, all consultant and construction invoicing was handled with manual processes. The large number of paper invoices for thousands of active projects which required the manual review and approval of multiple copies by project managers and others throughout the organization placed a huge resource burden on the agency. CITS was activated in 2000 to reduce dependency on manually processed and audited paper documents, including Professional Services (Consultant) contracts, invoices, and supporting information. The system is also capable of handling invoices from construction contractors.

Due to the introduction of these systems, dramatic improvements in the quality of work products (approved invoices) and time savings in processing times are being seen by FDOT. Prior to the introduction of CITS, the amount of time needed to reimburse a consultant was about 45 days from the time a proper invoice was submitted to FDOT. Under the CITS system, the processing time is now approximately seven (7) to ten (10) days.

**Case 4: Training and Project Management**  
**Name: The Transportation University**  
**Owner: Pennsylvania Department of Transportation**  
**Contact Persons: Shand Stringham – Center for Performance Excellence and Steven Davis – Bureau of Design**

This case will examine an extraordinary effort by PennDOT to address agency-wide training needs and grow the capabilities of its in-house engineering and non-engineering project managers. This initiative is the establishment of a corporate learning center, known as the PennDOT Transportation University (TU).

In the mid to late 1990s, the Pennsylvania DOT (PennDOT) entered a period focused on strategic planning and management, development of a more customer-oriented environment, and the streamlining of business processes. According to PennDOT staff members, the beginning of a more strategic perspective in PennDOT operations began as a result of a lengthy period in the 1970s and 1980s when the agency's reputation and public image were not good. The agency's leadership during the 1990s began changing this situation.

In late 1997, PennDOT adopted the Malcolm Baldrige Performance Excellence Criteria. This action resulted in virtually every unit within the Department undergoing some form of assessment and identification of opportunities for process improvement. Part of this effort included the establishment of PennDOT's Center for Performance Excellence (CPE) and within it, its Transportation University (TU). Other significant organizational changes were implemented as well, including the development of PennDOT's Engineering and Construction Management System (ECMS), which is highlighted in another Best Practice Case Study.

PennDOT's training unit, formerly housed within its Human Resources Department, was transferred to the CPE and began to evolve into the TU. Historically, even with the former training unit based in the Human Resources Division, most of PennDOT's technical training and support activities were provided within each major division to meet division-specific training needs (i.e. Bureau of Design, Bureau of Construction, etc.). This approach continued even with the establishment of the TU. The programs and activities undertaken by the TU and the individual divisions within PennDOT are generally recognized by other DOTs as very successful; however, there are



Central Office units, including consultants). FDOT's approach is to monitor actual performance at a program and project level against established financial targets and project letting schedules. While closely linked, the development of FDOT's Work Program, including the identification of consultant projects, is detailed in another Best Practice Case Study: "Work Program Development."

FDOT considers the best measure of its effectiveness is the "delivering its Work Program". This means starting or committing the planned project phases (design, right-of-way, construction, etc.) on time (at a specified month in the fiscal year) and within budget (within the programmed amounts). FDOT's performance monitoring system determines the degree to which program delivery within these parameters is accomplished. In recent years, FDOT's measure of Work Program delivery has been in the range of 95% to 98%, a level considered excellent by the Department and its stakeholders.

Since FDOT contracts out nearly 90% of its design work and 100% of its construction program, the agency's performance monitoring system serves to track not only the status of individual projects and overall agency performance, but also the specific elements of the Work Program which are the responsibility of consultants. .

FDOT personnel see many benefits to the agency from using this process, including the ability of agency employees and managers to know the exact status of each project and higher levels of trust among FDOT, the public, and elected officials who are able to examine FDOT's transparent processes easily.

**Case 6:** **Consultant Evaluation**  
**Name:** **Consultant Evaluation System**  
**Owner:** **Ohio Department of Transportation (ODOT)**  
**Contact Person:** **Lyle Flower, P.E. – Office of Consultant Services**

This Best Practice Case examines the use of a computerized consultant evaluation system developed by the Ohio DOT. This system was implemented over a multi-year period and is designed to provide feedback to the consultant to improve his/her performance and help the department evaluate project performance. The development of the evaluation system is part of the overall departmental focus on improving project quality and project performance. An earlier attempt at developing a consultant evaluation system was unsuccessful. The current ODOT consultant evaluation system has been fully automated and its use is mandated by ODOT senior management.

ODOT is responsible for constructing and maintaining state owned transportation infrastructure in the State of Ohio. It carries out its responsibilities through its headquarters office and 12 district offices. Based in Columbus, Ohio, ODOT is a 6,300 member organization responsible for an annual work program of about \$1.15 billion. ODOT is responsible for transportation infrastructure in larger urban areas, rural farming communities, small and medium size cities, and in Appalachian communities.

ODOT uses an automated on-line consultant evaluation system to conduct its performance reviews. Depending on the nature of the project, the computerized system automatically generates the consultant evaluation form covering the important elements of the project (highway design, bridge design, traffic engineering, right-of-way plans, etc.). The system is available to all project managers in the headquarters and district offices, Consultant Services Office personnel, and senior management.

Consultants receive formal evaluations at the end of the project; however, ODOT project managers are also required to assess consultant performance and identify any

performance issues every quarter. A single grade is given at the end of the project with no separate ratings for specific submittals. A debriefing session is held with the consultant at the end of the project. For highway design projects, the project is kept active until the construction activities are completed. ODOT construction personnel assess the quality of the design plans based on experiences during construction. ODOT uses the results of the consultant evaluations (quarterly and final evaluations) as part of the consultant selection process for new projects.

**Case 7: Consultant Audits**  
**Name: Consultant Pre-Award and Post Audits**  
**Owner: Florida Department of Transportation (FDOT) and Pennsylvania Department of Transportation (PennDOT)**  
**Contact Person: John Greene – Office of External Audit – FDOT  
Jeff Rellick – External Audits – PennDOT**

A number of issues related to consultant audits have been examined by the North Highland Group (NHG) as part of this study, but within a separate report. This case supplements NHG information and focuses on the different practices used by the Florida DOT and PennDOT at two key points in the consultant contracting process: the pre-award audit and the post audit. Both agencies use these innovative practices for managing a heavy workload associated with consultant projects.

Both FDOT and PennDOT have shifted away from mandatory pre-award reviews on new contracts. The FDOT's Procurement Office sees auditing contracts less than \$500,000 as providing little value and tends to shift their resources to performing additional final audits.

PennDOT uses a more informal process for its pre-award reviews. This review takes place during their contract negotiations with the consulting firm once they have

been selected for a project. PennDOT's process has also shortened its cycle times by requiring firms winning more than \$250,000 per year in contracts to have an annual CPA audited overhead rate submitted to the agency.

FDOT was the only state where a site visit was conducted that has a formalized final audit process. FDOT performs final audits on a sampling basis, with the intention of focusing on projects with large contract amounts.

PennDOT has a process similar to a final audit called a "Contract Audit." These audits are selected using risk-based analysis, with factors including firm familiarity with PennDOT and firms with larger dollar contracts. This audit is performed on-site and incorporates a review of all open contracts with a particular consultant.

Although each agency's practices and organizational structures are different, each has found ways to reduce the delays associated with pre-award audits, strengthen the final audit process, and protect the integrity of the consultant contracting process. Each state is focused on compliance with federal and state statutes and eliminating fraudulent consultant activities.

## **Section 6: Other Good Practices**

During the process of identifying best practices in consultant program management within the targeted topic areas of interest to GDOT, a number of other methods, tools, and practices were identified through the pre-qualification telephone interviews and/or DOT site visits. These methods, tools, and practices did not individually rise to the level of a “best practice”, but did represent a useful approach or idea to facilitate consultant program management and other DOT functional responsibilities. A summary is provided below along with agency contact information.

### **Resource Allocation**

- “Transparent Boundary Projects”

The Ohio DOT uses a concept called “Transportation Boundary Projects” which allows various ODOT districts to serve as a consultant or production unit for another district. The district boundaries are considered transparent which allows other districts with production capacity to serve as a “consultant” to a district needing production assistance (surveying, engineering design, etc.) for projects. Instead of relocating ODOT staff or forcing a district to obtain external consultant services, Districts with unused capacity or expertise can “shop” their capabilities to other districts needing staff support. If no district can do the work, the job is advertised for consultant services. Transparent boundary jobs are identified in an annual process by Central Office. About 20 jobs per year are accomplished using this process. For more information, contact ODOT’s Consultant Services Office.

- “Portfolio Managers”

PennDOT’s District Office organizational structure includes a person who is responsible for monitoring the engineering production capacity within the district and among district project managers. Portfolio Manager makes resource decisions about whether to use in-house or external resources for production. For more information, contact PennDOT’s Bureau of Design.

### **Consultant Selection Process**

- Programmatic Consultant Selections

Rather than advertising consultant projects frequently throughout the year, Ohio DOT plans three major advertisements where multiple jobs are advertised. Consultants can request consideration for up to eight (8) projects within each advertisement. Selections are made from written technical proposals. Consultant advertisements are issued in April, August, and December of each year. Major projects are advertised separately and usually require oral interviews. For more information, contact ODOT’s Consultant Services Office.

### **Consultant Negotiations and Contract Development**

- Two-Phase Design Agreements

Ohio DOT uses an objectives-based scope of work to reach a point at 50% complete on its design jobs. The contract is developed on an actual cost basis (cost plus fixed fee) for this first phase of the project. Once the first half of the project is accepted by ODOT, the last 50% of the design is developed under a lump sum contract. This reduces the number of supplemental agreements that can occur due to design issues or changes in design parameters that differ from a

generic design scope of work. This approach enables ODOT to handle all required changes at one time at the mid-point of the design job and save money on design contracts. For more information, contact ODOT's Consultant Services Office.

- Development of a "Flexible" Contract

Ohio DOT is in the process of developing a standard contract that includes all possible activities needed to complete a base design document and any possible deviations. This gives ODOT's Project Managers maximum flexibility in obtaining and directing the consultant services that are needed for the project without having to do major contract modifications throughout the job. ODOT's goal is to give their managers as much power as possible without having to amend contracts. The flexible contract would identify the "standard objectives" and the "exceptions" that are covered. For more information, contact ODOT's Consultant Services Office.

- "Mutual Gains" Approach to Contract Negotiations

Florida DOT patterns its style of consultant contract negotiations after the Harvard Program on Negotiations. The basis of this approach is for both parties to recognize the needs of each other, knowing that some needs will be competing, and working cooperatively to get an agreement that serves the needs of both parties to the greatest extent possible. FDOT is training its own project managers and consultants on contract negotiations focusing on this style. For more information, contact FDOT's Procurement Office.

- Operating Margin Calculation Table

Rather than negotiating an operating margin (profit) of 10-15% for its projects, the Florida DOT has developed a calculation table for contract negotiators where the complexity of the project, the degree of risk, the schedule for the project, and cost control efforts are considered. A percent range for each of these factors has been developed and suggested standards for assessing the appropriate percentage have been developed for use by contract negotiators in the District Offices and Central Office. The new guidance will allow operating margins to range from 12% to 42% depending on the characteristics of the project. For more information, contact FDOT's Procurement Office.

- Electronic Contract Execution

PennDOT has devised an on-line system where consultant and construction contracts are routed throughout the agency for legal, fiscal, and senior management signatures and consultant signature (vs. sending hard copies around for signature). The process usually takes only a couple of days (or even just a few hours) to route the agreement to the consultant and DOT personnel for signature. For more information, contact PennDOT's Bureau of Design.

- Use of Centralized Contract Negotiators

PennDOT and Ohio DOT centralize their consultant contract negotiation activities to varying degrees. PennDOT requires that all consultant contracts must be negotiated by a Central Office negotiator. In Ohio, all projects over \$ 250,000 must be negotiated by the Central Office negotiator. Both agencies report benefits from having a higher degree of consistency in contracts using this

centralized approach. For more information, contact PennDOT's Bureau of Design and/or ODOT's Consultant Services Office.

- Flexible Consultant Contract Termination Clause

Wisconsin DOT uses criteria which allows either the consultant or the agency to terminate the contract on 10 days' written notice to the other party (for cause or no cause) or by mutual termination. This provision allows the agency to discontinue unsatisfactory consultant agreements quickly. If the contract is terminated, the consultant is paid for all acceptable work completed by the termination date. For more information, contact WSDOT's Consultant Services Office.

### **Production Management**

- "Reservoir" Projects

Ohio DOT requires each district to develop an additional 25% of their annual program in "production ready" projects that can be let for construction if unanticipated new funding materializes during the year. For more information, contact ODOT's Production Management Office.

### **Training and Project Management Capabilities**

- "Mandatory Technical Classes for Consultants

Ohio DOT has mandated that consultant firms send key staff to technical training courses as a condition of prequalification in certain disciplines, such as the preparation of environmental documents. This helps consultants deliver products consistent with ODOT's requirements. For more information, contact ODOT's Consultant Services Office.

## **Relationships with the Consultant Community**

- **Ohio Ethics Commission Rules**

The State of Ohio has issued directives which have greatly reduced fraternization among ODOT and consultants. The rules do not allow state employees to socialize in golf outings, for example. ODOT management indicated these rules have helped the agency establish the appropriate relationship with the consultant community and helped ODOT manage the consultant program more objectively.

- **Annual Consultant/Contractor/DOT Session**

PennDOT holds an annual meeting of all consultants, construction contractors, and key agency managers (Pennsylvania Partnerships) to discuss issues of common interest, such as new laws and regulations, upcoming consultant and construction program levels, and improving the quality of design plans and construction activities. Typically DOTs meet with these groups individually rather than in one combined session. For more information, contact PennDOT's Bureau of Design or Bureau of Construction and Materials.

- **Advance Notice of Consultant Opportunities**

Florida DOT provides detailed information of upcoming consultant projects in each district and in the Central Office at least 12 months in advance of the official consultant advertisement for the project. All consultant project activities are identified in advance through FDOT's Work Program development process and this information is readily available to the public and consultants. This allows plenty of time for consultants to make marketing decisions, develop

project teams, and research project needs prior to the official advertisement for consultant proposals. For more information, contact FDOT's Procurement Office.

- District Consultant Events

As a decentralized agency, Florida DOT District Offices hold consultant events to allow firms to meet DOT project managers, learn about upcoming opportunities, district priorities, etc. These events are in addition to the annual statewide event held in Central Florida. For more information, contact FDOT's Procurement Office.

- Joint DOT/Consultant Industry Committees

Florida DOT representatives work on joint committees with consultants to review and deal with issues related to consultant program activities on which there are mutual interests, but differing opinions. The purpose of the committee is to seek common ground and identify recommended solutions that both groups can accept. Members work on specific tasks and report back on the progress of the committees at quarterly or annual events which are open to both groups. For more information, contact FDOT's Procurement Office.

## **Audits**

- Use of an Audited Expense Rate

Up until 2002, Florida DOT had been experiencing a great deal of difficulty in negotiating detailed direct expense items, particularly for consultant construction engineering inspection (CEI) contracts. In late 2003, the agency will begin using an audited "expense rate" (similar to an audited overhead rate) which will be expressed as a percentage of direct labor or as a lump sum. The audited

rate will encompass all direct expenses, including computer-assisted drafting (CAD) expenses. Only large, unusual, single items where the cost is in excess of \$10,000 will be excluded from the audited rate. FDOT expects to reduce the time required to negotiate CEI consultant contracts substantially. Contact Person: For more information, contact either FDOT's Procurement Office or the External Audits Office.

- **Consultant Overhead Audit Package**

Florida DOT requires that all firms doing business with the agency (on projects over \$50,000) submit an overhead audit prepared by an independent Certified Public Accountant (CPA). The audit is good for one year and is used to write any contracts the firm wins during the year. For more information, contact FDOT's External Audit Office.

### **Quality Initiatives**

- **Quality Assurance Reviews**

According to FDOT procedures, the Central Office Professional Services Unit is required to conduct quality assurance (QA) reviews of consultant activities within each District every other year. The purpose of the review is to determine the District's compliance with established FDOT procedures. The District must formally respond to the QA findings. For more information, contact FDOT's Procurement Office or its Quality Initiatives Office.

- **Innovations Council**

PennDOT has empowered its senior management group, including the Deputy Secretaries and the Secretary of Highway Administration, to encourage

the identification of new ideas and ways to share them throughout the organization. For more information, contact PennDOT's Center for Performance Excellence.

- Customer Survey

The Delaware DOT conducts periodic surveys of firms and DelDOT staff on the effectiveness of its consultant process. For more information, contact DelDOT's Professional Services Office.

### **Other Agency Functions**

- "Agility Program"

PennDOT has established a partnership program with local governments where equal value services or products are bartered or traded. This program focuses primarily on maintenance and operations activities. An example of the program might be that a local government (city or county) agrees to paint or fix PennDOT's heavy equipment in exchange for PennDOT's plowing a rural road. This program is especially effective in rural areas or within counties having very limited maintenance and operations resources. The program emphasizes documenting the equal value of each party's contribution. The program is viewed by PennDOT as very successful in helping to deal with its own budget constraints as well as assisting local governments with scarce resources. For more information, contact PennDOT's Bureau of Municipal Services.

- Electronic Processing of Environmental Documents (Categorical Exclusions and Environmental Assessments)

PennDOT has devised a system where certain environmental documents (Environmental Assessments and Categorical Exclusions) can be routed through PennDOT and the Federal Highway Administration (FHWA) for approval using its on-line ECMS system. For more information, contact PennDOT's Bureau of Design.

- Electronic Permitting

PennDOT has devised a system whereby general state permits for waterway obstructions and other state permits can be applied for and approved using its on-line ECMS system jointly with the State Department of Environmental Protection. For more information, contact PennDOT's Bureau of Design.

- Electronic Grant Management System

PennDOT has developed an on-line system for grants management that can be used by DOT staff, local agencies receiving state and federal funds, and railroads receiving grant funds. For more information, contact PennDOT's Bureau of Public Transportation.

- Electronic Bidding System

PennDOT has developed an electronic system where bids from construction contractors can be generated, submitted, and evaluated on-line. The bid can be awarded by PennDOT, the contract can be developed, and documents can be approved and signed by agency personnel and the contractor using the PennDOT's on-line ECMS systems. For more information, contact PennDOT's Bureau of Construction and Materials.

## **Section 7: Summary**

While State Departments of Transportation have common responsibilities in the planning, design, construction, operation, and maintenance of state transportation systems, variations exist among the organizational structures, agency missions, laws and regulations, resources, and management approaches used by each agency. These similarities and differences offer many opportunities for state DOTs to share their experiences in managing various aspects of their overall transportation program and to provide assistance to their peers through the sharing of best practices information. This sharing of experiences and knowledge has been very valuable to this project and the identification of best consultant management practices.

The three State DOTs visited by the project team utilize strategic planning and management principles in relation to their consultant program management activities. Two of the three states have formally adopted strategic business models (FDOT and PennDOT). Although Ohio DOT has not formally adopted a specific strategic model, a focus on strategic planning can be observed from examining its business processes related to consultant management. These three states provide good examples of how strategic business planning can help a State DOT organization be responsive to and respected by its customers.

There is a long history of State DOTs sharing information with peers through various professional organizations, such as AASHTO, and informal relationships. The Florida DOT, Ohio DOT, and PennDOT organizations have been extremely generous in their sharing of information and experiences concerning their consultant program management and overall agency operations. During this project, representatives of each

agency have offered to continue communications and coordination on consultant program activities with GDOT staff members. Hopefully, a continuing relationship can benefit all parties and assist each organization in its consultant management activities in the future.

The following high-level, overarching themes were observed by the project team during the Best Practice Case Study work activities. Hopefully, these themes can be helpful to GDOT in planning and implementing its consultant program activities in the future. The Best Practice Cases highlighted in this document share certain qualities or characteristics.

- **Transparency**

Effective consultant program management practices are “transparent” and easily understood and visible to both DOT personnel and consultants. Many of the best practices employed by State DOTs allow for easy access and exchange of data and information by staff members, consultants, and the public at large. The transparency of processes helps a public agency explain what it is doing, why it is doing at, and gives the department a credible public position. Transparent processes reduce confusion, promote consistency of quality and outcomes, and help facilitate the agency’s performance. All three State DOTs highlighted in this Best Practice review have implemented transparent processes to manage its consultant programs.

- **Regularity**

Each of the highlighted Best Practices is used on a regular basis within the agency’s consultant program. Processes, procedures, and time frames are well defined and known, bringing more reliability to work flow. Regularity helps both

DOT staff members by letting them know what projects and processes are coming up. Regularity also helps the consultant community adequately plan for new opportunities and long term work assignments. All of the State DOTs using Best Practices have developed processes which are conducted on a regular basis to facilitate their consultant program management activities.

- **Independence**

While each of the processes, procedures, or approaches described in the Best Practices case studies can never be entirely independent of the political environment in which the organization must function, they are each as independent as possible from political influences. This independence is very important in a public service agency whose programs and projects often span a time frame that is longer than most elected officials are in office.

While a powerful public organization, such as a State Department of Transportation, can never (and should never) be separated from the process of governance and public oversight, insulating the Department's processes from undue political influences is very important. By providing sound, well organized processes leading to sound agency decisions can help an organization reduce efforts to circumvent its actions and disrupt agency activities. All three State DOTs visited by the project team (PennDOT, Ohio DOT, and Florida DOT) have developed strong, credible management processes related to consultant programs in particular, and strategic business processes, in general, that have reduced the potential for external pressure on agency decisions.

- **Consistency**

Each of the processes, procedures, or positions highlighted in the Best Practice cases is implemented in a consistent manner. This means that the “rules of the game” are defined for all of the players and the rules are used to manage the process. Deviations from the agency’s processes are infrequent because the processes are efficient, reliable, and produce good outcomes. This is especially evident in the case involving consultant evaluations. Consistency enables an agency to be fair and objective. Consistency also works to reinforce regularity. Having a regular and consistent processes, whether they involve the evaluation of consultants, the monitoring of consultant program performance, or development of a DOT Work Program, helps the organization get more work done efficiently. Consistency helps an organization deliver its transportation programs and services in a predictable and acceptable way.

Each of these characteristics reinforce one another. Transparency helps preserve independence and creates an environment for the organization to perform consistently. Independence from political pressures allows an organization to operate in a regular and consistent manner. While each characteristic is important in and of itself, the Best Practice cases taken together demonstrate the importance of using transparent, regular, independent, and consistent processes in consultant program activities.

**PART II: CASE STUDY DOCUMENTATION**

1. FDOT's Program and Resource Plan and Consultant Acquisition Planning
2. PennDOT's Engineering and Construction Management System (ECMS)
3. FDOT's Professional Services Information (PSI) and Contract Invoice Transmittal System (CITS) (Automation and Consulting Invoicing Case)
4. PennDOT's Transportation University
5. FDOT's Production Management and Performance Monitoring System
6. ODOT's Consultant Evaluation
7. FDOT's and PennDOT's Consultant Audit Activities

## **BEST PRACTICE CASE 1: RESOURCE ALLOCATION**

### **“Program and Resource Plan and Consultant Acquisition Planning Process”**

#### **Florida Department of Transportation**

##### **Introduction**

A critical part of any organization is evaluating its performance over time. Tracking performance allows an organization to measure how it is meeting its goals and helps to identify problem areas. It also helps a public sector organization build and maintain credibility with the public and elected officials. As the use of consultants increases in state Departments of Transportation (DOT) throughout the country, many state DOTs have found it necessary to develop ways to track the performance of their consultant contracts and in general the performance of their overall organization. Of the states examined for this project, the Florida DOT (FDOT) has the most comprehensive and integrated performance tracking procedures in place, including measures related to its consultant contracting.

One of the critical parts of evaluating performance is the baseline that performance is measured against. This document illustrates how FDOT allocates its available resources across program areas, including consultant program activities, and develops its five-year Work Program and annual Production Management and Performance Plan against which District and Central Office units are evaluated and financial and project letting performance is measured.

##### **DOT Background**

The Florida Department of Transportation (FDOT) is the state agency responsible for constructing and maintaining state-owned transportation infrastructure in the State of

Florida. FDOT is a 7,500 member organization responsible for an annual Work Program which includes approximately \$2 billion in construction lettings. The agency is comprised of a headquarters office based in Tallahassee and eight district offices located throughout the state, including the Florida Turnpike Enterprise, based in Orlando. FDOT is a decentralized organization and is responsible for planning, designing, constructing, maintaining, and operating transportation infrastructure in large metropolitan urban areas, rural farming communities, small and medium size cities, and in variety of coastal and environmentally sensitive settings.

The organization views consultants as necessary extensions of staff since the sheer volume of projects FDOT is responsible for could never be accomplished without a near doubling of in-house staff. Consultants are currently responsible for over 80% of design and 100% of the construction engineering inspection (CEI) services in the state. All of the construction projects undertaken by FDOT are done with contractors. The current political climate is openly committed to reducing the number of state employees with an associated increase in privatization. FDOT uses consultants or contractors for virtually every production and operations function it has.

### **Detailed Description**

FDOT's Program and Resource Planning process is comprised of two major components:

- Allocating available resources among FDOT's major programs and sub-programs over a five-year period; and
- Providing the detailed basis for developing an agency-wide listing of projects or project phases that are planned to be initiated (and programmed) at a particular time – FDOT's Five-Year Work Program.

Once FDOT's Work Program is formally adopted by the Secretary each year on or about July 1<sup>st</sup>, the agency creates two reports to track the delivery of the projects identified in the first year (the current year) of the program. One report is referred to as the "Performance Report" and the other is referred to as the "Production Management Report". They are very similar in content and appearance.

The Performance Report is a summary of all projects and project phases that are included in FDOT's Work Program on the first day of its fiscal year (July 1). The Production Management Report includes all of the project and project phases included as of July 1 as well as any program changes (new projects or project phases) that have occurred since the program was adopted on July 1. The Performance Report is what the FDOT has announced to the public that it plans to do in the coming year and functions as the baseline for measuring agency performance. The Production Management Report includes all projects included in the Performance Report, but also incorporates any unexpected projects such as emergency repairs or special projects. This document describes how the projects included in these reports are determined.

FDOT monitors the delivery of its Work Program through a process called "Production Management". It uses both its Statewide and District Performance Reports and its Statewide and District Production Management Reports to track its progress in program delivery throughout the fiscal year on a monthly basis.

### **Program Development**

Each year, FDOT develops a five-year Work Program in accordance with state law and federal transportation requirements. The program is developed in cooperation with metropolitan planning organizations (MPOs), local governments in rural areas, the

public, and a very large pool of stakeholders throughout the state. These additional stakeholders include the consultant community, the construction community, business leaders, etc. By early January of each year, the draft Work Program, including all projects for each district and the Central Office, is available for public review. It is also at this time the draft Work Program is reviewed by the Florida Legislature. FDOT's annual budget consists of funding for all of the project activities included in the first year of the work program plus additional appropriations for in-house staff and the operation of its facilities (buildings, toll plazas, etc.).

The Work Program identifies the key actions which must be accomplished before the end of the fiscal year for major program units in the organization. Some of these actions may be the negotiation and execution of consultant agreements, some actions may be construction project lettings, some actions may be right-of-way parcel acquisitions, etc. The program identifies the projects or project phases by district and major functional area and tracks the performance of the responsible entity within FDOT for accomplishing these actions.

For example, for each District, FDOT monitors the total number of consultant contracts and the total dollar amount of consultant contracts. FDOT's Work Plan identifies these measures in annual totals, individual monthly figures, and cumulative amounts throughout the fiscal year. The report also shows totals by district and totals by project phase (planning, design, right-of-way, etc.).

### **Consultant Acquisition Plan**

In order to develop its Consultant Acquisition Plan (which is based on the first year of FDOT's adopted Work Program), each district identifies the month of the current

fiscal year when each contract in the plan will be executed. The Plan provides a listing of the anticipated completion of contracts by month for each district and the total dollars expected to be committed (placed under contract) each month. The determination of when a contract should be executed is determined by when a project should be constructed and the availability of funds to support the project. Therefore, if a project should be open to the public on a specified date, a desired construction date is set based upon estimated construction time. This construction start date then provides the date the design plans must be finished and environmental documents must be obtained. The length to create these documents then leads to a date for the completion of the planning process, which leads to when the initial planning effort should be started. Therefore, the desired completion date drives the release of all contracts from planning to final construction.

An estimate of the cumulative amount of consultant contract amounts is then calculated for each district. An effort is made to ensure that work is spread evenly throughout the year to avoid having too much cash drawn down at one time and to make sure the State has enough money dedicated to FDOT so that the agency can pay its bills. Once the dollar amount for each consultant project is estimated and project phase is programmed in the work program, a Consultant Acquisition Plan is created by each district for the consultant projects within its jurisdiction.

The list of anticipated projects by month for each district becomes the “Plan” line on which the district is evaluated. Districts cannot get credit for completing the contract(s) and meeting the “Plan” unless the funds for the project have been encumbered in FDOT’s accounting system (the last official step in the contract development

procedure). Statewide programs are listed as part of the Central Office project responsibilities.

The districts submit their individual performance plans to FDOT's Central Office Production Management Unit which is responsible for the overall program monitoring. These district work plans are merged into a statewide work plan that is submitted to Secretary and that becomes the official document used to monitor the agency's performance.

The draft Work Program is refined as part of the legislative process in the spring of each year and is submitted for adoption to the Secretary of Transportation for his/her signature on July 1 of each year. Once the Secretary adopts the Work Program, the first year or "current year" of the program is "locked down" by FDOT Central Office staff (Production Management Unit) and the program provides the basis for FDOT's Performance Report. Any program changes made during the year (after July 1) are incorporated into the Production Management Report.

More simply put, the steps in the development of the Consultant Element of FDOT's Work Program are:

1. The agency's Central Office Program Management Unit develops the Program and Resource Plan which distributes available funding to all FDOT programs and subprograms.
2. The Districts, in coordination with the Central Office Program Management Unit, develop the agency's Five-Year Work Program.
3. As part of the Work Program process, each District identifies which projects will need consultant resources (for all projects throughout the five-year program).

4. In the spring of each year, the Districts develop their Consultant Acquisition Plan which shows the month of contract execution and contract amount expected to be committed for each project/project phase. Concurrently, the Work Program is reviewed by the State Legislature and formally adopted by the Secretary of Transportation on July 1<sup>st</sup> of each year.
5. All of this information is then compiled by the Program Management Office for each district and the Central Office which becomes the basis for program monitoring through the use of FDOT's Production Management and Performance Reports.

FDOT's Adopted Work Program and a great deal of supporting information including anticipated project lettings, etc are available on-line through the internal infonet for staff and to the general public via the internet. Due to Florida's "Government in the Sunshine" Law, all information, except items explicitly identified in state law, is available for public review upon request, including the Work Plan

### **Implementation Process**

FDOT did not have a single implementation program for its Program and Resource Plan and Work Program processes. The structure for these processes and the performance monitoring activities have been part of FDOT's management for over 20 years. Over time, they have evolved into their current state.

Pressure to manage the Program and Resource Plan and Work Program development processes is both internal and external. FDOT's executive managers must be able to answer questions at the statewide level about the agency's use of taxpayer money for transportation. Program delivery is also a key component of FDOT's adopted

Sterling Business Model. Therefore, senior managers and employees throughout the organization recognize the relationship between FDOT's Work Program delivery, the success of its primary business practices, and credibility in the community at large. Accountability for program delivery starts at the top and is defined at every level of the organization, including with individual Project Managers who want to make sure their projects are performing well.

External pressure comes from a number of sources, including state and local elected officials interested in FDOT's Work Program, and construction and consultant interest groups who must gauge their business operations in relationship to FDOT's program. The real estate and economic development community (developers, etc.) also monitor FDOT's program delivery to learn the type, magnitude, and location of major highway improvements throughout Florida. The timely delivery of FDOT's Work Program is very important to local governments that must approve land development projects in relation to the availability of transportation infrastructure. Thus, the reliability of FDOT's Work Program is significant to many individuals, groups, and organizations around the State.

### **Obstacles**

There were no directly stated obstacles to implementation of these processes by FDOT officials. However, there are some interesting observations that can be made based on the way the processes have been developed. Their evolutionary nature suggests that they were not coordinated solely from a top-down approach and therefore developed on an ad hoc basis. An interesting aspect of these processes is also their transparency to others outside the organization. The Program and Resource Plan and the FDOT Work

Program helps define upcoming projects and program levels across a five-year period, about six months in advance of the program being adopted formally by the Secretary of Transportation.

### **Benefits**

FDOT personnel listed many benefits from the program. One of the most important aspects of the Work Plan is its transparency. By allowing the districts to develop their own Work Program and clearly defining what projects will be contracted and let, how much those projects cost, and when those projects will take place, many managers and employees throughout the organization are invested in the success of FDOT's transportation program. They can all know what the agency's objectives and activities are for the year and into the future and can plan accordingly.

The reliability and transparency of FDOT's Program and Resource Planning and Work Program development process also creates an environment where legislative intervention in programming is minimized and the development of the FDOT's annual budget becomes a simple matter of arithmetical addition. FDOT's financial requirements for the first year of its Work Program plus the requirements for its in-house operations taken together are the basis for the agency's annual budget. These processes are integrated and work to improve the credibility of the Department with the Legislature and the public.

The process also allows FDOT the ability to track where and when program funds are being committed and if they are being committed according to its own Work Program – an activity that is perceived by the agency managers themselves to be critically important. The monitoring process is also documented in a Best Practices Case Study.

FDOT's Production Management staff is very interested in expanding the performance tracking to grant programs and all other units within the agency. However, this expansion is limited by availability of funding and training.

### **Lessons Learned**

The evolution of the Program and Resource Plan and Work Program processes over time has led to a transparent and self-sustaining system that enables FDOT to more effectively track its projects and the delivery of its overall agency responsibilities. Several lessons have been learned through this experience.

- A realistic vision of the agency's capabilities and accomplishments expressed through its Work Program helps the agency organize its resources and communicate priorities throughout the agency.
- The needs for consultant support and the level of funding for consultant activities can be programmed as an element of the DOT Work Program over the long term.
- The system for identifying consultant projects should be transparent to DOT staff members and the consultant community.
- Involving multiple parties within the DOT to identify consultant projects and needs helps with organization communications, priority-setting, and overall management.

## **BEST PRACTICE CASE STUDY 2: AUTOMATION AND INFORMATION SYSTEMS**

### **“Engineering and Construction Management System (ECMS)” – PennDOT**

The Pennsylvania and Florida Departments of Transportation have been nationally recognized for their progressive implementation of information technology into their daily operations, including their consultant management programs. The Pennsylvania Department of Transportation (PennDOT) is most noted for their Engineering and Construction Management System (ECMS), a “paperless” system used to manage its consultant and construction contracting programs as well as other administrative, management, and human resource activities. Florida DOT (FDOT) has used an incremental approach to developing automated systems to facilitate consultant program management. PennDOT’s technology initiatives related to consultant management are documented in this case. FDOT’s initiatives are documented in the following case.

While many state Departments of Transportation utilize the worldwide web for consultant advertisements and/or information sharing about consultant program activities, PennDOT’s ECMS provides consultants with a comprehensive source of information about project advertisements, anticipated projects, project selection results, and contract development activities. ECMS also provides PennDOT project managers with numerous on-line tools to manage the various tasks and activities associated with the design and construction of PennDOT projects. In addition, ECMS enabled electronic signatures on contracts from both the consultant and PennDOT personnel, substantially shortening the

time needed to circulate, sign, and distribute executed contracts. In late 2003, the system will also be expanded to handle the agency's construction contracting activities.

### **DOT Background**

PennDOT is the state agency responsible for planning, designing, constructing and maintaining state-owned transportation infrastructure in Pennsylvania. PennDOT maintains approximately 249,000 miles of total lane miles, 5,500 of which are part of the National Highway System. Pennsylvania spends more than \$1.55 billion for the state's highway work program. It is a highly decentralized agency with a headquarters office responsible for overall policy and procedure with 11 strong district offices responsible for carrying out agency operations. The PennDOT staffing level is currently at about 12,000 employees with the staff being based either in its headquarters office in Harrisburg, PA or in one of its district offices.

PennDOT views their consultants as essential DOT partners who help the agency deliver its Work Program to the public. PennDOT has strategically reinforced this partnership through their business processes, actively engaging in developing consultant utilization strategies. PennDOT does not foresee an increase in its in-house staffing levels, despite a dramatic increase in its recent workloads. These increased workloads were and are a result of increased federal funding for transportation and increased state and local resources being dedicated to transportation.

PennDOT hires consultants as extensions of its staff; however, the agency recognizes its responsibilities as the "owner" of transportation infrastructure that cannot be contracted to another party. Accordingly, PennDOT tends to utilize consultants for

assignments requiring specialized expertise or for projects with time frames that are not conducive to using their in-house staff.

### **Detailed Description**

Over the past ten years, State DOTs have sought ways to expedite program delivery amid an environment of increasing political and public expectations and shrinking in-house resources. More and more DOTs have chosen technology to meet these needs.

In 1997, PennDOT initiated an agencywide process reengineering effort which culminated in a very large investment in information technology. ECMS alone required an investment of more than \$ 45 million. This investment, though large, has resulted in a huge cache of benefits. With strong support from the Governor, the Secretary of Transportation, and top agency executives, PennDOT has developed and deployed a coordinated framework of information technology systems to support their operations, including consultant program activities. In addition to ECMS, PennDOT has developed technology systems to help manage other important agency functions, including:

- **Categorical Exclusions/Environmental Assessments Expert System (CE/EA)**  
This system expedites the review and approval of certain environmental documents (Categorical Exclusions and Environmental Assessments) for projects.
- **Joint Permit Application/Hydrology & Hydraulics Expert System (JPA/H&H)**  
This system expedites the approval of certain state environmental permits in cooperation with the State's Environmental Protection Department.
- **Multi-modal Project Management System (MPMS).**

This system facilitates the management of grants to transit systems and airports throughout the state.

- **Rail Freight, Ports and Waterways System (RFPWS)**

This system facilitates the management of grants to freight railroads and port authorities for transportation projects.

The crown jewel of PennDOT's process reengineering and technology investment has been the ECMS. ECMS is a web-enabled data management tool that tracks projects from conception to contract closeout. It also supports the functional units within PennDOT that are responsible for key tasks and activities needed to carry out the agency's work program. ECMS was envisioned to meet four major needs:

- **Reduction of the Costs of Design Work** - PennDOT's cost for transportation design was rising in relation to their overall cost of highway maintenance and construction. The project development process for the design phase was taking longer and costing more. The Department needed a more efficient system that would reduce the time for design in order to deliver projects quicker and at lower overall costs.
- **Management of an Increasing Project Portfolio** - Project lettings have increased from \$800 million in 1996 to over \$1.3 billion dollars in 1999. This also meant a doubling in the number of projects that must be managed by PennDOT with the same number of engineers, portfolio managers, and technical experts.
- **Improvement of Project Delivery** - PennDOT manages more than 2,000 transportation design projects simultaneously. The design projects can be complex and span multiple fiscal years. They also may require the coordination of numerous parties including engineering consultants, contractors, federal, state and local

agencies. As part of ECMS development, PennDOT implemented a process and on-line tools which can be used by Project Managers managing a number of individual projects and by Portfolio Managers who are responsible for resource decisions among multiple project managers and projects within a district. The Project Managers and Portfolio Managers use a computerized project management system within ECMS to track and monitor projects and programs.

- **Improve Performance Management** - ECMS is based on streamlined business processes and automation in order to reduce project cycle times and costs for the design and construction process. ECMS has been implemented to include mechanisms to monitor the new business processes and provide performance measures for PennDOT management to use in managing and further improving the design and construction processes.

PennDOT managers state that the approach used to implement ECMS was a result of several major factors. While the agency had existing management systems to support consultant and contractor activities prior to ECMS, but they were mainframe-based system and very limited in scope. The systems could handle invoices for contracts, but the agency was facing a growing need for standardization of processes for its offices in districts throughout the state.

There was also a need to have the consultant community have access to key PennDOT publications, technical guidance, and information. ECMS consolidated and enhanced the functions of PennDOT's existing contract management systems for consultants (the EMS – Engineering Management System) with the system for

construction contractors (the CMS – the Construction Management System). PennDOT then added functionality to ECMS to satisfy the remainder of their demands.

ECMS became operational on December 18, 2000. The ECMS system operates on Pennsylvania's Commonwealth Technology Center (CTC) fiber backbone. PennDOT, however, is responsible for their own server infrastructure, firewalls and networks (PENNDOT, CAD and GIS).

The ECMS application provides the consultants with the following functionalities:

- View Planned Projects
- View advertisements for Consultant Services
- Maintain Qualification Packages, Employee Rosters and Overhead Rates
- Submit Statements of Interests, Technical Proposals and Overhead Rates
- Submit Electronic Contract Signatures
- Submit and Track Invoices
- Access to Reference Information, Standards, and Detailed Technical Guidance

In addition, it provides the PennDOT Project Manager and Consultant Contracts Office personnel with reporting mechanisms that monitor the status of the project (project milestones, key dates, and cost).

### **Implementation Process**

PennDOT began with a strong commitment to work cooperatively with the consultant and contractor communities to develop their systems. Their implementation process involved over 300 individuals from the agency and its external partners. For the ECMS system, a Steering Committee of agency staff members was created to design the work processes. This group worked with the Department's Strategic Management Committee to implement the system.

It was recognized early in the process that some components of the system needed to be available to the public. PennDOT used Joint Application Development (JAD) techniques to design ECMS. These techniques are thought to lead to faster development times and greater client satisfaction, because the client is involved throughout the development process.

In comparison, in the traditional approach to systems development, the developer investigates the system requirements and develops an application, with client input consisting of a series of interviews. PennDOT utilized work groups with representatives from Central Office and the Districts who advised the project team on the content of the system and the priority of system elements and enhancements. A chronology of key events in the evolution of ECMS follows in Table A2-1.

*Table A2-1: Significant Events in the ECMS Implementation*

<b>Time Frame</b>	<b>Project Activity</b>
October 1998	Electronic bidding for construction contracts is operational, but bids were submitted to PennDOT in paper format
December 1999	An Interim Consultant Agreement System was developed (as a result of Y2K concerns)
December 2000	The Consultant Services element of ECMS began operations
July 2002	The remaining ECMS systems were launched

PennDOT organized the ECMS deployment into a series of “waves” for development and implementation. These waves reflected the sequence in which different business functions would be implemented. This approach provided the following benefits:

- **Provided business benefits as soon as practical** - A total of five waves were defined. PennDOT bundled these business functions into functional groups. This approach ensured that PennDOT staff would not have to wait unnecessarily for the system development processes to be finished for other functional units.
- **Reduced staffing requirements** - The wave approach allowed PennDOT staff to transition from one wave to another to minimize the peak staffing requirements for the project.
- **Reduced overall project risk** - Each wave had a separate work plan and schedule to prevent the waves from running over budget or schedule. Any schedule or budget over-runs could be identified more quickly than if PennDOT had managed the ECMS as one large, all-encompassing project.

PennDOT developed its implementation program with five (5) ECMS waves:

- Wave 1 - Electronic Bidding System
- Wave 2 - Project Management Pilots
- Wave 3 - Consultant and Project Management Functions
- Wave 4 - Engineering and Project Management Functions
- Wave 5 – Construction Management System (CMS) 2000 and Historical Data Management

Approximately \$45 million was required to reengineer PennDOT's business processes, purchase the necessary hardware infrastructure, and complete software integration and development. PennDOT identified these funds directly from the Motor License Fund which comes to the Department as a dedicated funding source. In addition to infrastructure investment, PennDOT utilized a consultant team for automating and Internet enabling the consultant selection, agreement and invoice processes. Due to the

size and complexity of the system, it now takes PennDOT 15 personnel to keep the ECMS platform operational and up to date.

### **Obstacles**

Since the implementation of ECMS, a major challenge for PennDOT has been to get train its workforce on how to use the system. PennDOT managers state this is a major priority for the agency and as more people are trained, the usage of the system is expanding. Training the consultants and other business partners in the system's use has also been a hurdle to overcome; however, PennDOT provides assistance through on-line tools and training sessions.

### **Benefits**

The ECMS system is viewed by PennDOT officials as very beneficial for a number of reasons, although the benefits are difficult to quantify. The system enables PennDOT to align its management philosophies with its technology systems to help its personnel deliver the organization's products and services more efficiently.

- ECMS was created as a very “district-centric” and “project management-centric” system to mirror PennDOT's organization (Central Office and District Office responsibilities) and facilitate its actual work flows (the initiation, checking, and approving of activities).
- The system also supports PennDOT's project management philosophy of a project manager taking the project from its beginning (design) to its completion (construction).
- ECMS provides better reporting to the Central Office and Districts more in depth and at a higher level of accuracy than was available before the system.

- It enables project managers to focus on technical issues vs. time-consuming administrative tasks.

In 2002, the ECMS system enabled PennDOT to deliver a transportation program of \$ 1.5 billion (in 750 projects), its highest annual volume ever. As the interstate highway program and major freeway construction programs in Pennsylvania have wound down over the past several years, the nature of PennDOT's program has changed. While the overall letting levels have remained high in dollar value, the number of projects has increased. System preservation and smaller reconstruction projects are the focus of the program instead of major new highway capacity projects. The ECMS system supports PennDOT's production activities (engineering and construction) and its mix of current smaller-scale projects.

### **Lessons Learned**

Automated systems allow agencies to deal with reductions in staffing and the challenges resulting from job turnover. Automation, while resource-intensive during implementation, offers long run benefits to agencies facing a need to streamline their operations. These automated systems also provide additional capabilities for information and data archiving and information sharing among many people.

PennDOT professionals involved in consultant program activities reported several "lessons learned" from their experience in implementing technology systems.

- Although identifying funding to develop and implement these IT systems can be difficult, PennDOT is convinced of the value of the systems in terms of more efficient agency operations and better interaction with consultants and contractors.

- PennDOT officials believe it is essential to involve in-house users of the system, the consultant community, contractors, and other business partners in the technology system development to ensure its success.
- Agency managers must be convinced of the value of the technology systems to ensure their use after they are implemented.

**BEST PRACTICE CASE STUDY 3: AUTOMATION/INFORMATION SYSTEMS  
AND CONSULTANT INVOICING**

**“Professional Services Information (PSI) System and  
the Contract Invoice Transmittal System (CITS)” – Florida DOT**

FDOT is staging its consultant management and information systems program toward an ECMS-like system (PennDOT’s approach), but is incrementally implementing information systems into its consultant management process. FDOT’s Professional Services Information (PSI) system is FDOT’s main database for consultant program activities. The system is mainframe-based and is accessible to FDOT staff and consultants via the internet and FDOT intranet. PSI is used to collect and maintain basic data about consultant firms, project advertisements, short-list and selection results, consultant grades, etc. It was developed and is maintained by FDOT’s Contractual Services Unit at their headquarters in Tallahassee.

Implemented in 2002, FDOT’s newest technology system is the Contract Invoice Transmittal System or CITS. The system allows consultants (and construction contractors and other vendors) to create and submit invoices to the Department; allows FDOT project managers to review and approve the invoices for payment; and forwards them to FDOT’s Financial Office and the State Comptroller’s Office for consultant payment. The system maintains a centralized database for all financial transactions. FDOT’s average turnaround from invoice transmission to payment of invoice has been reduced from its previous average under a manual system of about 45 days down to seven (7) to ten (10) days.

## **DOT Background**

FDOT is the state agency responsible for planning, designing, constructing and maintaining state-owned transportation infrastructure in Florida. FDOT maintains approximately 250,000 miles of total lane miles, 4,300 of which are part of the National Highway System. Florida spends almost \$2.5 billion for the state's highway work program.

FDOT is also a highly decentralized agency with a headquarters office responsible for overall policy and procedure with strong district offices responsible for carrying out agency operations. FDOT's employees are based in the headquarters office located in Tallahassee or in one of seven district offices around the State or in the Florida Turnpike Enterprise office located in Orlando. The agency also operates a Materials Testing Lab in Gainesville.

FDOT's total workforce reached about 10,000 employees in the mid-1990s, but retirements, attrition, and a recent public policy to reduce the number of state employees in Florida has reduced FDOT's staff to about 7,500 employees. FDOT does not foresee any increase in their in-house staffing levels and have dramatically increased their consultant utilization to meet the demands of their annual work plans.

## **Detailed Description**

Although narrower in scope than PennDOT's system, FDOT has also received support for its technology investment from its Governor, Secretary of Transportation, and the Florida Legislature. FDOT has recently upgraded its investments in information technology yielding the Professional Services Information (PSI) System, FDOT's consultant program database, and the Consultant Invoice Transmittal System (CITS).

FDOT's Professional Services System was developed by the agency's Central Office Contractual Services Office in 1991. The system has been upgraded several times and has enabled FDOT to maintain information on prequalified consultants, consultant contact information, consultant overhead rates, the names and contact information for certified disadvantaged and minority enterprise firms, FDOT project managers, upcoming contracts, advertisements, short-listing, long-listing, and selection results, and consultant evaluations.

CITS became operational on September 14, 2000, automating FDOT's payment system for all contracts, including consultants. The system also provides FDOT with the ability to query the status of invoices at a statewide-level. FDOT has experimented with the addition of an electronic signature process as part of the CITS system, but has not yet implemented it fully.

The development of this system has been very significant for FDOT. Prior to CITS, the State Comptroller's Office chose to audit each invoice submitted from a state agency prior to payment, which amounted to thousands of invoices each year from FDOT alone. Under the testing of the CITS system, it was found the potential for error was so small from the FDOT system that the State Comptroller elected to pay FDOT's invoices electronically without the prior audit. This has saved a huge amount of time for FDOT staff and the consultant community.

CITS is a web-enabled package for both FDOT and the consultant, operating within defined constraints, thereby ensuring consistency and conformity. The Professional Services Unit in each District and in Central Office (depending on where the agreement is initiated) is responsible for creating a new contract file, assigning it an

appropriate contract number, and entering a project description. FDOT personnel also enter data including the dollar value of the contract, contract initiation and closure dates, execution dates, contract type, method of procurement, FDOT Project Manager's name, names of FDOT technical reviewers, and the consultant firm's contact information.

CITS provides a rate table that lists the work type, unit and price per unit for the contract (as appropriate). It also tracks milestones for contract advertisement, shortlisting, proposal received, consultant selected and Notice to Proceed. The consultant listing provides a menu of pre-qualified consultants with their vendor numbers and status, allowing the user to select the prime consultant and subconsultants as needed. CITS was developed with the intention of streamlining and expediting the payment of contractors (consultants, construction contractors, and vendors) by eliminating time- and labor-intensive manual processes and review/approval times.

### **Implementation Process**

FDOT's implementation team and available resources were much smaller than PennDOT's. The developers of FDOT's systems included primarily Central Office Procurement Office and Financial Services staff members. Both PSI and CITS operate on Florida's State Technology Office's fiber backbone with FDOT responsible for site development and maintenance.

The Professional Services System was written in-house in the computer language SAS. The software was developed on a mainframe and consultant and FDOT employees can only access the system through terminals with access to the mainframe. CITS was developed in the database package FoxPro, but is web-enabled so consultants and FDOT personnel can access the system at any computer with an internet connection. The costs

of implementing the PSI and CITS systems are hard to determine, since the systems development were done incrementally (especially in the case of PSI) and with in-house FDOT staff. A full-time professional is assigned to the development and maintenance of the PSI system. Similarly, an individual in the Central Office Procurement Unit is responsible for managing the operations of the CITS system.

### **Obstacles**

FDOT staff members identified a number of impediments to more fully integrating technology into its consultant program operations. They reported that some middle managers were reluctant to support the new technology systems due to their potential to replace staff or jobs. Additionally, technology systems can enable an organization to do much more work than with manual processes. Thus, there was a need to overcome some serious reservations about the technology systems from the people who needed to use them most and would be the most impacted by them. In FDOT, there is no organizational unit whose overall mission is to improve business practices and processes on a continuous basis and recommend actions to streamline them. Given this situation, the PSI and CITS systems had to have champions within the Central Office Procurement Unit as well as the technical capabilities and authority to implement the systems in the District Professional Services (Procurement Units) throughout the organization.

Another major impediment to implementing major technology systems is finding the financial resources. This is often a huge hurdle for a public agency. FDOT's current technology systems supporting consultant management have been the result on in-house management and staff initiative, not an over-arching effort at process reengineering.

In some cases, it may be useful to link the need for these systems with strategic planning efforts. Since information technology investments are typically very large, it is very useful to tie the investment to large agency-wide initiatives to improve organization performance or strategic planning. This allows the cultivation of high-level political support from agency executives, the Governor and his/her staff, external partners, and/or the State Legislature to facilitate funding for the systems.

### **Benefits**

With decentralized Departments of Transportation, such as FDOT, comes the opportunity for variances in how work flow is handled and in the quality of final products. Such variances are difficult to address in a highly decentralized environment where decision-making is distributed throughout the organization. However, with the use of more automated systems, FDOT has found that a major benefit from the implementation new technology has been a higher level of accuracy, consistency of work, and standardization of procedures. One official stated that this higher level of consistency could never have been accomplished without the introduction of these new technology systems.

### **Lessons Learned**

Automated systems allow agencies to deal with reductions in staffing and the challenges resulting from job turnover. Automation, while resource-intensive during implementation, offers long run benefits to agencies facing a need to streamline their operations. These automated systems also provide additional capabilities for information and data archiving and information sharing among many people.

FDOT managers and professionals involved in consultant program activities reported several “lessons learned” from their experience in implementing technology systems.

- Although getting the internal support and resources to implement these systems can be difficult, FDOT Procurement Office managers are convinced of the value of the systems in terms of more efficient agency operations, higher levels of quality (consistency), and better interactions with the consultant community.
- FDOT’s experience illustrates how even modest investments in automation and technology can reap good results, including benefits to its consultant program.
- FDOT Procurement Office officials believe it is essential to involve the consultant community and other outside partners in the technology system development to ensure its success.
- Agency managers must be convinced of the value of the technology systems to ensure their use after they are implemented.

## **BEST PRACTICE CASE STUDY 4: TRAINING AND PROJECT MANAGEMENT**

### **“The Transportation University” – PennDOT**

#### **Introduction**

State Departments of Transportation (DOTs) are using a variety of ways to upgrade and enhance their internal staffing capabilities, particularly in the area of project management. The agencies are encountering increased staff turnover, especially in their senior ranks, due to the retirement of “baby boomers” and the downsizing of public sector organizations. DOTs have always faced the need to help retool the job competencies of their employees as job requirements changed or new requirements occurred.

This case will examine an extraordinary effort by PennDOT to grow its in-house staff capabilities, including those of its engineering and non-engineering project managers. The case will also discuss other innovative practices by the Florida DOT and the Kentucky DOT to address workforce needs and project management capabilities.

In the mid to late 1990s, the Pennsylvania DOT (PennDOT) entered a period focused on strategic planning and management, developing a customer-oriented environment, and streamlining business processes. According to PennDOT staff members, the beginning of a more strategic perspective in PennDOT operations began as a result of a lengthy period in the 1970s and 1980s when the agency’s reputation and public image were not good. The agency’s leadership during the 1990s began changing this situation.

In late 1997, PennDOT adopted the Malcolm Baldrige Performance Excellence Criteria. This action resulted in virtually every unit within the Department undergoing some form of assessment and identification of opportunities for process improvement. Part of this effort included the establishment of PennDOT's Center for Performance Excellence (CPE) and within it, its Transportation University (TU).

PennDOT's training unit, formerly housed within its Human Resources Department, was transferred to the CPE and began to evolve into the TU. Historically, even with the former training unit based in the Human Resources Division, most of PennDOT's technical training and support activities were provided within each major division to meet division-specific training needs (i.e. Bureau of Design, Bureau of Construction, etc.). This approach continued even with the establishment of the TU.

The concept of the Transportation University was borne from PennDOT's continuing quality improvement initiatives and its increased focus on meeting its strategic planning and management objectives. According to a PennDOT staff person, in 1997, the Deputy Secretary for Administration at the time stated the agency's training programs were not as effective as they needed to be and set about to revamp the system to more closely align it with the agency's strategic objectives.<sup>16</sup>

The programs and activities undertaken by the TU and the individual divisions within PennDOT are generally recognized by other DOTs as very successful; however, there are differing opinions within the organization itself on the reasons for this success. This case will explain the concept of the TU and its structure, the divisional responsibilities for training, and how both facets of PennDOT's approach to training are implemented.

## **Background**

PennDOT is a decentralized organization with its headquarters office based in Harrisburg and 11 district offices located around the State. The agency currently has about 12,000 employees. During the mid-late 1990s through 2001, the agency's construction contract letting levels were about \$ 700 million annually. In 2002, the agency let \$ 1.6 billion in construction projects.

Similarly, PennDOT's consultant program has grown. During the 1996-1998 time frame, total consultant program levels were in the range of \$ 120 – 130 million per year. Starting in 1999, the consultant level grew to \$ 200 million. In 2003, about \$ 300 million will be committed in consultant contracts. According to PennDOT's Chief of the Design Services Division, "...consultants are very, very necessary to delivering our transportation program for the citizens of Pennsylvania...".<sup>2</sup>

The agency has utilized consultant resources for many years, but within the last five years, the consultant program level has more than doubled. The two reasons for this are increased federal transportation authorizations due to the Transportation Efficiency Act for the 21<sup>st</sup> Century (TEA 21) and the agency's inability to increase the number of its own employees. In the mid 1970s, PennDOT had over 23,000 employees and has slightly over one-half that number today, with a program level several times larger than 30 years ago.

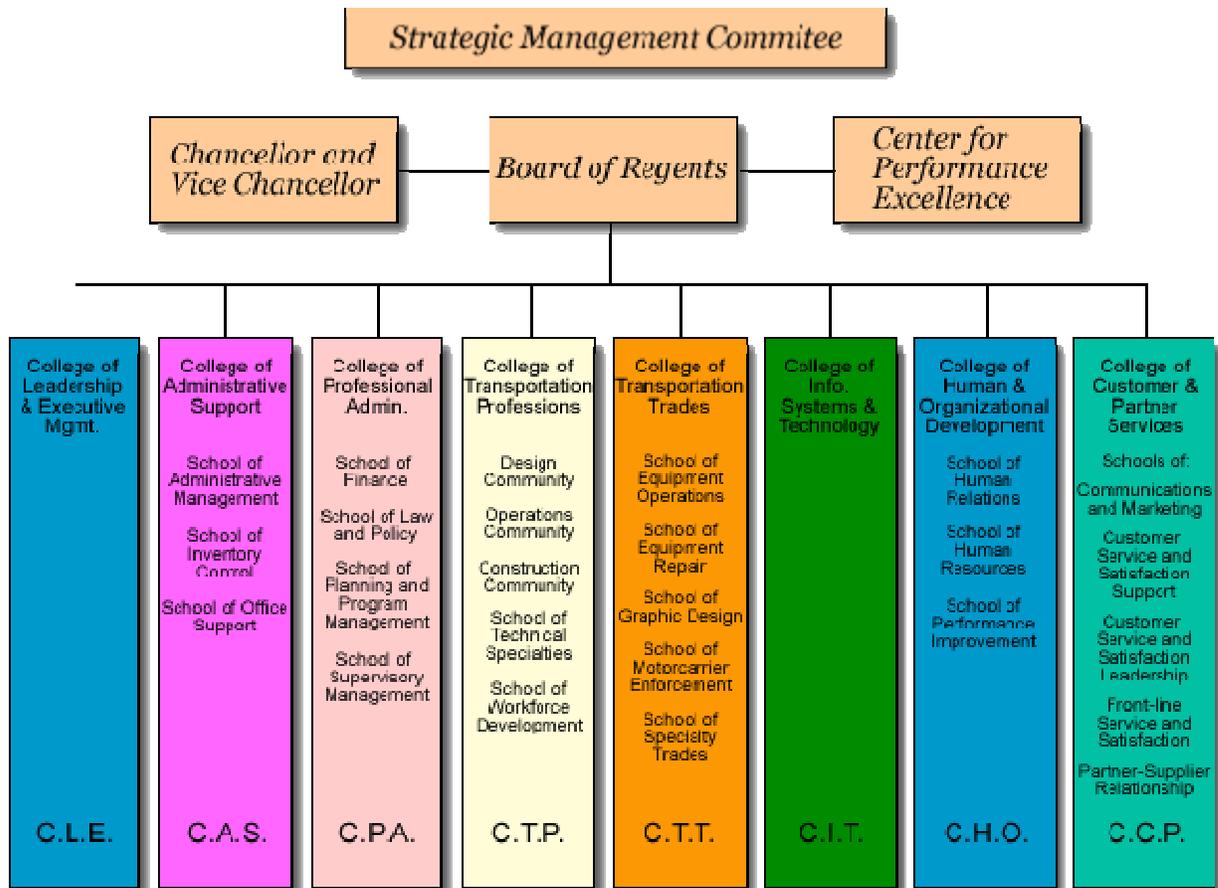
PennDOT established its Transportation University (TU) using a traditional academic model. Similar to an institution of higher learning, TU's governance structure includes a Board of Regents, Chancellor, and several Colleges and Schools to deliver its programs. TU is staffed with approximately eight to ten professionals (based within the

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<sup>6</sup> Telephone Interview with Shand Stringham in June, 2003.

Center for Performance Excellence) who focus on providing leadership academies for managers and supervisors and certifying PennDOT technical courses for Continuing Education Unit (CEU) credits. Figure A4-1 illustrates the organization of PennDOT's TU.

Figure A4-1: PennDOT's Transportation University Organization



The various divisions within PennDOT each have small training staffs (two or three individuals in each division) guiding the technical training activities and delivering the majority of the technical training available at PennDOT. This two-pronged approach to organizational learning is unusual within State DOTs. In 2002, the Bureau of Design delivered over 300 courses to its Design Community (in-house staff, consultants and others working on design-related projects). This does not include the general

management, supervisory, and technical courses offered by the TU and the other various divisions within PennDOT.

In 1998, as part of PennDOT's agencywide process reengineering effort, the agency developed a "paperless" process for managing its engineering and construction programs, called the "Engineering and Construction Management System" or ECMS. A major focal point for organizational training efforts, especially within the Bureaus of Design and Construction, has been the use of the ECMS system. According to PennDOT's Acting Chief Engineer and ECMS Project Manager, "...PennDOT is a very district-centric and project manager-centric organization...".<sup>7</sup> The ECMS system was developed with this perspective in mind. The development of the ECMS system is documented in a separate Best Practice case study.

As part of the ECMS system, PennDOT registers its "business partners", including consultants, contractors, local governments, and vendors, and provides access to the agency's automated systems, technical guidance documents, and training information. Almost 6,000 PennDOT employees have access to the system. About 510 consultant firms and 1,033 construction contractors are registered business partners. Nearly 400 registered business partners are associated with the PennDOT's design program. The training programs for PennDOT staff, consultants, construction contractors, and local government partners, many of which involve the ECMS system, are provided through the Transportation University. Recently, PennDOT won the Pathfinder Award from the American Association of State Highway Transportation Officials (AASHTO) for the ECMS system development.

### **Detailed Description**

As mentioned previously, during the mid-to-late 1990s, PennDOT was operating in an environment of increased public and political expectations for program delivery, the need to develop various types of partnerships to deliver transportation programs, and the need to streamline its processes. It is within this context that the concepts for developing the CPE, the Transportation University, and the ECMS System were created.

The CPE was created to provide a range of services to support agency-wide strategic planning tied to adopted Malcolm Baldrige quality criteria, including performance measurement, leadership development, and training. Key aspects of the CPE's operation include training for PennDOT managers on Baldrige concepts and performance criteria and assisting them with process improvement efforts. The CPE also provides a group of Relationship Managers who work one-on-one with the district offices, county governments, and PennDOT bureaus who need individual technical support.

The TU is a distinct unit within the CPE and its mission is to plan and organize an agency-wide approach to training and professional development. TU staff coordinate with the various divisions within PennDOT to identify training needs, develop and deliver courses, and evaluate the effectiveness of training programs.

There is a difference of opinion within PennDOT concerning where the leadership for the training programs is being expressed. Some believe that the TU is taking the leadership role in developing a proactive, agencywide training program for the agency; although the TU does not actually deliver courses, except for its Leadership Academies for supervisors and managers. Some believe that much of the leadership for PennDOT's training initiatives is actually occurring within the major divisions. Currently, the

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<sup>7</sup> Interview with James Ritzman (Bureau of Design) on May 21, 2003.

individual PennDOT divisions are heavily involved in identifying training needs, developing and delivering courses, and evaluating the courses. These activities are oriented toward improving the specific competencies of PennDOT's in-house staff, consultants, contractors, and local government partners and to support PennDOT employees with their long-term career development.

PennDOT uses a tool called a Position Analysis Worksheet (PAW) to identify the required job competencies for an individual job and the necessary competencies and job requirements necessary to complete the job in a "stellar" manner.<sup>8</sup> Once these requirements are identified, the individual employee's training needs are then assessed. The needs of groups of employees are then identified through a process implemented by each major PennDOT division.

TU also supports PennDOT's overall Strategic Planning and Performance Measure activities by strengthening employee competencies and performance to achieve PennDOT's strategic goals. PennDOT communicates its strategic goals in its publication entitled "*Moving Pennsylvania Forward*". This strategic agenda document describes PennDOT's approach to program delivery by identifying the agency's vision, mission, values, strategic focus areas, and strategic objectives. The details of PennDOT's strategic planning process may be viewed on-line at [www.dot.state.pa.us](http://www.dot.state.pa.us). This strategic planning process involves customers, stakeholders, partners, suppliers, and employees.

In a larger context, the CPE is involved in larger scale strategic planning and management activities through its work on Organizational Climate Surveys (in association with Penn State University); an Organizational Benchmarking Methodology;

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<sup>8</sup> Interview with Shand Stringham, PennDOT Chief Learning Officer in June, 2003.

and a Customer Segmentation Program (in association with PennDOT's driver licensing operations).

### **Technical Requirements**

The training and professional development programs offered by the TU and PennDOT's divisional training units are focused on competency-based training and long-term professional growth. According to PennDOT, twenty-five (25) functional schools are overseen by eight colleges, each of which is dedicated to a particular area of expertise. TU's colleges are headed by key PennDOT leaders and other senior-level professionals who serve as Deans, including three Deputy Secretaries, four Bureau Directors, and the Chief Engineer. They serve in the TU roles in addition to their regular full-time jobs. The Board of Regents is comprised of all of the Deans and reports to PennDOT's Strategic Management Committee (key executives). The Deputy Secretary for Administration services as the Chair of the Board of Regents. The Director of the Center for Performance Excellence (CPE) serves as the University's Chancellor.

The University's support staff is led by the Chief Learning Officer and provides assistance on training and professional development to the various colleges, schools, and operating committees. There are also Training Coordinators for all Engineering District and Central Office Bureaus.

Apart from the Bureau-specific training programs provided by individual PennDOT offices, the TU focuses on:

- Managing the overall organizational processes and procedures related to training and professional development;

- Provision of Continuing Education Units (CEUs) as a certified provider by the International Association for Continuing Education; and
- Creating partnerships with colleges and universities to deliver degree programs for PennDOT employees.

PennDOT (TU and Bureau) training courses are open to PennDOT employees, consultants, and local government personnel. The agency believes that training consultants is important to getting the quality of work from consultants that is required. According to the Manager of the Human Resources Development Section (Bureau of Design), "...consultants should be trained so they know what we want.....there are many ways of completing a task, but a consultant may not do it in the way DOT needs (without proper training)..."<sup>9</sup>

Each year, all of the Training Coordinators within the major District Offices and Bureaus hold discussions with managers regarding training needs for the upcoming year. The Training Coordinators work with a team of individuals within each division who are able to identify the division's training needs (need for training on new computer systems, etc.). Each bureau develops a detailed training program and schedule to meet the needs within that particular office. These plans are balanced against available funding and workload constraints. PennDOT training coordinators also serve as information resources within their divisions on training courses delivered by other state agencies which can be attended by PennDOT employees. Training courses are delivered by PennDOT and other agencies throughout the state in three regional locations (East, West, and Central) and in some cases, in individual districts.

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<sup>9</sup> Interview with Jim Ritzman on May 21, 2003.

The delivery of courses is coordinated through the various Bureaus within PennDOT and within the TU. Information is also share with employees and registered business partners through the ECMS system. Sample listings of courses provided through each of the colleges and schools can be found on line within the EMCS system on PennDOT's website.

Another unusual feature of PennDOT's training efforts is that most of the courses require the student (employee) to pass an examination following the course; however, detailed statistics on the number of employees passing various courses, etc. are not available. However, the exams are viewed by PennDOT staff involved in training programs to be very valuable in assessing the effectiveness of the individual classes.

According to PennDOT's Human Resource and Development Manager for the Bureau of Design, about 320 courses are offered to PennDOT's Design Community which is comprised of PennDOT employees, consultants, and others involved in the design aspects of transportation infrastructure. The HRD unit for the Bureau of Design has two full-time employees and one summer intern assigned to it. PennDOT's Construction Division has a similar organization. A major focus of the training efforts within both the Bureau of Design and PennDOT's Construction Division over the past several years has been the use of the ECMS system by in-house staff, consultants, and contractors.

The ECMS contains a Training Calendar covering a wide array of courses available to PennDOT employees and consultants for major functional areas (project management, roadway design, environmental documents, etc.). The calendar specifies the course title, whether it is mandatory or not (for PennDOT personnel), and the date(s)

and location of upcoming training sessions. The ECMS system allows PennDOT personnel to query the training database for each organizational unit to identify:

- Course Information Summary Listing
- Course Calendar
- Course Schedule
- Contact Information (by functional area and organization)

The calendar also identifies the course size, the training vendor, and trainer/instructor's name(s). Other information is provided including directions to the training location, duration of course, dress code, comments, registration deadline, cancellation deadline, costs (for PennDOT personnel and others).

Training courses are provided on hundreds of topics, including the various elements of the ECMS system. ECMS allows PennDOT to manage hundreds of activities and functions related to the design and construction of transportation facilities throughout the State using a combination of in-house staff and a significant level of private sector (consultant and contractor) resources. The key training courses are provided through the ECMS framework including:

- Consultant Selection & Agreements
- Consultant Invoicing
- Consultant Evaluation
- Project Management
- Portfolio Management
- Project and Contract Monitoring
- Cost Estimating
- Design Project Setup
- Cultural Resources
- Final Design and Plans, Specifications, and Estimates (PS&E)
- Pre-qualification of Contractors
- Bid Package Preparation
- Contract Awards
- Contractor Evaluation
- Subcontractor Approval
- Work Order Processing

- Verification and Payments
- Claims Tracking

In addition to the engineering and construction contracts, PennDOT uses a separately managed process to procure non-engineering services. The major difference between the two processes is the consideration of price in the selection of non-engineering services. Training on the various aspects of non-engineering contracts and services is also provided by PennDOT through the TU.

### **Implementation Program**

The implementation of TU was largely an in-house effort to redirect the focus of PennDOT's training program using already budgeted resources. Even with the establishment of the TU, PennDOT continued its practice of providing an extensive array of training through its major bureaus and offices. These courses are now incorporated into PennDOT's ECMS system.

Funding for the TU (excluding the costs of personnel, contracts, etc. within the major divisions, bureaus, and district offices, etc.) is about \$ 200,000 per year. The TU is funded with a portion of the State's regular apportionment of federal transportation funding. No special state or federal funding was used for the creation of the TU. The majority of the agency's training expenditures come from the operating budgets of the divisions, bureaus, and offices throughout PennDOT. Since training is handled through these operating budgets which are controlled by individual agency managers, it is not easy to determine the total expenditures for the entire TU operation.

### **Obstacles**

The biggest obstacle to the TU and its operation is that everyone involved in it already has a full-time job at PennDOT (except for the TU support staff based within the

Center for Performance Excellence). PennDOT management believes “that giving people an opportunity to participate in the TU and make a difference is the primary motivating factor for the employees’ long-term involvement.”<sup>10</sup>

It should be noted that in 2002, there was a major change in state government administrations in Pennsylvania. It is not yet clear if the new administration will continue the current direction of the CPE and TU. Given the shortage of state revenues faced by DOTs across the country at this time, including PennDOT, it is very likely that training budgets will be significantly reduced. It is not clear how the revenue situation at PennDOT will affect its training operation, including the TU.

### **Benefits**

One of the most obvious benefits of the Center for Performance Excellence and the Transportation University is the clear linkage between PennDOT’s strategic objectives and the management of its human capital. The agency’s framework for providing training and professional development is very elaborate and much more extensive than most State DOTs. The existence of the CPE and TU together with the extensive network of training staff based within each of the agency’s major divisions and district offices expresses a very strong agency commitment to helping employees improve their job competencies as they relate to PennDOT’s mission and strategic goals. Given recent economic conditions and funding constraints, it is not clear yet whether PennDOT will be able to sustain this framework over the long term.

Previous PennDOT executives have been convinced of the TU’s value in dealing with job turnover, including the large number of retirements, helping the organization to link its strategic goals with its training initiatives, and focusing on quality improvement

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<sup>10</sup> Telephone interview with Shand Stringham, Chief Learning Officer, in June, 2003.

through better training. It is not known whether the reduction in available revenues coupled with the change in state administration will alter the structure of the TU.

### **Lessons Learned**

PennDOT officials expressed several opinions concerning the lessons learned from the Transportation University experience.

- Some PennDOT managers believe that the over-reaching structure of the TU is responsible for the success of the agency's training programs. Some people believe that empowering many PennDOT team members within the bureaus and District Offices to plan, develop, and deliver training is the reason the program is so successful.
- There is broad agreement that aligning the organization's training programs with the strategic objectives of the organization is extremely important. Training resources are then allocated to the accomplishing the core objectives of the organization, thereby minimizing the waste of time and personnel resources."<sup>11</sup>

### **Other Innovative Practices**

In addition to PennDOT's unique approach to training and the development of project management capabilities, Florida DOT has chosen a different approach. Concerned about the loss of its senior-level professional, it has chosen to strengthen its in-house project management and strategic management capabilities by establishing a Project Management Research and Development Unit within its Quality Initiatives Office.

Ohio DOT is also strengthening the capabilities of its own project managers and also consultant project managers by developing detailed guidance for project

management which is available in hard copy or on-line. These documents are used to educate the agency's project managers and the consultant community on their respective roles and responsibilities to facilitate ODOT's consultant program activities.

To address the agency's continuing need for new engineering professionals, the Kentucky Transportation Cabinet (KTC) recruits high school students for civil engineering positions after their graduation from college. KTC's program helps pay for their college education and provides summer job opportunities. The program, implemented in 1948, continues today as an excellent source of engineering talent for the organization. All of these approaches are described in more detail in the following section.

### ***Florida DOT***

The Florida Department of Transportation (FDOT) is responsible for the planning, design, construction, operations, and management of the State Highway System. FDOT is responsible for about 39,703 lane miles of roadways and 6,253 bridges. It works in cooperation with transit systems, airports, ports, and railroads to create a multimodal statewide transportation system. According to FDOT's website, the agency's mission is "...to provide a safe transportation system that ensures the mobility of people and goods, enhances economic prosperity and preserves the quality of our environment and communities".<sup>12</sup>

The Florida DOT is a decentralized organization with its headquarters office based in Tallahassee. This office is responsible for developing the State's transportation policy and procedures, training programs, technical assistance, quality assurance, and the

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<sup>11</sup> Telephone interview with Shand Stringham in June, 2003.

<sup>12</sup> Florida DOT website.

planning of certain aspects of the State's transportation system (the Florida Intrastate Highway System – the FIHS – for example). FDOT's eight district offices, located around the state, are responsible for planning, producing, building, and maintaining the transportation system. FDOT currently has approximately 8,700 employees. The agency is led by the Secretary of Transportation and two Deputy Secretaries. The districts are each led by a District Secretary and in general each has major divisions for Administration, Planning, Production and Operations, as well as a Public Information Office and General Counsel's Office.

FDOT uses consultants in nearly every program and sub-program area it manages. It uses a comprehensive and systematic approach to allocating available resources to its various programs and sub-programs each year. This process is called the Program and Resource Plan process. The process involves FDOT's executive leadership team, including its Central Office and District Office leadership. The details of this process are highlighted in a Best Practice Case Study.

FDOT estimates that about 200 professionals serve as Project Managers for the various Planning, Design, Right-of-Way, Traffic Engineering, Environmental, and Public Transportation projects it undertakes. This does not include the staff members throughout the organization that are responsible for the administrative duties associated with the consultant programs. About 20% of FDOT's workforce is based in the headquarters office with the remaining 80% located throughout the State in eight district offices, including the Florida Turnpike Enterprise based in Orlando.

In 2003, FDOT determined that it needed a more focused effort to develop and maintain its in-house capabilities for project management. Since the late 1990s, the

agency has been losing important human capital resources, due to retirements of “baby boomers” and a public policy goal of reducing the number of government employees. However, during this period, FDOT was expected to deliver a higher program levels, particularly in construction contracts. In 2002, the Department produced its largest program ever in over \$ 2 billion of construction contracts.

According to FDOT’s Production Management Manager, the agency’s 2002/03 construction letting program level is somewhat reduced (estimated at \$ 1.2 billion down from \$ 2 billion in 2001/02).<sup>13</sup> Despite this reduction in construction activity, the loss of important senior-level engineers and other transportation professionals is continuing to negatively impact the agency. .

Starting in the 1998, as part of a new state government administration, an increased focus was placed on reducing the number of public employees, including the FDOT workforce. A statewide program to provide financial incentives for the early retirement of state employees has resulted in the loss of hundreds of long-time FDOT employees, leaving a knowledge and experience vacuum within the organization. This impact is still being felt within the organization. FDOT’s executive management team has been working to address this issue and one of its initiatives was the reorganization of the agency’s Project Management Office into the Project Management Research and Development Unit (PMRD).

FDOT has been focused on improving the capabilities of its in-house staff, particularly its managers, for several years. During the 1990s, FDOT was heavily committed to delivering a Certified Public Manager (CPM) curriculum for both Central and District Office staff. This program was available to all state agencies in Florida;

however, FDOT was recognized as one of the few agencies that wholeheartedly embraced the program and encouraged hundreds of its employees to participate.

This program required a significant commitment of time with periodic two-day training modules scheduled over a two-year period. The program was instrumental in providing more access to public management concepts (general supervision, communications, performance monitoring and evaluation, etc.) to senior- and mid-level individuals in FDOT who may not have had access to this training previously. While some general concepts of project management were discussed in the program, it primarily stressed the “people” side of management in the context of a public sector organization.

While FDOT’s commitment to the training and professional development continued, the organization began to be especially hard hit by the job turnover in its senior ranks, especially in the Division of Operations, beginning in the late 1990s. This FDOT division is responsible for operating and maintaining the State Highway System and for overseeing the construction activities associated with FDOT infrastructure. While 100% of the construction engineering inspection activities had been handled by consultants for some time, the loss of senior-level FDOT professionals who were experienced in overseeing and managing consultants on large construction projects was viewed as critical. To help strengthen FDOT’s internal capabilities to handle this responsibility, it created the PMRD to implement programs to address this situation.

Up until 2003, FDOT’s Project Management Office had been based within the Bureau of Design to support the project management activities of in-house staff and consultants. In 2003, it was determined by FDOT’s executive managers that a more comprehensive and consistent approach to project management throughout the agency

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<sup>13</sup> Interview with John Cross, P.E. on May 14, 2003.

should be developed. It was determined that a high priority for the Quality Initiatives Office in general and the PMRD unit specifically should be enhancing the in-house project management capabilities of FDOT's professionals working in Construction.

In its new role, the PMRD unit is linked to FDOT's overall strategic direction in its human capital management. The unit is now responsible for cultivating innovative project management practices throughout all the functional units in FDOT and undertaking research and development efforts to strengthen FDOT's in-house project management capabilities. While it began its work focusing on FDOT's Construction activities, the unit is now in the process of developing a comprehensive training program for its Design professionals. The PMRD is considered a best practice because of its unique role in the State DOT organization to specifically focus on enhancing employee competencies across divisional boundaries in project management.

As an initial activity, the PMRD unit is working on a survey of "best practices" throughout the U.S. related to project management systems. The group focused on state departments of transportation, but also included private sector firms and transportation agencies outside the U.S. The group developed a screening questionnaire to identify the organizations with the most to offer in project management practices. During 2003, the PMRD unit will visit the selected organizations and document their best project management practices.

The group focused on state departments of transportation, but also included private sector firms and transportation agencies outside the U.S. The group developed a screening questionnaire to:

- gather data about the organization's structure,
- its use of project managers, and

- its project management practices in construction activities

Each responding organization was given a code number and the results of the survey were compiled by organization code. Once the survey results were compiled, a group of PMRD staff members reviewed the results of the survey and ranked the responding organizations to determine the “best practice” organizations. The high-ranking organizations included:

- Western Office – Federal Lands Program – Federal Highway Administration
- Wisconsin DOT
- New Hampshire DOT
- Arizona DOT
- Illinois DOT
- North Dakota DOT
- Eastman Kodak Company - Colorado
- Unisys Company
- Eastman Kodak Company – New York
- Alabama DOT
- North Carolina DOT
- Raytheon Company
- U.S. Department of the Navy

The PMRD units intends to conduct site visits and information exchange with these organizations to develop FDOT project management approaches, procedures, training, and support services.

In addition to the “Best Practices” project, the PMRD Unit is in the process of developing a comprehensive “Project Management Guidelines” document, including best practices cases. In the past, individual work units or divisions (Planning, Design, Right-of-Way, Construction, etc.) have developed their own manuals to train and assist their project managers; however, overall guidance for all FDOT project managers in all functional units was not available. The increasing focus of the agency in managing

private sector firms to carry out Departmental functions is making the issuance of this guidance very important.

The PMRD is also organizing and delivering training modules in Project Management for both FDOT employees and consultant staff. Recently, the focus has been on training project managers in the Construction Program. The cost of the training is free to FDOT employees. Consultants pay a minimal amount (usually less than \$ 75/day) to cover the cost of the training site, etc. FDOT and consultant professionals teach the course modules. There are four modules in the training program, each with two sessions of two days each. Thus, the training program is a significant commitment of time. Future training efforts will focus on the design of transportation infrastructure.

FDOT's PMRD unit is now staffed with four full-time positions. It is unlikely the in-house staff for the unit will grow, thus the unit is using consultants to help develop and deliver its programs. This is due to the budget constraints resulting from the national economic downturn, a situation being felt by most State DOTs at this time.

The main obstacle to implementing the PMRD unit has been limited in-house staffing resources and building support for the program within middle management. FDOT has a history of empowering each major division or functional area to develop its own approaches to project management which differ from office to office and district to district. While there are certain procedures to guide FDOT's operations, general philosophies about project management differ throughout the organization. The biggest challenge for the PMRD unit is to build support for its activities within these major divisions.

FDOT's executive-level management is firmly supportive of the PMRD Unit and was instrumental in its creation. This level of management believes the establishment of the PMRD Unit helps the agency deal effectively with the challenges of losing long-time senior professionals by strengthening the capabilities of its in-house staff, particularly those responsible for managing consultant activities. The unit also helps the organization achieve progress in meeting its strategic goals as identified in the adopted Sterling Business Model.

The Manager of Training and Development for FDOT's Quality Initiatives Program stated that the most important lesson learned from the PMRD experience has been "the importance of working with the consultant community as partners. The consultant community understands the importance of FDOT having strong in-house project management capabilities and can be effective allies. The consultant community has volunteered its own time to teach courses and help FDOT develop its project management programs."<sup>14</sup>

### ***Ohio DOT***

ODOT has recognized the need to enhance its consultant project managers' capabilities by compiling a comprehensive guide for managing consultant contracts and training course entitled "Consultant Contract Administration". The manual was developed by ODOT's Consultant Services Office and is distributed to its project managers and contract managers as a primary reference for the agency's training courses on consultant management. About 200 professionals have been trained. By the end of 2003, ODOT expects to develop a comprehensive, formalized Project Management program.

ODOT is a decentralized organization with its headquarters office (in Columbus, OH) responsible for policy and procedures and general agency oversight. According to discussions with agency personnel, the headquarters office is responsible for the consultant selection activities, negotiations, and contract development activities. ODOT's 12 district offices are responsible for the management of the consultant contracts once they are finalized. ODOT separates the responsibilities for consultant management between "project managers", the professionals responsible for the technical aspects of the project, and "contract managers", professionals based in the Consultant Services Office, who assist the project manager with the administrative aspects of consultant management (preparation and development of contracts, supplemental agreements, etc.).

ODOT has utilized consultants for many years. Currently, about two-thirds of the agency's program is delivered by consultants and contractors. By state law, ODOT's total number of employee cannot exceed 6,000 people.

ODOT conducts training on a variety of subjects for its own staff, consultants, and representatives of local governments. According to ODOT's Manager of Consultant Services, the mix of participants helps everyone understand how ODOT does things. The mix also provides a good forum for the discussion of issues.

Technical courses are provided by ODOT on the preparation of environmental documents, construction engineering documentation, bridge design, right-of-way plans preparation, right-of-way acquisition and other topics. Some of the courses are required for ODOT prequalification. ODOT also operates a Traffic Academy for local government personnel.

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<sup>14</sup> Telephone interview with Jim Cunningham, Quality Initiatives Office, in June 2003.

The Consultant Services Office staff (located in ODOT's headquarters) conducts training for ODOT project managers and other professionals involved in consultant activities (contract managers) throughout the state several times each year. The course is also delivered on request from District Offices who may have hired several new project managers (or contract managers) since the last class was held.

The Consultant Contract Administration Manual and training course covers the following topics in detail:

- Introduction to the Manual: Purpose and Procedures
- Laws and Regulations
- Cost Accounting and Definitions
- Agreements
- Contract Managers and Project Managers
- Consultant Selection Process
- Price Proposal, Negotiation, and Authorization
- Basic Duties in Administering a Contract
- Specialized Services
- Modification Procedures
- Breach of Contract
- Consultant Negligence

In addition to the manual, the ODOT Consultant Services Office has published other documents to assist their project managers, contract managers, consultants, and others involved in consultant program activities. ODOT's "Specifications for Consulting Services (dated January 1998)" provides very detailed direction about the requirements and obligations of consultants providing services to the agency.

It is unusual for a State DOT to specify in such detail the responsibilities of the consultant in writing. Most often, this direction is provided through "trial and error" experiences or verbally from various agency staff members involved in consultant programs. Both the Contract Administration Manual and the Specifications for Consulting Services represent best practices due to the breadth and depth of information

provided for both ODOT staff and the consultant community and the effort to be proactive in identifying consultant and ODOT project responsibilities.

### ***Kentucky Transportation Cabinet***

To continuously add to its cadre of engineering professionals, the Kentucky Transportation Cabinet (KTC) has instituted its Scholarship Program. The program offers an opportunity to two students from each of the State's nine highway districts each year to attend the University of Kentucky. Detailed information about the program can be found on the KTC's website.

Although not the sole criterion for selection, the Cabinet tries to choose students who represent the State's diverse highway districts. Over the years, the program has also been expanded to include pre-engineering programs at Kentucky State University and Western Kentucky University. All students must finish their education at the University of Kentucky. An eligible student may apply in the fall of the year to the engineering program at the university of his or her choice for admission the following year. Students may also apply for admission to community colleges with the intent to transfer once they have completed at least 10 semester hours in mathematics, physics, and chemistry.

To be eligible for a KTC scholarship, a student must graduate from an accredited Kentucky high school or be a high school graduate and Kentucky resident and meet admission requirements of the chosen university. Selected students sign a contract with the written approval of a parent or guardian to work full time for the KTC immediately after graduation. Students must agree to work one year for each school year for which they receive a scholarship. The Cabinet also provides summer employment as long as

students make reasonable progress in their academic work and they perform satisfactorily in summer work assignments.

Students are expected to make normal progress toward a degree and maintain a minimum cumulative grade point average of 2.5 (out of a 4.0 scale). Upon the student's graduation, he/she is assigned by the KTC to a district office based on the Cabinet's needs. The program also provides an opportunity for students to pursue a Master's degree in civil engineering (a five-year program).

Freshmen and sophomore students currently receive a stipend of \$ 3,200 each semester. Junior and senior students receive \$ 3,600 each semester. If the student chooses not to work with the KTC after graduation or leaves the program before graduation, he/she must repay the stipend to the KTC.<sup>15</sup>

Once the graduate joins the agency, he/she begins a two-year rotation program through the various divisions of KTC. This is an opportunity to learn more about the Department and helps young professionals decide on their future career path. Since the program has been in operation for over 50 years, there are second and third generation students participating now.

KTC believes the program is a cost-efficient arrangement that is good for students as well as the organization. KTC saves time and money that would be spent on recruiting. According to Dr. Jim Wang, Coordinator for the program at the University of Kentucky, "our partnership with the State enables the University to recruit some of the very best engineering students. It also ensures a well-educated cadre of highly qualified employees to fulfill the State's needs and improve overall engineering expertise."<sup>16</sup>

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<sup>15</sup> Information from the KTC website

<sup>16</sup> Information from the KTC website

**BEST PRACTICE CASE STUDY 5: PERFORMANCE MEASURES**

**“Production Management and Performance Monitoring Process” – Florida DOT**

## **Introduction**

A critical part of any organization is evaluating its performance over time. Tracking performance allows an organization to measure how it is meeting its goals and helps to identify problem areas. It also helps a public sector organization build and maintain credibility with the public and elected officials. As the use of consultants increases in state Departments of Transportation (DOT) throughout the country, many state DOTs have found it necessary to develop ways to track the performance of their consultant contracts and in general the performance of their overall organization. Of the states examined for this project, the Florida DOT (FDOT) has the most comprehensive and integrated performance tracking procedures in place, including measures related to its consultant contracting. This case directly relates to a previous Best Practice Case Study involving FDOT's Program and Resource Plan and Work Program Development Process. One of the critical parts of evaluating performance is the baseline that performance is measured against. This document illustrates how FDOT measures the actual performance of their annual Work Program against which financial and schedule targets are measured. This performance monitoring process also involves consultant program management.

## **DOT Background**

The Florida Department of Transportation (FDOT) is the state agency responsible for constructing and maintaining state-owned transportation infrastructure in the State of Florida. Based in Tallahassee, FDOT is a 7,500 member organization responsible for an annual Work Program which includes about \$ 2 billion in construction project lettings. The agency is comprised of a headquarters office based in Tallahassee and eight district

offices located throughout the state, including the Florida Turnpike Enterprise, based in Orlando.

FDOT is a very decentralized organization and is responsible for planning, designing, constructing, maintaining, and operating infrastructure in large metropolitan urban areas, rural farming communities, small and medium size cities, and in variety of coastal and environmentally sensitive settings. The agency views consultants as necessary extensions of staff since the sheer volume of projects FDOT is responsible for could never be accomplished without a near doubling of in-house staff. Consultants are currently responsible for over 80% of design work in the state and 100% of the construction engineering inspection. FDOT contracts out all of its construction activities as well. The current political climate is openly committed to reducing the number of state employees, including within FDOT, with an associated increase in privatization. FDOT uses consultants or contractors for virtually every function it has.

### **Detailed Description**

FDOT uses an established process to allocate funds to each of its major program areas and sub-programs. Using these allocations, a detailed Work Program is developed in conjunction with the public and stakeholders each year. Consultant programs are specifically identified in the Work Program process and specify the level of consultant resources in each major functional division (and district) in the organization. FDOT's processes for allocating agency resources, including its consultant programs as well as its Work Program development process, including elements addressing consultant activity, are highlighted in the Best Practices Case Study related to "Program and Resource Plan and Work Program Development".

Using the first (current) year of the Work Program, including the listing of consultant projects, FDOT uses a systematic approach to monitoring the performance of the agency in delivering its Work Program, including consultant assignments.

FDOT uses two reports to track the delivery of the projects and programs identified in the current year of its Five-Year Work Program. One report is referred to as the “Performance Report” and the other is referred to as the “Production Management Report”. They are very similar in content and appearance. The Performance Report is a summary of all projects and project phases that are included in FDOT’s work program on the first day of its fiscal year (July 1). This program is also referred to as the “Lock Down Program”. The Production Management Report includes all of the project and project phases included as of July 1 as well as any program changes (new projects or project phases) that have occurred since the program was adopted on July 1. The Performance Report is what the Agency Plans to do in the coming year and functions as the baseline for measuring agency performance. The Production Management Report includes all projects included in the Performance Report, but also incorporates any unexpected projects such as emergency repairs or special projects.

### **Work Program Monitoring**

FDOT monitors its production, including the completion of its consultant program activities, through both district and statewide Performance Reports and Production Management Reports. Every month, the Central Office Production Management Unit collects information from the districts about the number of projects let and the dollar amounts of those projects. This information is compared with “Locked Down” Program (the program as of July 1<sup>st</sup>) and this comparison is called the Performance Report. The

Performance Report only includes projects listed in the Work Plan. The Production Management Report, which also includes the Performance Reports, includes any additional work (projects and project phases) FDOT has begun work on that was not included in the “Lock Down Program” at the very beginning of FDOT’s fiscal year. The results of this comparison are discussed at a monthly conference call with the districts (usually District Secretaries, the Chief Executives of each District) and Central Office Staff. Minutes of February 2003 Meeting are included in Appendix. The monthly meetings examine the work accomplished and the results of the previous month.

Each district holds a Production Management meeting with district project managers and other key staff members to monitor the progress of district projects and to prepare for the Statewide Performance/Production Management Review. The District Production Management meetings held prior to the review with FDOT’s Executive Management and often involve conference calls to key Central Office units to discuss project issues, especially those which are likely to be raised at the statewide Performance/Production Management review (with the Executive Board).

The statewide review occurs each month at a meeting of the FDOT Executive Board (the Secretary, two Assistant Secretaries, and eight District Secretaries). The purpose of this review is to communicate the agency’s overall delivery of its work program and to highlight areas where actual performance is not consistent with the Performance Plan or Production Management Plan or where there is a discrepancy between the “actual” and “planned” status of the program. Discrepancies are defined as areas where a district indicated it would release a certain project and it was not released or if the estimated consultant contract amount(s) were significantly higher or lower than

the planned amount(s). If there is a discrepancy, the district is responsible for explaining the discrepancy and for detailing any actions being taken to rectify the problem.

This review of each District and Central Office unit's progress in accomplishing the Work Program is openly discussed with other executives and senior managers in attendance. This provides an environment of "friendly competition" among Districts to assure that their program performance is meeting or even exceeding the "Plan". When good performance is occurring, it is an opportunity for the agency's executive managers to publicly acknowledge it. When lackluster performance is occurring within a District or Program Area, it is also discussed which provides ample motivation for future improvement. Each District or Program Area is prepared well in advance of these reviews to respond to questions about program performance.

Currently, in the statewide review session, only the areas where discrepancies from the Plan are indicated are discussed at the meeting. In the past, a detailed review of the Performance Plan or Production Management Report was held with the Executive Board. A new Secretary of Transportation was recently named at FDOT and there is now the possibility that the agency will return to its previous practice of reviewing the reports in more detail (project-by-project).

The district and statewide Performance Report and Production Management Report reviews are usually attended by in-house staff; however, from time to time, visitors are present, such as Florida Transportation Commission (FTC) staff, etc. The material presented at the statewide review is also used at the quarterly meetings of the FTC, an oversight body designed to oversee the performance and administration of FDOT. FTC members are appointed by the Governor. Since most of the projects being

reviewed are consultant projects, the Performance Report and the Production Management Report are actually reporting not only on FDOT's program delivery, but also on how well FDOT is managing its consultant program and whether the consultants are performing their job responsibilities.

If consultants were not performing their job responsibilities, the projects would either begin to fall behind schedule, therefore delaying the release of subsequent contracts, or the Districts or Central Office units would not be reaching their spending targets. Both of these types of incidences are discrepancies that would show up in the Performance Report and attract the attention of the Production Management Unit and senior managers.

FDOT was specifically asked how they handled special types of projects, particularly design-build projects, and also aspects of program management which can be troublesome, such as the number and cost of supplemental agreements for consultant and contractor projects. Florida is tracking the progress of its design-build projects as part of its Production Management and Performance Monitoring system, just as other projects. Supplemental agreements are tracked through the Production Management and Performance Reports and are separately identified. A few years ago, an external organization was concerned about the level of supplemental agreements occurring on FDOT construction projects. As a result, FDOT tracks this separately. According to FDOT's Production Management Office, the number of supplemental agreements varies by district – with some districts having up 40% of their contracts as supplemental agreements with others significantly less. However, supplemental agreements are still

tracked as part of the overall process and their funds and numbers are visible in the Performance Report.

At the end of the year (each June 30<sup>th</sup>), FDOT publishes a year-end account that compares the agency's actual program delivery to the "planned" delivery as it was identified at the beginning of fiscal year. For Fiscal Year 2002/03 (July 1, 2002 – June 30, 2003), FDOT met its program commitments for 396 out of 400 projects. The four projects not accomplished during the year represented only \$94 million out of a total of \$1.5 billion, achieving a 93.74% program delivery level. This annual summary report is provided for use internally by FDOT management, for the Florida Transportation Commission, and for the FDOT Executive Committee.

### **Implementation Process**

FDOT did not have a single implementation program for its Performance Report and Production Management Report process. These reports, or something similar, have been part of FDOT's management for over 20 years. The reports in their current form represent an evolution of a tracking system for specific functions to a statewide program-specific performance tracking system. According to FDOT's Manager of Production Management, currently, the most significant pressure for the performance tracking process comes from the organization itself and the desire to answer the question "are we doing what we said we would and when we said we would do it?"

This interest in communicating whether FDOT has accomplished its Work Program dates back to the early 1990s when the agency suffered a major loss of public confidence. At that time, a major financial crisis occurred and many planned transportation projects were eliminated from FDOT's Work Program or significantly

delayed. Of course, the impacts of this crisis were felt across the state and affected private sector firms, local governments, and State elected officials. In rebounding from this situation, FDOT made major changes to its organizational processes and culture. One of the very positive outcomes from this experience has been the development of transparent planning, programming, and management processes that demonstrate FDOT is accomplishing nearly all of its planned transportation projects during a given year. In recent years, FDOT's record of accomplishment has been in the 95% to 98% range of meeting its planned program commitments statewide. This level of accomplishment is a great source of pride for FDOT management and the agency's employees.

These processes also help FDOT managers answer questions about the agency's use of taxpayer money. Program delivery is also a key component of the Sterling Business Model adopted by FDOT. Therefore, senior managers and employees throughout the organization can recognize the relationship between FDOT's work program delivery, the success of its primary business practices, and credibility in the community at large.

These processes are also important to individuals and organizations outside FDOT. These include:

- State and Local Elected Officials (interested in FDOT's Work Program).
- The construction and consultant interest groups who must gauge their business operations in relationship to FDOT's program.
- Real estate professionals and the economic development community who monitor FDOT's program delivery to learn the type, magnitude, and location of major transportation investments throughout the state.

- Local governments who depend on FDOT projects to help solve transportation problems in their jurisdictions.

The evolutionary process that has molded FDOT's Performance Report and Production Management Report suggests that they have been developed and refined in response to the needs of the department and major stakeholders into what it is today. These reports also create the momentum to maintain a high level of effectiveness in program and project performance throughout the organization, including consultant program activities.

### **Obstacles**

There were no directly stated obstacles to implementation of this report by FDOT officials. The evolutionary nature of the report itself suggests that the report was not coordinated from a top-down approach and therefore developed on an ad hoc basis.

Another interesting and potentially worrisome aspect of the FDOT process is the widespread use and open discussion of the performance data among large groups within the organization. The data used in the Performance Report is public information, available to anyone requesting it. Practically, the performance monitoring information is also available to agency employees interested in the performance of the agency as a whole and individual work units within it. While some professionals may be uncomfortable at first with this type of information being available to employees, others point out that having this knowledge gives the FDOT employees involved in delivering the agency's Work Program a sense of the overall mission of the agency and their important role in helping DOT meet its objectives. In the case of FDOT, these management processes are accepted as "normal and routine" by professionals within the

DOT and an indication that the agency's senior management is aware of individual and work unit performance and actively engaged in monitoring it.

### **Benefits**

FDOT personnel listed many benefits from the program. First, the transparency in the program allows FDOT to know exactly where each project stands that is included in the Performance Report or Production Management Report. This transparency helps improve public support for FDOT, increases public trust in FDOT, and overall makes the agency a better public agency in the view of the staff.

Transparency also benefits the consultant and construction communities by allowing them to plan for the coming year and know what projects are or are not planned for the year. Consulting firms can make decisions about staff expansions or new service areas based on reliable information from FDOT. The report also provides data for the FTC to assess how well FDOT is meeting its programmatic plans.

Additionally, the Performance and Production Management Reports allow the identification of problem projects early so that any potential problems can be quickly identified and overcome before the end of FDOT's fiscal year. Quickly identifying problems and addressing them with effective solutions is good organizational behavior to model.

The benefits from the Performance/Production Management process and reporting system – the ability to track where and when program funds are being committed and if they are being committed according to FDOT's Work Program are perceived by the agency to be critically important. FDOT's Production Management staff is very interested in expanding the performance tracking to grant programs and all other units

within the agency. However, this expansion is limited by availability of funding and training.

### **Lessons Learned**

The evolution of the Performance/Production Management Report at FDOT over time has led to a transparent and self-sustaining system that enables FDOT to more effectively track its projects and the delivery of its overall annual Work Program, including its consultant projects. FDOT's experience with its Production Management and Performance Monitoring process provides several lessons to other DOT organizations:

- A transparent performance tracking system can enhance the agency's public credibility by showing how and where public resources are being spent.
- A realistic vision of the agency's capabilities must be the basis of its performance reporting system (i.e. its adopted Work Program, for example).
- The performance reporting system must be organized so progress can be easily measured.
- The monitoring system must for the early identification of problems to allow the Department to show that if problems arise, they are being addressed. If they are beyond the control of FDOT, those situations are also explained.
- A well designed and accurate reporting system can facilitate an effective partnership with the consultant and contractor communities.
- An effective and transparent reporting system will become self-sustaining and supported by the organization over the long term as a sound management practice.

**BEST PRACTICE CASE STUDY 6: CONSULTANT EVALUATION**

**“Consultant Evaluation System” – Ohio DOT**

## **Introduction**

One of the best practices currently used by the Ohio Department of Transportation is its Consultant Evaluation System (CES). This system was implemented over a multi-year period and is designed to provide feedback to the consultant and help the ODOT evaluate project performance. The need for the evaluation system is part of the overall departmental focus on improving project quality and project performance.<sup>i</sup>

There are several reasons why the ODOT's consultant evaluation procedures are the best example of consultant evaluation by a State Department of Transportation. First, the evaluation process is simple, continuous, and available to all project managers and ODOT personnel throughout the state. The system uses ODOT's intranet and is available on-line to all users. Additionally, the evaluation form itself allows for customization based upon the project type and uses a simplified numbered grading system.

The system also requires a face-to-face meeting with the consultant at the end of the project to review the results of the evaluation. This allows the consultant to be able to ask questions and/or respond to issues raised during the evaluation. The meeting is conducted with several ODOT officials, including the Project Manager, the Contract Manager (from the Consultant Services Office), a senior manager from Central Office or the District, and a representative from the consultant firm. Combining these aspects has produced the desired results – a simple and transparent evaluation system that has resulted in improvements in consultant and ODOT project performance.

## **DOT Background**

The Ohio Department of Transportation (ODOT) is the state agency responsible for constructing and maintaining state owned transportation infrastructure in the State of

Ohio. Based in Columbus, Ohio, ODOT is a 6,300 member organization responsible for around a \$1.15 billion work program annually. Divided into twelve districts, ODOT is a decentralized organization and is responsible for infrastructure in larger urban areas, rural farming communities, small and medium size cities, and Appalachian communities.

ODOT views consultants as necessary extensions of staff that are able to perform the tasks that ODOT cannot perform with in-house staff. By state law, ODOT is limited to 6,300 employees. Additionally, there are some specialty areas where ODOT chooses not to maintain in-house capabilities. For example, ODOT does not maintain the necessary in-house staff to design a cable-stayed bridge. However, that type of knowledge was required to help construct the Maumee River Bridge Crossing in Toledo. Thus, ODOT contracted with a consultant firm to design the bridge. ODOT consultants are viewed as the designers of the infrastructure. ODOT maintains its role as the owner of the infrastructure and makes the appropriate ownership decisions.<sup>ii</sup>

In consultant projects, ODOT has two managers – a Contract Manager (CM) and a Project Manager (PM). The CM is responsible for making sure that all aspects of the contract, including scoping, selection, and negotiations, are complied with and that the consultant delivers the product the contract specifies. The CM also handles all contract modifications. The CM does not have to have an engineering background. The PM is responsible for all the technical aspects of the contract including the review of plans and all day-to-day decision-making for the project. The PM does have to have an engineering or appropriate technical background.

**Detailed Description**

ODOT uses an automated on-line consultant evaluation system to conduct its performance reviews. The system is available to all project managers, Consultant Services Office personnel, and senior management.

At the heart of the evaluation system is the grading. The ODOT Consultant Evaluation System uses a 10-point grading scale with only four numbers or values permitted to be used – 10, 8, 5, and 1. For example, assigning a grade of 6 or 7 for a particular evaluation factor is not permitted. Using this approach, ODOT can assure that its Project Managers are making clear distinctions about consultant performance using only these values.

As stated before, ODOT’s general philosophy is that consultants are viewed as an extension of its in-house staff, yet the grading scale seems to be anchored around the extent to which the ODOT Project Manager must be involved in the project. Table A7-1 illustrates the consultant evaluation values and their definitions. In the view of ODOT’s consultant evaluation system, the highest rated consultants are those who require the least involvement of the ODOT Project Manager. This apparent discrepancy can be explained by thinking of ODOT as the Project Manager with the consultant as the staff. The less the Project Manager has to have a “hands-on” relationship with the staff (the consultant), the more time the ODOT Project Manager can spend on his/her duties. With ODOT Project Managers handling a large number of projects, minimizing ODOT Project Manager time by consultants is strongly desired.

*Table A7-1 – ODOT Consultant Evaluation Values*

<b>Assigned Value</b>	<b>Descriptor</b>	<b>Definition</b>
10	Exceeds	Consultant exceeded the

		requirements and expectations of the Scope of Services
8	Satisfactory	Acceptable work product with minimal involvement by the Department
5	Improvement Required	Consultant's work required substantive comments by the Department
1	Unsatisfactory	Extensive involvement by Department personnel required.

To calculate the final grade, the total number of points earned is divided by the total number of possible points. Only one grade is given at the end of the project with no separate ratings for specific submittals, with the exception of Environmental Agreements which include separate documents that can be reviewed independently such as Section 4(f) Documents, Archaeological Investigations, and Environmental Site Assessments. However, during the course of the project, interim ratings are provided at the submission of major project deliverables.

Once a grade has been determined for a consultant on a particular project, that grade is applied to the firm on a statewide basis. Separate grades for individual offices of a firm are not provided. Additionally, prime consultants are also graded on the performance of their subconsultants. Therefore, if a subconsultant performs poorly, that is reflected in the grade of the prime consultant.

When a consultant agreement is executed by the Department, a set of relevant information is entered into the Consultant Services System (CSS) and is linked to all the information in the Consultant Evaluation System (CES). The CSS is an informational system that provides such information as the consultant's address and location, the type of project, the project number, etc. (see Appendix). Information in the CSS is entered by the Office of Contracts by the Contract Manager for the project.

The CES is the Consultant Evaluation System, the location where ODOT maintains information on consultant performance. More simply put, the CSS provides all the detailed background information about the project while CES houses the consultant evaluation data. The systems are linked by project number. Both systems are maintained by ODOT Central Office Information Technology staff who also provide training on the use of the systems in the central office and in the districts. This information helps generate the Consultant Evaluation System forms. In the CES, there are three rating categories provided for in each consultant evaluation – Management Review, Timeliness Review, and Performance Review.

The Management Review reflects the Department’s desire to have effective and competent project management from the consultant side. The Timeliness Review is based completely on whether the consultant submits the required documents according to an established schedule. The Performance Review is based upon the technical competence of the work and is customized for each project based upon the information entered in the CSS. For example, information is provided for the type of agreement, complexity of the agreement, presence of subconsultants, and location of agreements.

The types of agreements included in the CES are:

- Bridge Inspection
- Construction Inspection
- Design
- Environmental Right of Way Acquisition
- Task Order

If the Department contracts for a service not provided for under the above categories, the agreement is listed as “Other” and does not generate a record within the CES. Opening the CES at the beginning of the contract allows for interim evaluations to

be entered at any time during the project at the ODOT Project Manager's discretion. The system also allows project managers to know not only what agreements have been completed, but also what agreements are on-going. The type of agreement entered in this CSS also determines the categories of major work headings. Work headings are also based upon the complexity of the project within each type of agreement. For example, a Design Agreement usually includes work headings for Work Description, Traffic Control Activity, Bridges, Geotechnical Engineering, Traffic Signals, and Lighting. Under each of these work headings are additional tasks such as the number of bridges and whether these bridges are new or rehabilitated.

The purpose of these questions is to allow the CES to automatically create a customized evaluation form for ODOT for each technical element of the project based on the agreement type. For example, a project having elements, such as roadway design, bridge design, traffic control, and right-of-way plan development, will have a consultant evaluation form customized to include evaluation questions addressing each of these topics. This customized agreement will only include evaluation questions on work headings that are specified as part of the agreement.

Additionally, since all subconsultants are listed and evaluated as part of the agreement, each work heading in the agreement can be listed as the responsibility of one subconsultant. At this time, the CES allows only one subconsultant to be listed for each work type. On larger ODOT projects, there are situations where multiple subconsultants may be performing the same type of work. ODOT is working on improvements to the system to address cases where there are multiple subconsultants working on the same work type within a project.

Once the customized Performance Review evaluation form is developed, it is possible for the ODOT Project Manager, to evaluate the consultant at any time. This allows for on-going evaluation, but each time a new evaluation is entered into the system, the old evaluation is erased. Therefore, if a consultant is evaluated at the beginning of the year and then three months later, only the last evaluation is retained in the CES system. If ODOT modified the system to maintain the old evaluations, a continuous performance monitoring system would be created. Consultant evaluation information is considered extremely useful and influential in helping ODOT make its selection decisions. ODOT is also relying on its consultant evaluations to improve consultant product quality. Therefore, the evaluation system could be perceived as a substitute and/or complement to agency performance monitoring.

ODOT currently requires all Project Managers to identify any consultant performance issues every 90 days. The full CES form is not used for this evaluation. The 90-day review provides an opportunity to for ODOT project managers to identify the performance of the consultant on a continuous basis to senior management. The project managers provide a short description of any performance issues on active projects. Excellent or noteworthy performance is also reported in the system. This information, together with the more formal consultant evaluations of individual projects, is used by ODOT management in its consultant selection deliberations.

After the completion of the project, a final consultant evaluation is conducted and reviewed and approved by ODOT's Project Manager and Contract Manager. Having both approvals enables the evaluation to be more comprehensive and objective. A face-to-face meeting with the consultant firm is held to discuss the results of the final

consultant evaluation. If the results of the evaluation are not satisfactory, one or more senior managers attend the consultant evaluation conference. The purpose of the meeting is to discuss areas and methods for the firm's improvement.

For projects having subsequent right-of-way and construction phases, the ODOT consultant evaluation provides for feedback on both of these phases to the design consultant. Performance in the right-of-way phase is evaluated in the section of the evaluation called "Feedback from the Acquisition Process". If difficulties occurred during the construction phase as a result of design issues, they can be addressed in the section of the evaluation called "Feedback from the Construction Process". The evaluations for these areas are **not** intended to be additional ratings, but are viewed as providing additional information regarding consultant performance. The Feedback from the Acquisition Process is only used for projects requiring right-of-way acquisition and is designed to provide information on whether the documents provided by the consultant for the right-of-way acquisition phase were reasonably accurate and required no substantial reworking by ODOT.

The Feedback from the Construction Process is designed to provide information on whether the consultant provided constructible design plans. Since these are additional pieces of information and not additional ratings, a poor assessment on either of these factors can result in a revision of the final evaluation score to a lower score. If, during the construction process, significant problems are encountered, an additional conference with the consultant is required. The feedback ratings are reviewed by the Contract Manager and the Project Manager. A high score in either of these two areas will not result in a higher overall score for the consultant since ODOT views accurate and

complete right-of-way and construction plans as necessary components of any successful design contract which include these elements.

ODOT has documented its consultant evaluation process in training materials available to both its own in-house staff and consultants.

### **Implementation Process**

According to ODOT officials, the agency's Consultant Evaluation System was developed over a two to three year period. Its development incorporated the input of the agency's Information Technology (IT) Department, ODOT Central Office units, District Offices, and the consultant community. Once the program was developed, it was implemented first in the Central Office and then in the districts. A half-day training session has been developed on the CES and is periodically offered throughout the state. The course is repeated whenever there are significant personnel changes or if a district requests training.

Pressure for creating the new consultant evaluation system came from two sources. First, the current system is the second generation of computerized consultant evaluation utilized by ODOT. The first system was a mainframe based system developed by the Central Office that was cumbersome and outdated. ODOT personnel think the system dated from the 1970s and stated that it was hardly ever used because it was too cumbersome and time consuming.

The second source of pressure for implementing the new consultant evaluation system was the quality improvement initiative begun in the late 1990s by the Director of ODOT, Mr. Gordon Proctor. At his direction, the agency reengineered the plan review process and emphasized quality of products delivered by consultants. In response to this

quality initiative, it became necessary to have an objective way to evaluate consultant technical and management quality. This push led to the creation of the CES system and its widespread use.

### **Obstacles**

The only obstacle in implementing the Consultant Evaluation System was persuading ODOT project managers to use the system and evaluate their consultants. During the first year it was available, few project managers used the system, making it difficult to realize the full benefits of the system. The system is widely used now due to a senior management directive to ODOT project managers.

### **Benefits**

The most commonly stated benefit from the consultant evaluation system is the improved quality of consultant work. This view was stated by District Office personnel, Central Office personnel, and the agency's senior management. However, there were various reasons given for the improvement of consultant performance.

District personnel felt that consultants now understood they were being evaluated on their work and some firms had instituted quality control measures in reaction ODOT's actions. Additionally, because prime consultants are rated also on the performance of their subconsultants, some district personnel think that firms have started paying more attention to the performance of subconsultants and are being more careful in their project teaming. District personnel also stated considering consultant performance as part of the consultant selection process was an important factor in consultant improvement. While consultant performance is only part of the overall selection process, past experience,

defined as the consultant’s evaluation score, can be up 40 points out of 100 points in the selection of a consultant for a particular contract.

Table A7-2 below gives the major categories and points used in the evaluation of consultant technical proposals.

*Table A7-2 – ODOT Consultant Selection Points*

<b>Category</b>	<b>Possible Points</b>
Firm’s Location	5
Project Manager	15
Strength and Experience of Assigned Staff including Subconsultants	25
Minority Business Enterprise (MBE) / Disadvantaged Business Enterprise (DBE) Participation	5
Consultant’s Past Performance	40
Present Workload with ODOT	10
<b>Total Points</b>	<b>100</b>

Looking Table A7-2, ODOT attempts to avoid having just a few large firms doing all their work by including a category for “Present Workload with ODOT.” The more work a firm current has with ODOT, the fewer points it receives in this category.

Central Office managers also expressed the view that with all districts in the state having access to the consultant evaluation system, it gave District Office personnel a better tool for making recommendations for the selection of consultants based on the technical quality of their work.

Although a firm might be new to one particular district, it was possible to look at the firm’s consultant performance in other similar projects in other districts. This added resource helps the district managers and staff focus on technical quality in their consultant selection recommendations.

The main benefit from the consultant evaluation system has been an improvement in the quality of work received from consultants. The agency also believes it benefits from having consultant performance data to use in its consultant selection activities.

### **Lessons Learned**

Major lessons learned as part of the development of ODOT's Consultant Evaluation System are:

- An objective, fair evaluation system that is widely used by DOT managers will improve the quality of work received from consultants.
- Involvement of all affected parties in the development of the evaluation system is important to obtaining a fair and objective evaluation system.
- Providing effective training to DOT Project Managers, Contract Managers, and consultants on how the consultant evaluations should be handled is important to the success of the system.
- Senior management must actively encourage the use of the system so all project managers conduct the consultant evaluations.
- ODOT reports that the use of consultant performance data in the consultant selection process is very effective.

### **Other Related Practices**

Many other State DOTs utilize processes for evaluating their consultants, although the organization of the process and evaluation criteria differ from state to state. In addition to the Ohio system, two other states are highlighted as part of the Best Practices activities.

The Florida DOT uses a similar process and evaluation form structure to Ohio's system; however, its evaluation form is not electronically generated and customized to the nature of the project. FDOT evaluates its non-construction engineering inspection (CEI) consultants on (1) Schedule; (2) Management; (3) Quality; and (4) Constructability. FDOT evaluates its CEI consultants on (1) Personnel; (2) Reports and Records; (3) Inspection; (4) Field Services and Equipment; (5) Contract Documents; (6) Changes; (7) Compliance with DBE and EEO; (8) Final Estimates and (9) Payments.

The North Carolina DOT uses a consultant evaluation process that is simpler in structure. It uses a five-point system and evaluates consultants on (1) Responsiveness; (2) Accuracy; (3) Cooperation; (4) Schedule; (5) Independence; and (7) Presentation. NCDOT assesses performance using qualitative measures of "Outstanding", "Above Good", "Good", "Below Good", and "Unsatisfactory". NCDOT provides grades annually for each project and at the completion of the project.

## **BEST PRACTICE CASE STUDY 7: CONSULTANT AUDITS**

### **"Consultant Audits: The Pre-Award and Post Auditing Practices"**

## **Florida DOT and PennDOT**

### **Introduction**

This case examines different practices used by the Florida DOT and PennDOT at various points in the development and management of consultant contracts. It should be noted that an extensive analysis of consultant auditing practices was conducted by the North Highland Group (NHG) and has been documented in a separate report. This case draws upon the data and information collected from the NHG effort as well as other information gathered from the project team. The practices examined in this case study focus on the pre-award and final audit activities since these are of great interest to GDOT.

Florida DOT (FDOT)'s External Audit group resides in its Office of the Inspector General (OIG). The OIG External Audit group's responsibilities include:

- Conducting audits of external organizations receiving funds from FDOT.
- Initiating, conducting, supervising and coordinating investigations designed to detect, deter, prevent and eradicate fraud, waste, mismanagement, misconduct and other abuses.
- Recommending corrective action concerning fraud, abuses, and deficiencies.
- Reporting on the progress made in implementing corrective action.

The Pennsylvania Department of Transportation's (PennDOT) External Audit group resides in its Office of the Comptroller, Bureau of Audits. This group performs financial audits, financial-related audits, financial compliance audits, and technical reviews of audit reports prepared by other organizations that receive funds from the Department.

Although each DOT placed their audits division in a different structural setting than the other, their mandates are similar: to ensure that organizations receiving funds from the Department are doing so in accordance with Federal and state statutes and are not participating in fraudulent activities.

**State DOT Auditing Methodologies**

External Audit groups have many steps in the contractual process in which to initiate an audit. These opportunities are detailed in Table A8-1 below.

*Table A8-1: Major Consultant Contract Phases*

Contract Development	Contract Management	Contract Closeout
Pre-Award Review*	Interim Audit	Final Audit

*\*Most DOT Audit Units require established audited overhead rates for Pre-Award Review*

***Pre-Award Audits***

FDOT and PennDOT have shifted away from mandatory pre-award reviews on new contracts. In addition to materiality, FDOT reviews a sampling of contracts between \$500,000 and \$2,000,000 and all contracts exceeding \$2,000,000. FDOT, however, can and does use materiality to determine which contracts need to be subjected to Pre-award review. The Procurement Office sees auditing contracts less than \$500,000 as providing little value and tends to shift their resources to performing additional final audits.

When pre-award reviews do take place they typically take between three to five days to complete. FDOT’s cycle times are so short on these audits because tasks other states assign to the pre-Award review are done in earlier stages in the FDOT process. Both the accounting system review and overhead rates verification are done as part of FDOT’s administrative prequalification procedures.

PennDOT uses a more informal process for its pre-award reviews. This review takes place during their contract negotiations with the consulting firm once they have been selected for a project. The negotiating engineer reviews the hours identified in the cost proposal based on the firm's technical qualifications and in-house estimates. The PennDOT audit group then reviews the indirect and overhead cost rates for reasonableness. This audit review also has a short cycle time because PennDOT requires firms winning more than \$250,000 per year in contracts to have an annual CPA audited overhead rate. PennDOT utilizes a consultant liaison to work with the consultants to help clarify any issues with the indirect costs rates.

### ***Interim Audits***

FDOT uses interim audits only on projects that have a multi-year duration, including longer contracts involving the design and construction of a highway. These contracts are typically design contracts which are kept active for 10 years or more in case there are design issues during the construction phase of the project that need to be corrected by the designer. PennDOT has no formal Interim Audit process, but does require all consultants to prepare a comprehensive status report when the contract is at 75% completion. This report is designed to ensure that the project is on schedule and on budget.

### ***Final Audits***

FDOT was the only state where a site visit was conducted that has a formalized Final Audit process. FDOT performs final audits on a sampling basis, with the intention of focusing on projects with large contract amounts. This strategy of random sampling is meant to serve as a tool to maintain the integrity of the contracting and invoicing

processes and as a deterrent to fraud. The FDOT Audit group felt that this been effective in their attempts to curb fraud.

PennDOT has a process similar to a final audit called a “Contract Audit.” These audits are selected using risk-based analysis, with factors including firm familiarity with PennDOT and firms with larger dollar contracts. This audit is performed on-site and incorporates a review of all open contracts with a particular consultant. The audit group will review both the incurred costs and the overhead rate, and based on their findings will adjust billings.

### **Lessons Learned**

The most notable finding from the state DOT auditing practices was their different approach to pre-award reviews. The reduction in turnaround times on these reviews can be attributed to the shifting the reviews of overhead rates and accounting systems to other steps in the process. Both FDOT and PennDOT utilized CPA overhead audits for all consultants and subconsultants who have more than \$250,000 per year in contracts. The outsourcing of this overhead function allows the audit staff to refocus their efforts on their other processes. FDOT uses these resources to focus on final audits. PennDOT uses the resources to focus on Contract Audits. Both DOT Audit groups felt that these closeout audits were a more effective method of deterrence and more effective use of their resources than focusing on pre-award reviews.

**APPENDIX A:**

**Contact Information for State DOT Participants**

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## **APPENDIX B:**

### **Best Practice Cases – Prequalification Telephone Interview Form (Script)**

Good (morning, afternoon), my name is \_\_\_\_\_ and I am working with GA Tech. We are working on a research project for the Georgia Department of Transportation on how state DOTs manage their consultant programs. Your organization was chosen because GDOT's senior management has heard some very positive things about how you manage your consultants. They have asked us to follow up and talk with you about it.

In particular, we are interested in hearing more about your \_\_\_\_\_ (best practice topic area, tool, or strategy, etc.).

We hope we can talk with you for a few minutes today and possibly make arrangements to come and visit with your agency to collect more detailed information. Are you the right person to speak with about consultant management activities in your DOT? (if yes, proceed; if no, get name/contact information for appropriate person).

We have a short list of questions – it should take about 20 minutes to complete. Is this a good time for you to talk or should we arrange another time to talk? (if OK, proceed; if not OK, set up a time certain as soon as possible and leave a name and phone number for them to reach the Georgia Tech team if they have questions).

#### **Questions:**

This set of questions relates to the overall process you use for managing consultants, which work units are responsible for which activities, and where consultant services are currently being used in your organization.

1. Can you generally describe your consultant management process?

2. Which work units have specific responsibilities for consultant management?

What aspects of consultant management are they responsible for? (prompts: make sure they mention the consultant audit activities, etc.).

3. Do you use consultants in most of the work units in your DOT or only in certain units? Which ones are using consultants? (prompt: do you know what percentage of your agency's budget is tied to consultant activities?).

4. Do you think the level of consultant services in your agency will expand, stay the same or shrink in the next few years?

This set of questions has to do with how your consultant management program deals with consultant audits and overall compliance with federal regulations.

5. How does your state handle the consultant pre-award and post-audit functions?
6. Do you think your current process of handling consultant audits is working well? Why or why not? (prompt: has any internal or external review of the consultant audit function shown any problem areas?)
7. How do you go about making sure your process complies with the federal and state contract acquisition and audit regulations? (prompt: did you design your program to comply with FAR, TAR, other state laws, etc.)

This set of questions has to do with how well your agency thinks its consultant management activities are working.

8. How would your agency evaluate its success with its consultant management program (very good, pretty good, not so good)?

9. Are there specific practices or tools used in your consultant management activities that you consider especially effective for getting good results? If so, what are they?

Thank you very much for helping us out with these questions. I mentioned before that we might want to follow up with your organization and possibly schedule a visit. Are you the person we would talk with to arrange this? Thank you so much for helping us.

Here is our contact information in case you have any questions or would like to talk with us.

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**APPENDIX C:**

**Best Practice Case Studies – Site Visit Interview Protocol**

General Process	102
Training/Project Manager Development	152
Partnering/Relationship-Building	154
Evaluation	156
Scoping/Negotiation/Performance Management	158
Automation/Technology	160
Compliance – Process	161
Compliance – Audit	167

## GENERAL PROCESS

**Detailed questions of state DOT's General Process:** *This set of questions will be asked of the core group for each participating state during the kick-off session. These questions are intended to help validate and deepen understanding of the current process as well as define characteristics that differentiate the states.*

1. Describe DOT's overall philosophy with respect to using consultants.
2. Describe the strategic environment that DOT operates within and how it influences how you use consultants (political expectations, legal environment, institutional capabilities, etc.)? What constraints are present (laws, etc.)?
3. Confirm high level process understanding from the phone interview.
4. How long does it generally take (in days) from the time a consultant project is advertised until the Notice to Proceed is issued? Who generates the advertisement?
5. Does the DOT have a management information system that tracks the status (contract status, signature) of all consultant projects?
6. What is your overall level of consultant activity (no. of consultant contracts and/or dollar amount of contracts)? Has the level of contracting changed over the past five years? Is the consultant activity expected to grow or not? Why?
7. How does your agency go about determining which functions or projects to keep in-house and which should be contracted out? Are there any specific functions/roles that your agency would NOT consider utilizing consultants? What controls are used to ensure consulting dollars are spent on high priority projects?

8. How does the process differ between acquiring consultants for engineering services versus other professional services? Why do you have different processes? Are different contract types used? What are the benefits from using this approach? Any challenges?
9. Are all consultants pre-qualified by your agency? If not, how do you define who needs to be pre-qualified and who does not need to be pre-qualified?
10. What does the pre-qualification process include e.g. review of qualifications? review of business stability? review of accounting system and controls? Who provides input on the pre-qualification? Does the unit that handles audits get involved in the pre-qualification process? How? [i.e. accounting system review, going concern review, financial capability validation?]
11. Have there been efforts to automate the pre-qualification process? Describe the system used and the functionality it offers.
12. How long does the pre-qualification last before it must be renewed?
13. Are there any changes in the selection procedure anticipated in the near future?
14. What factors does the DOT consider most important in selecting its consultants?
15. What factors does the DOT consider most important in operating its consultant selection process (distribution of work, efficiency, familiarity with firms, etc.)?
16. What mechanisms are used to give advance notice of upcoming projects to the consultant community?
17. Describe the sign off procedure and work flow for contract signing. How long does it take?
18. Who has legal authority for compliance in the contract?

19. What steps (or steps in past procedures) of the consultant acquisition process cause frustration and/or delays? Please describe the issues.
20. How does the DOT interact with subconsultants on a consultant project?
21. Does each office or division use the same procedures in acquiring its consultants? How do you maintain consistency? Is the process for maintaining consistency effective?
22. How does the DOT work to distribute its consultant work among firms? Is there a specific law or DOT policy that requires this?
23. How large a group of consultant firms does the DOT actively contract with?
24. How has the number of firms you actively contract with changed over time?
25. If requested, do you provide a debriefing with a consultant if they are not selected for a project? If so, how and when is this done? Are there any limitations on the debriefings?
26. Do DOT project managers have difficulties differentiating between firms in order to make selection recommendations? Why or why not?

#### **TRAINING/PROJECT MANAGER DEVELOPMENT**

**Detailed questions for the “Training/Project Manager Development” Best Practice Case:** *This set of questions relates to the agency’s efforts to enhance the technical and managerial capabilities of its project managers.*

1. How do you define “Project Manager” in your organization? What knowledge, skills, and abilities (KSAs) does your agency require for project managers? What are the roles and responsibilities of the project managers? How many projects do they typically manage at one time?

2. Does your organization have a specified career path for project managers? What are the job classifications and general pay ranges for project managers? What is the normal career path and years of experience needed for a DOT project manager who manages consultants?
3. Does the DOT train its project managers to manage consultants? How?
4. Does your organization train consultants? Why or why not?
5. Do you believe DOT's project managers are adequately trained on the "business" side of their jobs, i.e. performing consultant scoping, management, approving invoices, considering supplemental agreements, etc.?
6. Has DOT had a significant problem with consultants not having sufficient capabilities or training to handle DOT projects?
7. Is your agency experiencing difficulties in either retaining or recruiting project managers? Why or why not? (pay issues, career path?)
8. Is your agency experiencing difficulties in retaining or recruiting other staff who are needed for consultant activities, such as auditors, contract specialists, negotiators, etc.? If so, why?
9. How does your organization assure that its PMs have the appropriate capabilities to manage consultant projects?
10. Are the benefits to utilizing consulting firms who have former DOT employees on staff or assigned to the project? What are they? How does this influence the selection decision?
11. Do you believe the consultants you work with have the necessary capabilities to perform the work according to DOT's expectations?

12. Do the DOT project managers have sufficient experience to make judgments on consultant ideas or proposals or do they have to rely heavily on DOT directives and manuals?
13. Is the DOT concerned about the agency losing its institutional knowledge due to retirement and downsizing?
14. What impacts are the retirements and downsizing having on your younger project managers?
15. How high is the priority of Project Manager development and training with DOT senior management?

#### **PARTNERING/RELATIONSHIP-BUILDING**

##### **Detailed questions for the “Partnering/Relationship-Building” Best Practice**

**Case:** *This set of questions pertains to the activities between DOT and external group(s) which represent consultants or whose members may be consultants.*

1. In your opinion, does DOT have a good relationship with the consultant industry? How would you describe the nature of your relationship with the consultant community? Partners? Extension of DOT staff? Considered hired hands? Consultants are one of many interest groups? Other descriptions?
2. What is the ideal relationship between your organization and the consultant community? Why?
3. What does the term “partnering” mean to your organization?
4. What specific actions does DOT take to establish its desired relationship with its consultants? Are there any specific in-house activities it undertakes to

- accomplish this? Are there any other activities you participate in with the specific purpose of working on the DOT/consultant relationship?
5. Does your senior management spend time interacting with the consultant community? When do these interactions occur?
  6. Do you encourage your project managers to spend time interacting with consultants? Why? How is this usually done?
  7. Do you think the consultant community does the right things to create a positive relationship with DOT? If so, what are they?
  8. Do you think most of the consultants, on an individual basis, do the right things to create a positive relationship with DOT? If so, what are these things?
  9. Do you believe the consultant community in your state understands and cares about DOT's overall mission and goals? Why or why not?
  10. To what extent do you believe consultants get selected because of their capabilities?
  11. To what extent do you think consultants get selected because of their relationships with DOT management and staff?
  12. To what extent do you think consultants get selected because of their political relationships outside DOT?
  13. Which external organizations participate in the DOT-consultant partnering activities? Specifically, how do these organizations interact with DOT?
  14. How long has the DOT been involved in partnering activities with the consultant industry?
  15. Are you planning any future partnering activities with the consultant industry?

16. Do your partnering activities involve construction contractors?
17. Do you believe DOT's project managers are "too friendly" with consultants?  
Why or why not? How are you addressing this?
18. Do you think there is an attitude of mutual trust between DOT and its consultants?  
Why or why not?
19. What changes do you think need to be made to create and maintain the most effective relationship between DOT and the consultant industry?

*The following questions pertain to the DOT's efforts to improve **internal** relationships between DOT work units.*

20. Are there mechanism(s) within your organization that are focused on encouraging internal cooperation and communication between divisions, districts, and/or work units? How do these mechanisms work?
21. Did your organization formally identify the improvement of relations between work units as a primary agency objective? Why was this done? Has this affected the consultant management activities within DOT?
22. What actions did the agency take to address this issue? How long has the agency been working on these internal relationships?
23. Do any DOT staff members receive formal training in partnering/relationship-building? How? Where?

## **EVALUATION**

**Detailed questions for the "Evaluation" Best Practice Case:** *This set of questions relates to the agency's efforts to conduct evaluations of consultant*

*performance, its efforts to utilize this information to the agency's benefit, and its efforts to improve the performance of consultants:*

1. Does the DOT use a formal consultant evaluation process? How long has it been in place?
2. What specific areas of consultant performance are evaluated?
3. Do you believe it is appropriate for DOT to provide feedback to consultants on how to do things the "DOT" way? Why or why not? If so, how is this done?
4. Are the DOT project managers open to ideas or suggestions from consultants on other ways to do things (versus the DOT way)?
5. Do you believe consultants do a good job of checking their work and doing the necessary quality control on their projects?
6. In the DOT's consultant process, is the consultant permitted to comment on the formal evaluation?
7. Is there a face-to-face meeting when the consultant's performance is discussed with DOT management or staff?
8. Does the evaluation process provide an expectation or requirement for the consultant to address the deficiencies identified in the evaluation? How is this expectation met?
9. Are data and information from consultant evaluations used by DOT in its decision-making? How?
10. Has the consultant community ever objected to aspects of the evaluation process? If so, which ones? Why did they object?

11. Do you believe DOT's consultant evaluation process is causing positive behavior changes from the consultants?
12. Are you considering changes to your consultant evaluation process in the near future? If so, what are they? Why are the changes being implemented?
13. Who has access to consultant evaluation data?
14. Do you train DOT personnel on how to evaluate consultants? How?
15. Do you think your project managers believe the consultant evaluation process is effective?
16. Does DOT have any difficulties with "legacy" consultants (i.e. consultants hired several times over a long period of time or hired many years ago)?
17. Do you receive requests from other state DOTs or other transportation agencies for consultant recommendations? How do you handle these?
18. Can we obtain a copy of the consultant evaluation forms and/or description of your procedure for evaluating consultants?

#### SCOPING/NEGOTIATION/PERFORMANCE MANAGEMENT

##### **Detailed questions for the "Scoping/Negotiation/Performance Management"**

**Best Practice Case:** *This set of questions relates to the agency's efforts to (1) expedite the development of project scopes of work and contracts (2) its efforts to conduct fair and efficient negotiations (3) expedite project delivery or make better use of consultant resources to benefit the public and (4) use information systems to monitor its own performance in conducting consultant management activities.*

1. Does the DOT use a process to "standardize" consultant rates or proposed hours for a project?

2. Does the DOT centralize its advertisements/solicitations for consultant projects?  
Why or why not?
3. Does the DOT centralize its contract negotiations? Why or why not?
4. Does the DOT centralize its contract-writing activities? Why or why not?
5. Does the DOT have “contracting officer(s)”? If so, in which office/division are they assigned? What are their responsibilities?
6. Is the DOT satisfied with how long consultant negotiations take? Why or why not?
7. Has the DOT implemented any specific directives or policies aimed at shortening or expediting consultant negotiations?
8. How does the DOT handle task order contracts? At the inception of a task are there additional negotiations? What controls are in place to ensure no abuse takes place under this contract type?
9. What is the level of supplemental consultant agreements occurring now? Is the level increasing, decreasing, or staying the same?
10. Does the DOT have performance measures relating to its consultant processes? If so, what are the most important measures you rely on (top three)? Why are they so important?
11. How were the performance measures developed? Are they used agency wide?
12. Who tracks the performance data over time? Why?
13. How is the information used?
14. Are performance measures resulting in benefits to the DOT?

## AUTOMATION/TECHNOLOGY

### **Detailed questions for the “Automation/Technology” Best Practice Case:**

*This set of questions investigates the agencies efforts at automating work processes through the use of technology.*

1. Does the DOT have a management information system that tracks the duration of each step in the contracting process? If so, describe the measures produced by the system? Who utilizes the data?
2. Are there other initiatives that have been taken or underway to improve the management information systems associated with consultant contracting? If so, what are they?
3. Where these actions taken using in-house capabilities, consultants, or a combination?
4. What was the general process used to introduce and develop these systems?
5. What were the primary motivating factors for implementing these systems?
6. Did you consolidate your management information systems for consultants with your systems for construction contractors? Why or why not?
7. Does the DOT have a formal system for monitoring consultant deliverables or key milestones? If so, what are its capabilities?
8. Does the DOT have a management information system that tracks supplemental consultant agreements? Cost overruns?
9. How is the DOT using the information from these systems for its decision-making?

10. What specific benefits (time savings, dollar savings, etc.) are accruing to the agency from these systems? Have these been quantified?
11. What other partners or stakeholders have participated in these initiatives?
12. What level of funding was needed to implement the program(s)?
13. Is continued funding needed to support the systems? If so, how much?
14. What were some of the implementation challenges? How were these challenges overcome?

#### COMPLIANCE – CONSULTANT MANAGEMENT PROCESS

**Detailed questions for the “Compliance – Process” Best Practice Case:** *This set of questions studies the agency’s efforts to create a consultant management process that is in compliance with both federal and state regulations and at the same time being efficient and effective.*

1. Please give us your definition of a consultant.
2. Describe the process used to ensure your DOT consultant management process is in compliance with Federal and State statutes.
3. What is the process for addressing compliance problems or concerns e.g. procedures that are not in compliance, suspected fraud, lack of disclosure?
4. How does the DOT ensure consistency and compliance of decentralized processes? Do you find these processes more difficult to keep in line than centralized processes? Why or why not?
5. Describe recent efforts to make the consultant management process more efficient while still being in compliance with statutes.

6. Did your agency utilize the knowledge and experience of external consultants to create a compliant set of procedures? Internal staff? Other persons? Are there any compliance experts you might recommend we talk to?
7. When was the last external review of your consultant management process? What were the most significant findings?
8. Were there any findings of a compliance review within the past 10 years that shaped current policy?
9. Have you identified functions or activities in the consultant management process that must be performed by different people to maintain the integrity of the process? (segregation of duties) Describe the various roles and issues or concerns they were designed to address.
10. Have you applied for class exemptions from particular statutes? Which ones have you applied for? What impact has this had on your organization?

*At this point, the project team will walk through questions that address each part of the consultant management process.*

***Pre-Qualification*** – *How do you determine a firm is eligible to bid on a project?*

11. Why do you have a pre-qualification process?
12. Do all professional services consultants have to go through pre-qualifications? If not, how do you define who needs to be pre-qualified and who does not need to be pre-qualified?
13. What does the pre-qualification process include e.g. review of qualifications? review of business stability? review of accounting system and controls? Who provides input on the pre-qualification?

14. How long does the pre-qualification last before the consultant must apply for a renewal? Is there an expedited process for repeat applicants?
15. If you were to choose something about the pre-qualification process to improve what would it be? Describe the change and the desired associated benefits?
16. What is the most effective aspect of your current pre-qualification process?
17. How long does the pre-qualification process typically take to complete? What causes major delays? How do you expedite the process?

***Sourcing*** – *How are needs for “consultants” identified, prioritized and approved.*

18. Who initiates the need for a consultant project? How often are advertisements made for consultant projects (as needed, monthly, quarterly)?
19. Does the sourcing process differ depending upon the functional area identifying the need? How?
20. Which functional process is the most effective? Why? Are there reasons why that process has not been more broadly applied?
21. Who is involved in approving sourcing decisions? What criteria are used to decide who needs to be involved e.g. materiality, risk?
22. If you were to choose something about the sourcing process to improve what would it be? Describe the change and the desired associated benefits.
23. What is the most effective aspect of your current sourcing process?
24. How long does the sourcing process typically take to complete? What causes major delays? How do you expedite the process?
25. What types of sourcing decisions fall out of the normal sourcing process? How are they handled? Why?

***Consultant Selection – How are consultants selected?***

26. Confirm our high level understanding and fill in any gaps.
27. Who is involved in the selection decision?
28. What controls are in place to ensure impartial, fair and objective decisions?
29. What are the biggest challenges you face to keep the process in compliance with statutes? What do you do to address the challenges? Is it effective?
30. If you were to choose something about the selection process to improve what would it be? Describe the change and the desired associated benefits?
31. What is the most effective aspect of your current selection process?
32. How long does the selection process typically take to complete? What causes major delays? How do you expedite the process?
33. What types of selection decisions fall out of the normal sourcing process? How are they handled? Why?

***Contract Development – How are contracts negotiated and approved?***

34. Are different contract types used for different types of professional services? Why?
35. Who in your DOT is considered the Contracting Officer?
36. What are the biggest challenges you face to keep the process in compliance with statutes? What do you do to address the challenges? Is it effective?
37. Who is responsible for negotiating contracts? Are the contracts reviewed by the audit function to ensure appropriate overhead and labor rates were applied?
38. Describe the involvement of your legal function in the negotiating process. How do they ensure the appropriate clauses are included in the contracts.

39. If you were to choose something about the contract development process to improve what would it be? Describe the change and the desired associated benefits?
40. What is the most effective aspect of your current contract development process?
41. How long does the contract development process typically take to complete? What causes major delays? How do you expedite the process?
42. What types of contract development decisions fall out of the normal sourcing process? How are they handled? Why?

***Contract Management – How are consultants managed?***

43. How does your organization ensure the work promised in a contract is delivered? Who is ultimately responsible for completion of the contract? What is their typical training?
44. How does your organization initiate work assigned with a Task Order contract?
45. Describe your organization's use of advance agreements? What benefits have you observed through their use?
46. Who approves consultant invoices for payment? How long does the process typically take from receipt, to approval, to payment?
47. What kind of reporting is required by your agency (DBE, performance reporting)? Who is responsible for this reporting?
48. What are the biggest challenges you face to keep the process in compliance with statutes? What do you do to address the challenges? Is it effective?

49. If you were to choose something about the contract management process to improve what would it be? Describe the change and the desired associated benefits?
50. What is the most effective aspect of your current contract management process?
51. What types of contracts are managed differently from the typical process? How are they handled? Why?

***Contract Closeout– How are contracts closed?***

52. What is the trigger to begin the contract closeout process? What are the procedures used to close out a contract? How soon after the completion of work does the DOT try to close contracts?
53. How is audits notified that a consultant contract should receive a final audit? If an adjustment is required by audit, who is responsible?
54. Who is responsible for completing the performance review? What factors are accounted for in the performance review? Are sub-contractors accounted for in the review as well.
55. How long after completion of the work is a final review performed? Is the information from this review used in other processes?
56. What are the biggest challenges you face to keep the process in compliance with statutes? What do you do to address the challenges? Is it effective?
57. If you were to choose something about the contract closeout process to improve what would it be? Describe the change and the desired associated benefits?
58. What is the most effective aspect of your current contract closeout process?

59. How long does the contract closeout process typically take to complete? What causes major delays? How do you expedite the process?
60. What types of contracts are close outside of the normal process? How are they handled? Why?

***Audit Steps**– How does the audit function interact with the consultant management process?*

61. What points in the process require input from the audit group? How long do their roles typically task to complete? Are they a bottleneck at any stage? If so, why?
62. If you were to choose something to improve the way audits works with consultants, what would it be? Describe the change and the desired associated benefits?
63. What is the most effective aspect of the interaction between audits and consultants?
64. What types of audit procedures fall out of the normal sourcing process? How are they handled? Why?

#### **COMPLIANCE – CONSULTANT AUDIT PROCESS**

**Detailed questions for the “Compliance – Audit” Best Practice Case:** *This set of questions studies the agency’s efforts to create consultant audit processes that are in compliance with both federal and state regulations and at the same time being efficient and effective.*

1. Does the audit group review the consultant management process as well as the consultants?

2. Describe in your own words the primary objectives and responsibilities of the audit group with respect to consultant management?
3. Who has the ultimate responsibility for making sure consultant contracts are in compliance with statutes?
4. Describe the process used to design consultant management and consultant audit processes that comply with Federal and State statutes?
5. Describe the statutes which you believe are the most difficult to comply with. Explain the nature of the problem and how you resolve it.
6. Did the audit groups within the DOT have to overcome perceptions that caused unresponsiveness? How have you worked to have the appropriate amount of influence within the organization?

***Audit of the Consultant Management Process***

7. Describe the process used to verify that DOT personnel follow prescribed contract management policies and procedures. How is it determined (trigger / frequency) that an audit is needed for: (a) the contract management process or (b) a portion of the contract management process?
8. To whom are audit findings reported?
9. How are they resolved?
10. How would you like to strengthen / improve the process?

***Fraud***

11. Describe the most effective controls you have in place to prevent fraud? Why are they effective?

12. Describe the most effective mechanism you have for detecting fraud. If fraud is detected, what procedures do you follow to:
  - a. Address and stop the activity
  - b. Report the problem
  - c. Prevent a re-occurrence

***Governance***

13. What processes are in place to make sure that audit findings are resolved?
14. Describe the audits groups reporting relationship(s).
15. What would you change to increase the effectiveness and independence of the audit group?
16. Describe how disputes between contract management and audit are resolved. Who has the power to make the final decision on what is included in a contract? Is the dispute resolution an effective process? What could / should be done to improve the process?

***Consultant Audits***

17. Describe the primary types of audits used to review the consultants at various stages throughout the consultant management process?
  - a. Pre-Qualification
  - b. Pre-Award Review (Cost Proposal, Adequacy of systems)
  - c. Overhead Audits
  - d. Interim Audits
  - e. Final Audit
  - f. Other
18. For each audit type:
  - a. Describe the objective
  - b. Describe the trigger
  - c. Frequency of the audit
  - d. Are all contracts subject to the audit or only a subset
  - e. Describe the most significant issues that tend to arise on this audit

- f. The process for resolving the issues or disputes
  - g. What should be done or has been done to improve the efficiency and effectiveness of the audit? Why and how?
  - h. What are your most significant concerns and what are you're your thoughts on how they should be addressed
19. For direct costs, do you allow large items such as vehicles to be charged to the DOT? What controls are in place to make sure the costs are justified? What controls are in place to prevent double charging (Same item in direct and indirect charges)? Are the controls capable of handling the use of sub-consultants?
20. Are grants a source of funding for the DOT. Are the contracts associated with grants (or other funding sources besides federal dollars) subject to a different level of scrutiny than contracts associated with Federal funding?
21. Have you applied for class exemptions from particular statutes? Which ones have you applied for? What impact has this had on your organization?
22. Have you identified functions or activities in the consultant management process that must be performed by different people to maintain the integrity of the process? (segregation of duties) Describe the various roles and issues or concerns they were designed to address.
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