Overview Of WSDOT Capital Project Management

Conducted for the Transportation Performance Audit Board

Funded by the Legislative Transportation Committee

Report 05-3

Report Digest

January 21, 2005

State of Washington

Joint Legislative Audit and Review Committee

Study Team

Keenan Konopaski

Legislative Auditor

Cindi Yates

Copies of Final reports and Digests are available on the JLARC website at:

http://jlarc.leg.wa.gov

or contact

Joint Legislative Audit & Review Committee
506 16th Avenue SE
Olympia, WA 98501-2323
(360) 786-5171
(360) 786-5180 FAX

Study Mandate

The Transportation Performance Audit Board (TPAB) assigned this overview to the Joint Legislative Audit and Review Committee (JLARC). The review emphasizes critical path management, risk management, project reporting, and organizational structures used to execute capital projects.

Study Approach

Since the study was intended to be a pre-audit review, JLARC did not assess all projects at WSDOT. JLARC selected eight example projects, intended to represent the diversity of issues and characteristics in WSDOT's capital program. JLARC solicited an engineering consultant to assist with the example project reviews. The review focused primarily on the specific methods used to manage the eight example projects.

Overview of Procedures, Organization, and Systems

Management of a capital program involves three components, linked in a cyclical fashion: planning and program development, authorization and funding, and project delivery. This report focuses on project delivery.

While there is wide variation in the type and scope of capital projects, there are certain high-level tasks in common. Notably, WSDOT (a) designs the project, (b) works with regulatory agencies, property owners, and governments/utilities to secure permits, acquire necessary right-of-way, coordinate local infrastructure/utility displacement, and (c) hires construction contractors to build roads and structures.

The management of project delivery is decentralized to managers in WSDOT's geographical highway regions and other modes, and the organization for project delivery within each region or mode varies. Headquarters staff generally provide standards, direction, tools, approvals, and technical assistance. Executive management provides oversight and approves changes to the scope, schedule and budget of projects.

WSDOT has implemented a number of initiatives intended to enhance project delivery. These include establishing principles for project management standards, developing advanced risk management techniques, modifying executive oversight processes, developing project management information systems, establishing centralized project reporting and control, and sharing information on innovative techniques.

WSDOT has a number of automated information technology systems that support the delivery of capital projects. These systems operate in silo environments, and don't easily interface to share project management information. Further, data sharing limits constrain the ability to perform analysis and inhibit the efficiency and accuracy of project reporting.

Observations on Cost and Schedule Increases

WSDOT appears to have reduced the amount construction costs at close-out have increased above initial contract awards, and limited avoidable change orders that do not add value to projects. Schedule increases above the working days bid in construction contracts are higher than prior audits, but still below comparable levels previously identified at other states.

Findings from Project Reviews

- WSDOT staff have knowledge of the issues that can impact their project schedules, but there is wide diversity in the knowledge and application of critical path management techniques across WSDOT projects.
- Project engineers generally utilize schedules that are comprehensive and measurable. However, multiple staff may be responsible for segments or phases of a project. As a result, schedules are often segmented as well.
- Projects that utilize the Department's advanced software tools yield superior critical path management practices.
- WSDOT generally delegates the management of critical path to contractors when projects enter the construction phase, but several project engineers recognized the importance of additional schedule requirements for larger projects involving more risks.
- WSDOT has training available to address the theory and practice of critical path and scheduling management and has been increasing the number of staff trained.
- Project engineers are universally aware of project risks, but generally use informal methods to manage, mitigate or avoid them.
- There are some advanced methods of risk management being utilized at WSDOT; however, these methods are not widespread. WSDOT can benefit from more universal application of risk quantification on all projects.
- WSDOT has a strong focus on reporting and uses an established network of informal communication to communicate project status and issues posing risks.
- There should be more emphasis on assessing forecasted costs at both the program and project level.
- Automated information systems are outdated and not well integrated. WSDOT is rich in management data, but its ability to use the data for management analysis is limited by a lack of system integration.
- There are examples of excellent regionally developed status reports that could be adopted in other areas.
- Standardized terms and a common definition of "project" are not utilized across all reporting systems, which lead to inconsistencies in data and poses risks to communication within and outside the organization.
- There is an established approach to decentralize project delivery to regions.

- Local organizational structures are generally appropriate for addressing local conditions, but some organizational approaches demand special attention to maintain a project-wide accountability focus.

General Conclusions

WSDOT fosters local innovation to help improve the performance of project delivery and adapt to the uniqueness of local challenges. However, in order to instill some of the stronger practices across WSDOT, it may be necessary to establish additional mandatory project management standards, in addition to the current principles and tools offered. WSDOT has variety in its project delivery practices and organization, and is continuing to improve its project management disciplines. Opportunities exist for staff to learn from exemplary practices in place in some areas.

Capital delivery at WSDOT is evolving from a program-focused to a project-focused orientation. These are strong practices, which currently aren't universally adopted due to their youth, a focus on local autonomy that can slow implementation, and resource constraints. A lack of standardized definitions poses challenges to project reporting, communication, and clear expectations for accountability.

Summary of Management Recommendations

Recommendation 1 – WSDOT should extend the application of the Managing Project Delivery, Project Delivery Information System, and Primavera Project Planner for the Enterprise tools and put management steps in place to confirm their adoption.

Recommendation 2 – WSDOT should develop a plan and timeline for implementing recommendations issued by Gannett Fleming, which center primarily on a) using existing exemplary practices in place at some projects to develop minimum standards and/or templates; b) improving the clarity of project communication by documenting terms and definitions; and c) confirming the consistency and currency of reporting information.

Recommendation 3 – WSDOT should conduct an assessment of the effectiveness of current information systems and options for addressing any deficiencies.

Recommendation 4 – WSDOT should develop criteria for extending Cost Risk Estimating and Management (CREM) analyses to a wider universe of projects

Options for Future Audit/Study Topics

Audit/Study Topic 1 – Audit the effectiveness of Managing Project Delivery (MPD) and the Project Delivery Information System (PDIS) in improving project delivery (with a delayed audit date to allow further agency implementation).

Audit/Study Topic 2 – Audit the practice of determining construction contractor pay estimates.

Audit/Study Topic 3 – Conduct an assessment of contracting methods that are alternatives to the traditional design-bid-build process, such as alliance contracting.

Audit/Study Topic 4 – Conduct a comparative assessment of project delivery performance measures to evaluate actual WSDOT performance compared to similar organizations.