

Phase 2 Update of the Strategic Delivery Plan
for the
Washington State Department
of Transportation's
Capital Construction Program

Prepared by:



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Revision History

Name	Date	Reason For Changes	Version
RJ Berg	April 23, 2008	Initial 95% Outline draft	1
RJ Berg	May 2, 2008	Initial PCRO and Internal review for content	2
RJ Berg	May 20, 2008	PCRO Review Version	3
RJ Berg	May 23, 2008	Client Review Draft (EOC)	4
RJ Berg	June 19, 2008	Final Review Draft	5
RJ Berg	June 30, 2008	Final	6

EXECUTIVE SUMMARY

PURPOSE

The Washington State FY08 Supplemental Budget legislation contained the following proviso:

"The consultants shall provide an updated copy of the capital construction strategic plan to the legislative transportation committees and to the office of financial management on June 30, 2008, and each year thereafter."

ESHB 2878, April 2008

SPMG OVERVIEW

After the enactment of the Transportation Partnership Act in 2005, WSDOT hired a team of nationally recognized consultants known as the Statewide Program Management Group (SPMG) to assist in the overall management of the delivery of \$15 billion in transportation projects over a 16-year period in a two-phased work program. This decision was based on studies of other state DOT's and input from transportation industry experts on program delivery approaches. The Phase 1 effort was kicked off in December 2005 and was focused on the development of a strategic plan for delivery, which was completed in June 2006. The Phase 1 Plan¹ included recommendations for delegation of authority to provide the department with flexibility in funds management to avoid project delays, proposals to ensure an adequate and skilled workforce would be available to deliver the capital program, and the development and implementation of effective project management processes and tools that support effective and efficient project control and reporting. The SPMG Phase 2 work program extended the services of the team through 2010 to assist WSDOT in the implementation of these recommendations under strong state ownership.

Statewide Program Management Plan Objectives

1. Identify what actions are needed to enable WSDOT to **deliver** projects successfully and,
2. To **report** these projects properly.

Phase 1 Work Program Summary

SPMG conducted various needs assessments and gap analyses, and then identified and evaluated options for improving delivery success. These assessments were presented in an Interim Report², published in March 2006. Afterward, SPMG conducted a Peer Review of the WSDOT delivery plan using national specialists in transportation program delivery. Additionally, in an effort to improve the efficiency of WSDOT's delivery of projects, an analysis of industry-standard Best Management Practices (BMPs) was performed. The analysis compared and contrasted these BMPs with WSDOT practices and identified gaps between standards and practice. Following publication of the June 2006 Strategic Plan, the Phase 1 effort concluded with SPMG issuing a Supplemental Report³ on recommended capital budgeting and reporting options.

PHASE 2 DELIVERY RECOMMENDATIONS UPDATE

Since completion of the SPMG Phase 1 Strategic Plan in June 2006, major progress has been made in the delivery of the State's unprecedented transportation construction program. SPMG estimates that by the end of June 2008, **WSDOT will have either completed or have under construction more than 55% of the WSDOT projects funded by the Nickel and TPA.** These projects' costs represent 44% of the total program budget. The Phase 1 Strategic Plan set the framework for meeting the challenges that this successful delivery effort implies.

Within the context of this expanded construction program, WSDOT has implemented a number of Phase 1 recommendations that meet the Strategic Plan objectives. This Phase 2 Update summarizes current program delivery challenges that include a tripling in biennia spending over a six-year period, as well as significant construction materials cost increases and limited resources. This report provides an overview of the Phase 1 recommendations and SPMG's suggested refinements that are being considered or actually being implemented as part of the Phase 2 work program. This Update is organized into the same three major topical categories used in the Phase 1 Strategic Plan:

1. **Management Issues** – summarizes the Phase 1 problems and proposed solutions, along with Phase 2 refinements, that address PM Culture, long-term sustainability of skills and resources, and organizational methods for efficient delivery of the program.
2. **Workforce Improvements** – summarizes problems, proposed solutions, and Senior Leadership Group Action Plan and Phase 2 refinements that include a Project Management Academy training program, recognition of career advancement using external PM certification programs, and the definition of a Project Controls Career path.
3. **Project Management Processes, Control and Reporting Systems** – again, this section summarizes problems, proposed solutions, refinements including implementation of BMPs, development of the Project Management and Reporting System (PMRS) vision and goals, and refined system description, along with its current budget and schedule.

SUMMARY OF PHASE 2 MAJOR FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Management Issues

1. The delivery challenges identified in Phase 1 are increasing in intensity as the department moves into the height of programmed construction. Planned expenditures have doubled from two years ago and are forecasted to peak next biennium. Inflation of materials and other contract costs have risen, eroding the financial stability of the programs. Budgets deemed adequate three to four years ago are not sufficient to meet legislative expectations. Nonetheless, SPMG finds that WSDOT has made significant

progress in delivering the desired program in that 55% of the TPA and Nickel projects promised to the legislature have been completed or under were construction by June 2008.

2. To meet these cost challenges, SPMG recommends that executive leadership increase its emphasis of intense management oversight to save money for use elsewhere. From the top down, the department should continually advance the concept that to meet budget targets and schedule milestones is not the only objective of a successful program; an increased focus by the delivery teams is needed to continually seek cost reductions, wherever practical, to provide alternative solutions that correct deficiencies by delivering the intended functionality in order to stretch the remaining program funds to the maximum extent possible.
3. Due to these delivery challenges, the legislative commitment to specific scope definition, schedule milestones and budget targets should be accomplished following the completion of the 30% design phase. The Phase 1 Supplemental Report contained the following recommendation that is repeated here for emphasis: ***The (legislative) budget should provide WSDOT a regularly funded account to use for development of selected unfunded projects that have not been progressed to a reasonable level of scope definition. Once the preferred alternative has been selected and 30% design has been complete, then WSDOT should establish a project's baseline budget and the associated schedule milestones containing reasonable contingency at the project level. This would ensure that the projects, once scope is defined, contain both individual schedule and risk premium contingencies, as well a project level contingency appropriate to the degree of project development. Prior to meeting this threshold, WSDOT should carry the costs of project definition in the project development account. WSDOT should report quarterly on the use of these funds by individual project development initiatives, but not against a specific project baseline budget or schedule.***
4. SPMG recommends that the leadership continue to instill a sustainable project management culture throughout the department. WSDOT is well on the way to becoming a project-centric organization, but there are steps that still need to be taken to be more effective in delivering projects on-time and within budget. These include: formalizing the champion for project management within the department by clearly assigning project management processes and procedures to a single director level position as opposed to disbursing these into functional areas; aligning the different delivery organizations to employ uniform best management practices based on guidance from headquarters; and fostering the development and mentoring of the profession of project managers and project controls specialists in the department.
5. On the front lines, the key to developing a sustainable project management culture is to empower the Project Manager in the typical WSDOT matrix organization. Management should drive the department to become more project-centric, such that the title "Project Manager" is recognized and used as the common term on a day-to-day basis as the single individual with the responsibility and authority for project delivery in the department.

6. At the state level, change the responsibilities of the PCRO to become the Project Management and Reporting Office, headed by the Director of Projects with staff experienced in project management and controls.
7. Congruent with the Recommendation 3, WSDOT should also involve project teams and employ project management processes early on in the establishment of a project's scope, schedule and budget prior to it being "locked in" by SAPD and the Legislature. WSDOT staff from several regions has expressed a desire to be involved earlier in the scoping process to assist with the development of projects with more realistic scope, schedules and budgets. This would include assigning a project manager who would oversee the scoping phase as a formal project by applying fundamental project management processes, as set forth in a new scoping policy or procedure that would be drafted and incorporated as guidance in an updated section of the PM Online Guide.
8. As appropriate to workload flexibility, span of control, and efficient use of skilled resources, implement a regional project controls office headed by a Regional Manager of Projects to house the specialists that will be needed to implement the business processes and operate the sophisticated software tools the agency has adopted. Each region has the flexibility to delegate this function to the appropriate functional level to meet project and project office needs, and to accommodate current and planned organizational structures.

Workforce Improvements

9. Continue implementing the Phase 1 workforce improvement recommendations contained in the Senior Leadership Group's Workforce Improvement Action Plan.
10. Define, develop, and implement a project controls specialist career path within the department based on the SPMG concept presented herein. This includes defining opportunities for growth that use project controls skills and work experience, along with the ability to offer competitive pay.
11. Continue to encourage and support individuals to become certified as project managers or project controls specialists.
12. Establish virtual "communities of practice" to foster professional development and knowledge sharing in project management and project controls.
13. Address under-performance or lack of direction for struggling project managers in constructive and enabling ways that include mentoring and training as part of the individual's development program. Include competency and accountability measurements for project success or failure.
14. Enhance current programs to identify emerging professionals as candidates for a project management or project controls career path.

15. Hire WSDOT internal PC staff at least 60 days prior to PMRS deployment.
16. Close the gaps in basic project management skills by expanding the delivery of fundamental department PM training as a prerequisite for PMRS end user training.

Project Management Processes, Control and Reporting Systems

17. WSDOT has made considerable progress in the implementation of the Phase 1 recommendations relating to BMPs. In the last two years the department has completed, or has under active implementation, almost 90% of over 100 recommendations dealing with business processes, policies, and procedures.
18. SPMG recommends that the department begin implementing, on a pilot basis, a pro-active "lessons learned" program that entails independent project management peer reviews at the regional level performed by experienced project managers at the 30-35% complete stage, to assure that project teams are endorsing a correct scope, schedule and budget to help avoid struggles with delivery issues, and are provided informal and confidential help before the project enters the damage recovery phase. This activity (outlined in Appendix 3) could be done after the project is well defined in order to establish realistic baselines of scope, schedule and budget, as opposed to adopting legislative scope description when the project is defined solely as a need or deficiency. In the Phase 1 Supplemental Report, SPMG recommended that a special account be established to fund project definition so that accurate baselines can be adopted at the 30% design level. See Recommendation 3 on page 3.
19. The department has made significant progress on the implementation of the PMRS. The major accomplishments include:
 - ✓ Established the agency vision and direction of the PMRS
 - ✓ Project initiation approved by Information Services Board
 - ✓ Refined Strategic Plan deployment approach for stepped release of software in a stand-alone environment
 - ✓ Completed definition of the project and schedule as contained in the project management plan
 - ✓ Obtained approval and funding for the \$17.3 million project
 - ✓ Defined business and user requirements for software selection
 - ✓ Successfully selected vendors for software, integration, and external quality assurance
 - ✓ Obtained and installed hardware and software licenses
 - ✓ Completed definition of the integration with legacy systems
 - ✓ Prepared training materials for tools and skills development
 - ✓ Completed workflows for streamlined project change control forms
 - ✓ Implemented Project Content Management functions in two regions and began pilots in two other regions
 - ✓ Established electronic processing of daily field reports for inspectors

- ✓ Developed for adoption the policies, procedures, and guidance documents that drive the uniform business practices the department is implementing
- ✓ Completed and deployed the PMRS Web portal and associated linkages to companion systems and tools
- ✓ Completed initial development of legacy system reports accessed through the Web portal.

20. As of June 2008, the department is 50% complete with the design and implementation of the PMRS. It is on schedule for deployment of the first portion of the integrated system this August, with completion of the full deployment targeted for two years from now, by June 2010.

21. Most importantly, communications with the end users of PMRS needs improvement. The key message should include emphasizing that business process changes are refinements to WSDOT current practices, and the new tools are essential for supporting these refinements. The PMRS is not the silver bullet that will solve all project management problems. SPMG intends to use graphics to help define typical end users and to communicate the realistic expectations of the PMRS to them within WSDOT.

In summary, WSDOT as a whole continues to move toward a strategic project-centric organization. It has already established the Project Controls and Reporting Office (PCRO) and the development of the Project Management Online Guide. It is now refining and expanding its uniform project management and control business policies and procedures. To support these business practices, the department is implementing the PMRS suite of tools along with extensive training of staff to support project delivery. In doing so, WSDOT is moving well along its journey of strengthening the project management culture of the department and implementing advanced industry-standard best management practices. These actions are in accordance with the department's over-arching Strategic Plan objectives to:

1. Identify what actions are needed to enable WSDOT to **deliver** projects successfully and,
2. **Report** these projects properly.

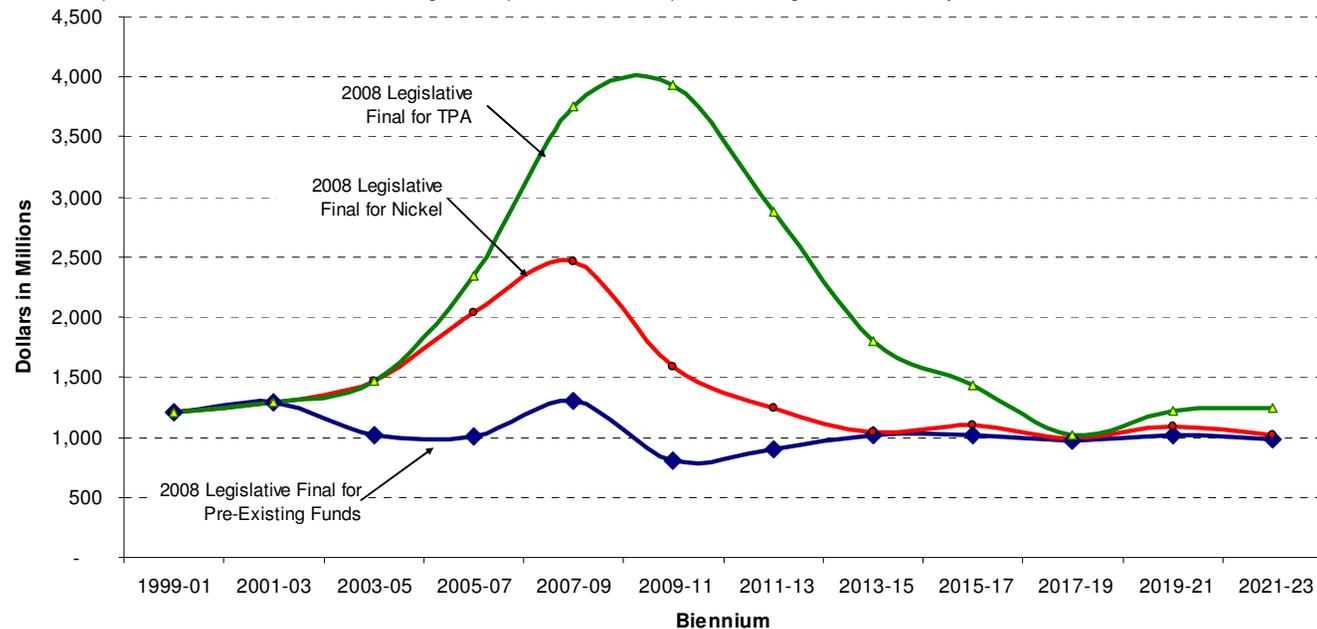
PROGRAM DELIVERY CHALLENGES

On May 9, 2005, the Governor signed into law the “2005 Transportation Partnership Funding Package.” This major capital construction program provided a \$7.1 billion increase in spending for highways, ferries, and other multi-modal transportation projects over the next 16 years. When added to existing funding, the total program profile created a “Mt. Rainier” peak in biennium spending as shown below. Spending was programmed to rapidly increase from \$1.4 billion in FY03-05 to \$3.9 billion by the FY09-11 biennium. The FY07-09 biennium budget was increased this last session to \$3.76 billion from the 07LEGFIN of \$3.68 billion by the legislature. Figure 1 shows the current budget projections going out to FY2021-23.

WSDOT recognized that the delivery of a program this size required more than just working harder and longer; it needed pragmatic leveraging of its own internal capabilities, use of available outsourcing resources, improvement in its project delivery management processes and systems, and the authority to make certain adjustments to project components in order to respond to changes.

**Highway Construction Program, by Type of Funds
2008 Legislative Final Budget - 4/08**

*Includes Preservation and Improvement Programs with two exceptions
Excludes expenditures for the Tacoma Narrows Bridge and expenditures in the Improvement Program reimbursed by Sound Transit*



**Figure 1 – WSDOT
Construction Spending**

DELIVERY CONSTRAINTS AND BARRIERS

The Phase 1 Plan identified the challenges the department faced as it addressed the programmatic and resource constraints impacting delivery success. These constraints and barriers are products of nine drivers or catalysts that impact program delivery as shown in Figure 2. The constraints and barriers are:

- **Core Competencies** – the availability and retention of skilled engineers and construction specialists to meet the forecasted need of hiring 440 new and replacement staff.
- **Training** – those hired have little experience, requiring the allocation of resources for training.
- **Outsourcing Capacity** – consultant, contractor, third-party, and resource agency staff limitations.
- **Costs** – continue to escalate sharply and jeopardize cost estimates and budget expectations.
- **Inflexibility** – lack of WSDOT management authority to make modest adjustments to scope, schedule, and budget precipitates a growing potential for needless major project delays.
- **Speed to Change** – while the legislature has authorized funds for capital construction of individual projects, WSDOT’s project control and reporting systems and its headquarters funding resources were constrained in their ability to implement a feasible Project Control and Reporting solution in a timely manner due to the long periods in the legislative funding cycle. This constraint has been overcome by the direct funding for the PMRS.

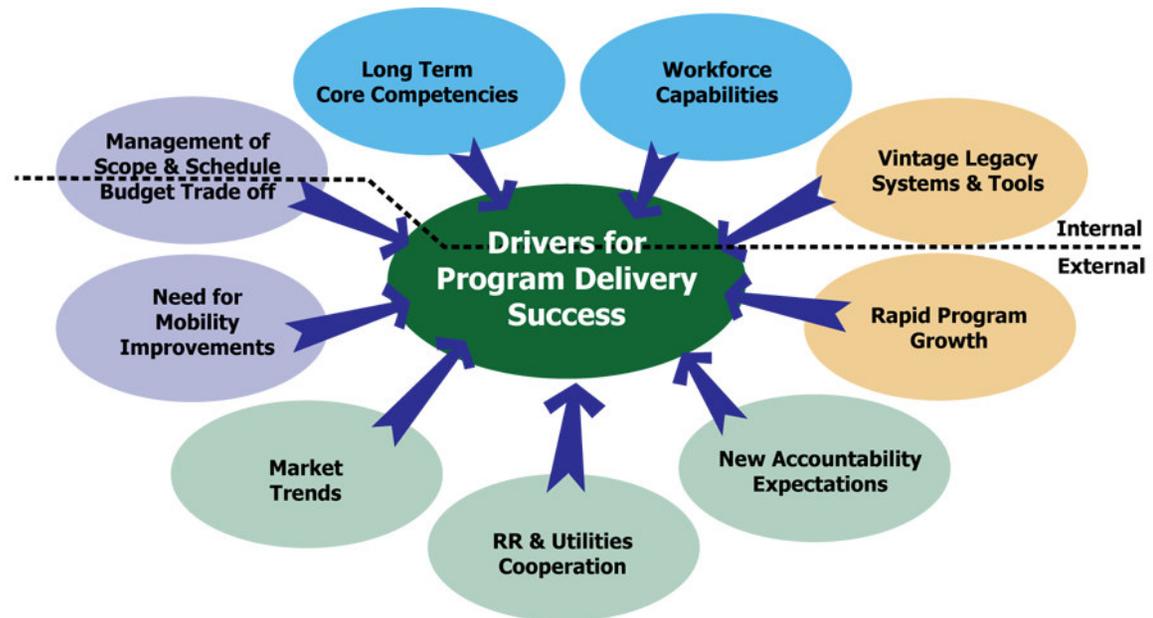


Figure 2 – Drivers of Successful Project Delivery

OVERVIEW OF PHASE 1 RECOMMENDATIONS AND PHASE 2 REFINEMENTS

PHASE 2 WORK PROGRAM SUMMARY

In Phase 2, WSDOT is utilizing the SPMG to assist with the implementation of the Strategic Plan recommendations in the areas summarized in Table 1.

Table 1 – SPMG Phase 2 Work Program Summary

Major SPMG Activity	Agency Benefits
Provide co-located project management staff to augment and support the regions, modes, and headquarters in project control, costing, scheduling, contract management, and reporting functions.	<ul style="list-style-type: none"> ○ Augments and enhances WSDOT project delivery with critical analytical skills in project management functions ○ Assists in the implementation of effective BMPs ○ Provides continuous training to agency staff in advanced PM skills through a mentoring and cooperative environment ○ Supports strong state ownership of responsibility for project delivery ○ Provides program delivery analysis at the project level ○ Alerts WSDOT to delivery issues and roadblocks so that remedial actions can be taken in a timely manner.
Develop a new Project Management and Reporting System (PMRS) based on commercially available and nationally utilized software capable of supporting implementation of industry-standard BMPs, such as earned value and cost-to-complete, to efficiently track and report the expanded construction program.	<ul style="list-style-type: none"> ○ Provides accurate and reliable data for timely decision-making ○ Improves reporting capabilities ○ Improves cost control, claims avoidance, and contract administration ○ Increases process efficiency essential to delivering the large capital construction program using modern industry-standard project management tools to effectively manage the program.
Develop a Project Management Academy program to train WSDOT project managers on best project management practices, and develop other PM processes and training to enhance the PM culture of the department.	<ul style="list-style-type: none"> ○ Trains staff on project management best practices ○ Facilitates transfer of industry skills in managing complex projects to agency staff ○ Enhances recruitment and retention by signaling WSDOT as a preferred employer able to meet delivery challenges.

MANAGEMENT ISSUES

Problem

WSDOT cannot deliver this program on its own; successful delivery is still founded on a collaborative effort among the Governor and the Office of Financial Management (OFM), the legislature, the department, and various groups who have statutory roles in overseeing and administering the program. Initial enabling legislation constrained WSDOT's flexibility to meet changing project needs. To address these needs, SPMG provided the following proposed solutions.

Proposed Phase 1 Solutions

- ✓ Empower WSDOT, via the legislature, to develop efficient processes for managing changes in a project's scope, cost, or schedule that correct legislatively identified problems as a "functional deficiency" within an approved budget and schedule, in order to balance accountability and achievement of the public's trust with flexibility that avoids unnecessary delay or indecision.
- ✓ Establish reviews and decision-making authority at high enough levels to discourage unwarranted change and encourage innovative ways to keep projects on track, while delegating authority to the lowest level appropriate for dealing with the consequences of the decision.
- ✓ Place more accountability on the regions and Project Managers for early identification of potential changes.
- ✓ Prior to Quarterly Project Review (QPR) meetings, provide documentation that evaluates proposed changes in terms of content and specific action items that will be proposed at QPR meetings.
- ✓ Delegate authority to the Department—and establish thresholds similar to those for Pre-Existing Funds Projects—for approval of modest changes.
- ✓ Document and report to OFM modest changes made at QPR meetings for consent approval.
- ✓ Revise upward the "dollar" thresholds established for cost and scope changes to recognize the dynamics of the marketplace, in terms of escalation of construction and delivery costs. Index the thresholds, or at least revisit them, annually.
- ✓ Increase the use of contracting mechanisms that encourage control of scope, cost, and schedule; such as lump sum, "design to cost," and schedule-based incentives.
- ✓ Add programmatic-level contingency funds independent of specific project budgets that allow WSDOT at the modal, regional, and headquarters level to manage within a range of cost, schedule, and scope variables, while committing to delivering every project in the programs authorized by the legislature.
- ✓ Report all changes at the project and program levels.

Refinements to Management Recommendations

ENHANCING A COST CONSCIOUS PM CULTURE IN WSDOT

The WSDOT culture can be described as a decentralized engineering focus to project delivery. The department desires to enhance this culture by fostering within it a strong project management focus. SPMG has been tasked with assisting WSDOT in this journey.

Specifically, in relation to WSDOT (and any other government, corporate, or social group), the underlying culture represents a synergistic set of shared ideas and beliefs associated with a distinct way of life in the specific organization. Thus, it is readily recognized that it has taken years for an existing management culture to evolve. Equally significant is the recognition that to change an existing culture requires major effort, and progress does not happen quickly. There is no quick and easy fix, only steps on a very long journey.

- ✓ **“A journey of a thousand miles (or \$15 billion) starts with a single step...”**
- ✓ **PMRS is an essential first step in updating WSDOT systems.**

SPMG Phase 1 Strategic Plan, June
2006

Cultural change occurs over an extended period during which an organization’s identifying values are fashioned in an evolutionary way; it should be viewed as an organizational journey, not an event. Washington State Department of Transportation has stated that it carries out its mission of planning, designing, and constructing capital transportation improvements for the traveling public by delivering projects. This project-oriented culture, WSDOT’s way of life, is a proven means of meeting its obligations to the traveling public, communities, legislature, and taxpayers. To further this, SPMG recommends that WSDOT characterizes its processes as a way of life that represents and embraces, and indeed espouses, a project-driven organization.

WSDOT has already taken some strong steps toward becoming a focused project-driven organization. These include:

- ✓ Assessed WSDOT’s project management processes.
- ✓ Selected vendors and now implementing industry-proven commercially available software into the WSDOT projects.
- ✓ Conducted six Project Management Academy sessions (240 participants).
- ✓ Currently developing enhancements to three existing WSDOT Project Management training courses.
- ✓ Developed training for hands-on and management use of the selected commercial-off-the-shelf project management software.
- ✓ Developed a Sustainability Plan for ensuring success in the use of the project management processes and PMRS tools, including the Enterprise Content Management system.
- ✓ Included a session on project management and project controls at each regional design/construction conference.

- ✓ Currently preparing a strong and specific directive applicable to all regions and modes regarding the expected implementation and use of the project management systems for project delivery management.
- ✓ Developed draft policies and procedures that emphasize uniform and proven management practices throughout the agency.

These significant actions have not only been endorsed by WSDOT, but the department is actively leading the implementation effort. Nonetheless, studies have shown that improved management tools and training in their use are not sufficient to move an organization into a higher level of project management performance.

As SPMG completed its Phase 1 work, regions began to mobilize internal, General Engineering Consultants (GECs), and SPMG resources co-locating in WSDOT offices for Tier 2 and Tier 3 support. The levels of support provided by SPMG are:

- Tier 1 – SPMG support of PC&R at the headquarters level
- Tier 2 – SPMG support of PC&R at the regional or modal level
- Tier 3 – SPMG support of PC&R at the project office or GEC level

Based on this co-location, SPMG personnel recognized that WSDOT's strong culture of engineering management focused the authority for project delivery at the Project Engineer level—well above the reality that day-to-day responsibility for project delivery was held at the design manager level. In a matrix organization, this type of split of authority and responsibility impedes effective project oriented actions. SPMG also realized that, on a day-to-day basis, the job title of "Project Manager" did not exist or was not commonly used throughout the department. The lack of use of this industry term and the associated definition of responsibilities and commensurate authority was apparent at Quarterly Project Review (QPR) meetings, as well as in day-to-day activities in which Tier 2 and Tier 3 personnel participated.

WSDOT has been recognized for delivering, and continues to deliver, capital projects successfully. However, the example above illustrates that there are still gaps between its current project delivery approaches and an ideal project management culture. In order to close this perceived cultural gap and enhance WSDOT's delivery capabilities, there are several steps that SPMG believes should be taken. These include:

- ✓ Establish a Project Management Cultural Change Charter
- ✓ Create a Project Management Cultural Change Steering Committee
- ✓ Communicate the Project Management Cultural Change mission to the organization

- ✓ Finalize the Project Management career path along with formal use of this title within the organization's policies and procedures. Embed the term "Project Manager" within the agency as the correct point of authority and responsibility for project delivery
- ✓ Support this path with a comprehensive training and development program, supplemented by appropriate recognition and rewards stemming from proven experience and certification
- ✓ Determine the ideal WSDOT project management culture goals and assess these against any gaps between the current project delivery approaches and the desired project management culture that can be created by this goal refinement
- ✓ Review the SPMG Phase 1 Gap Analysis to determine the strategy for closing any newly identified gaps
- ✓ Refine the Phase 2 BMP implement plan (both near and long-term) and related schedules for closing the gaps
- ✓ Measure and report on progress toward these goals
- ✓ Use demonstrated successful project management as a core competency to evaluate promotions and developing executive leadership program participation.

In the interim, it is believed that WSDOT could make some additional changes in the near-term to help ensure its transition to a fully functioning and successful project management culture. These changes should include:

1. A "champion" from WSDOT executive management who not only sponsors, but also drives and supports the implementation and use of cost-effective project management at all levels of WSDOT. This champion should reflect the values of the organization and be the spokesperson for cost-effective project delivery to meet the challenges of a weakening funding base.
2. To meet these challenges, SPMG recommends that executive leadership increase its emphasis of intense management oversight to save money for use elsewhere. From the top down, the department should continually advance the concept that only meeting budget targets and schedule milestones is not the objective of a successful program; an increased focus by the delivery teams is needed to continually seek cost reductions, wherever practical, to provide alternative solutions that correct deficiencies by delivering the intended functionality in order to stretch the remaining program funds to the maximum extent possible.
3. Adopt a vision and set of goals for a change to corporate culture, including a strategic Project Management Office.
4. Change the Project Control and Reporting Office (PCRO) to function as a definitive Project Management Office (PMO), including both setting and enforcing project management and project controls standards across the WSDOT organization. This means more than just changing the office name to the Project Management and Reporting Office; it means becoming

the recognized authority for owning, developing, and implementing project management best practices and tools. You are well on the way in this journey, but more steps need to be taken.

5. Establish a state-wide position of Director of Projects within the PMO. At the regional level, establish a similar position of Manager of Projects. Both positions would be the primary focal point for project management activities in the department. The separate duties and responsibilities for each position are outlined in Appendix 1.
6. Continue to establish a consistent project management and project controls approach throughout WSDOT through constant application of the newly drafted policies, procedures, and guidelines.
7. Develop and articulate the power of the PM in a matrix organization regarding the capability to influence people's actions—train people how to do this.
8. Provide a strong experienced Project Controls lead on the PCRO staff, named as the WSDOT Manager of Project Controls, to provide overall direction for project controls activities throughout the agency.
9. Make project management and project controls competence important factors in WSDOT management and staff performance reviews.
10. Ensure continuity in the management of the PM culture change. To help with this, the PCRO Director position should not be a rotational assignment during the implementation of the project management systems, procedures, and standards as they are put in place, become operational, and produce positive results for the agency.
11. Project Controls Specialists assigned to regions, projects, and Specialty Groups should be matrixed to the PCRO to ensure overall commonality of WSDOT project management approach and systems use.
12. WSDOT must recognize that training is only a small, albeit very important piece, of the whole project management culture, and emphasize the need for minimum standards of project manager capabilities and competencies.
13. Create internal programs or mechanisms that recognize successful project teams and project managers; such as a Project of the Year award (a team award) for different types or complexity of projects, and a professional papers competition on PM

topics (individual awards). Publish the results, recognize all the project participants, and reward the top 10 project managers with appropriate individual recognition and/or monetary incentives—celebrate your successes.

14. Address project under-performance or lack of direction in constructive ways:
 - For struggling project managers, use highly successful project managers to provide individual or project peer reviews that remain internal to the project.
 - Direct struggling project managers to utilize a mentor drawn from successful project manager volunteers.
 - In a more direct manner, provide training for struggling project managers in specialized areas of leadership, communication, project risk assessment, and project planning and recovery. This would include attendance at the PM Academy.
 - Drill down below the Senior Leadership Group and the Lead Programs to establish an Emerging Professional's Network within the department focused on identifying and directing the best and the brightest into a project management fast track through a structured development program.
15. Create a formal mentoring program for both WSDOT project managers and project controls specialists across regional and Specialty Group boundaries. Mentors would be drawn from senior practicing project managers that have achieved success through recommendation 13. Another source of mentoring would be to offer those who are contemplating retirement the opportunity to work part-time in mentoring and training of upwardly mobile project managers, as well as those struggling to achieve success.
16. Expand the existing WSDOT "lessons learned" website and establish a protocol for documenting and distributing project management related lessons learned from all projects at the close of each project phase.
17. Work with WSDOT Staff Development personnel to ensure that all courses include, at a minimum, a brief discussion of project management and project controls.
18. Initiate a definitive WSDOT program to promote project management and project controls specialist certifications as part of overall career advancement for staff that includes a strong message for desirable career advancement opportunities.

Based on the information available and what the SPMG believes are the BMPs for large capital projects delivery, WSDOT should promote a project management and project controls specialist certification program for its staff. A certification program will create

benefits for WSDOT as an organization, the WSDOT workforce as a whole, and to the individual WSDOT staff members. There are three types of certification that exist today for project management practitioners and project controls specialists:

1. Certifications provided by recognized professional organizations
2. Certifications provided by organizations for their own staff
3. Certifications and certificates provided by educational institutions and for-profit training firms

Regardless of which approach WSDOT adopts to obtain certification for its project management and project controls specialists staff, the department should take the following steps to maximize benefits available from incorporating these certifications in its overall project management enhancement program:

- Develop and formally adopt a certification program, including buy-in from all affected parties, particularly with respect to WSDOT's collective bargaining agreement(s)
- Establish and publicize that achieving and maintaining the adopted certification(s) is a significant criterion in staff issues including:
 - Grade levels
 - Promotions
 - Salaries
 - Future assignments
- Formally recognize the roles and responsibilities of the Project Manager within WSDOT to address project management competency, and hold assigned Project Managers and their teams accountable for performance using the employee development and performance evaluation process
- Use the adopted certifications as selection criteria for recruiting new staff
- Ensure that WSDOT staff understand the significance of the certification(s) to their individual careers, most significantly that certification is a career step, not an end by itself
- Continue to develop, expand, and sustain WSDOT's own project management training program, focusing on its unique policies, work processes, and procedures. This includes sustaining the Project Management Academy using internal resources, as well as augmenting current WSDOT staff to expand PM training offerings.

ORGANIZATIONAL CHANGES FOR SUSTAINABILITY

Many research articles and books have been written about project management organizations. One study of over 500 projects found that those relying on the functional or functional matrix form of organization were less successful than those employing a balanced matrix, project matrix, or project team approach.⁴ Larson and Gobelli⁵ (as reported by Cleland and Ireland⁴) provide five basic definitions of these types of organizational structures:

1. **Functional organization** - the project is divided up and assigned to relevant functional areas with coordination being carried out by functional and upper levels of management
2. **Weak matrix** - a person is designated to oversee the project across different functional areas
3. **Balanced matrix** - a person is assigned to oversee the project and interacts on an equal basis with functional managers
4. **Strong or Project matrix** - a manager is assigned to oversee the project and is responsible for completion of the project
5. **Project team** - a manager is put in charge of a core group of personnel from several functional areas who are assigned to the project on a full-time basis.

Table 2 illustrates, in simplified form, the range of roles and responsibilities of primary project participants in these five different types of organizations.

Table 2 – Project Management Roles and Responsibilities in Different Organizations

Project Functions or Characteristics	ORGANIZATION TYPE				
	Functional	Weak Matrix	Balanced Matrix	Strong Matrix	Projectized (Team-based)
Project Manager’s Authority	Little or None	Limited	Low to Moderate	Moderate to High	High to Almost Total
Personnel Assigned Full-Time to Project Work	Virtually None	1-25%	15-60%	50-95%	85-100%
Project Manager’s Role	Part-time	Part-time	Full-time	Full-time	Full-time
Common Titles for Project Manager’s Role	Project Coordinator/ Project Leader	Project Coordinator/ Project Leader	Project Manager/ Project Officer	Project Manager/ Program Manager	Project Manager/ Program Manager
Project Management Administrative Staff	Part-time	Part-time	Part-time	Full-time	Full-time

Source: *The Strategic Project Office*⁹ – “Table 3.1 – How Projects Fit into Organizations”, p. 65.

The table also describes the direct control the project manager typically has over the resources that perform the work. The PM’s authority increases as an organization becomes more project-centric. Within the department, SPMG has observed that the PE culturally assumes the authority for project delivery, while the design manager has the responsibility of a typical PM. Under a project oriented organization, this authority is pushed downward to the project manager with the PE serving more as a project executive,

and the upper echelon of regional management (e.g., ARAs) providing oversight and facilitating the execution of work done by matrix service providers. SPMG has observed that some units operate as purely functional organizations while others are very project-centric organizations. Many industries in product development use functional departments as the lead in delivering projects. In the construction business, project-centric organizations are found to be more focused on successful project delivery.

In other endeavors, project-specific teams are formed and dedicated totally to the completion of a project. Table 3 summarizes the features of a “project-centric” organization. Crawford’s *The Strategic Project Office*⁹ discusses the rationale for establishing the best organizational fit for project delivery. Strategic project management in a growing organization is defined by Crawford as an evolutionary practice that goes through **three levels of development**:

Level 1 - Individual project management

Level 2 - Division or department level project management

Level 3 - Enterprise/corporate level project management (Strategic Project Office)

Table 3 – Features of the Projectized (Team-based) Organization

- ✓ Teams are accountable for performance
- ✓ Functional managers are resource suppliers, not resource owners
- ✓ Individual performance reviews are suspended; team performance is key
- ✓ Professionals have a say in their assignments
- ✓ Teams—not just managers—have access to senior management
- ✓ Everyone is trained for team-based work
- ✓ Team members stay with their team for the duration of a project

Source: Adapted by Crawford from Anne Donnellon, “Cross functional teams in product development: accommodating the structure to the process,” *Journal of Product Innovation Management*, Nov. 1993. pp 377-392.

Within WSDOT, different regions have different levels of evolutionary maturity. While one can’t apply a single model to all parts of the department, SPMG would estimate that in general WSDOT’s project management is very decentralized and would be classified between a Level 1 and Level 2 balanced or project matrix organization. The Urban Corridors Office has the most mature Level 2 stand-alone project controls office, supplemented by and also supporting projectized team-based organizations on its mega-projects. WSF Terminal Engineering is also progressing along this organizational path. Other smaller regions tend to perform more as a functional organization where the Assistant Regional Administrator has a direct span of control over functional group delivery assignments, while moderate to larger regions tend to emulate a balanced matrix organization wherein the PE is recognized as the individual with overall responsibility for Project Management of the parts of projects assigned to the PE Office.

In summary, WSDOT as a whole continues to move toward a Level 3 strategic project organization. It has already established the PCRO and the development of the Project Management Online Guide. It is now refining and expanding its uniform project management and control business policies and processes. To support these business practices, the department is implementing the PMRS suite of tools along with extensive training of staff to support project delivery. In doing so, WSDOT is moving well along its journey of strengthening the project management culture of the department.

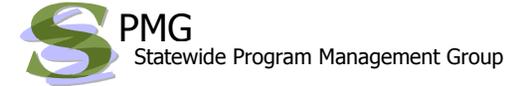
LEVEL 2 PROJECT CONTROLS OFFICE IN A REGIONAL OR MODAL BUSINESS UNIT

SPMG recommends that WSDOT implement Level 2 project controls groups or offices as appropriate in its regions and modes. The advantages of following this recommendation are to help provide for consistent implementation of the PMRS and its associated business processes, to achieve efficiencies in usage of critically skilled project controls specialist, and to balance costs of licenses and training with the need for effective and prompt service. This project controls organization would perform the day-to-day project controls and reporting operations and functions using PMRS. The rationale for this recommendation is as follows:

- ✓ Resources are limited – software licenses are not inexpensive and project budgets generally do not allow for ubiquitous usage and training of all possible end users throughout the department in every PE office
- ✓ The PMRS tools require specialized skills and knowledge to take advantage of their full capabilities. Staff skilled in these areas is not readily available
- ✓ Checks and balances on estimated cost-to-complete and objective earned values can be implemented for better control of cost and schedule impacts using a group independent of the project design or delivery team
- ✓ Efficiency, staff balancing, and uniformity of results can be achieved between projects and regions for effective control and reporting
- ✓ Control of the tools configuration is effectively done by specialists trained in its detailed use, as opposed to generalists doing many different functions

This recommendation is made recognizing that flexibility is also a key driver in the delivery of projects by regions of different size with varying degrees of complexity, and the need for hands on control. In some regions where the complexity of the program is moderate and the growth of the program is flat, SPMG recognizes that decentralization of these services to each PE office may be the preferred method to provide flexibility without organizational growth. In some cases, the most appropriate organizational approach for specific projects would be to assign project control specialists to individual project offices as the workload demands.

Phase 2 Update of the WSDOT Capital Construction Strategic Delivery Plan



The example highlighted to the right illustrates the avoided cost and benefits of using this approach with temporary consultant help. The PE, Brian Dobbins, estimated the savings to the department was well over \$1 million on a single project. As WSDOT moves to implement these practices and develop the required skills internally within the department, the frequency and effectiveness of these savings will multiply, regardless of the organizational approach, whether with full-time state staff, or with temporary consultant assistance.

In the engineering and construction industry, the Level 2 Project Controls Office generally provides the following functions:

- ✓ Cost planning and tracking
- ✓ Scheduling, planning, and maintenance support
- ✓ Cost estimating support
- ✓ Project Support – including document control, change control, and project document and knowledge repository
- ✓ Reporting – issues tracking, periodic progress reporting, and ad hoc reporting
- ✓ Risk management
- ✓ Resource Repository – inventory of available resources for use on projects including materials and equipment (frequently found in a contractor's or manufacturer's organization)
- ✓ Software support
- ✓ Procurement and contract administration support.

"You asked for a progress update on using ascheduler for WSDOT's construction work on SR202. Why did we hire a ... scheduling expert on a WSDOT construction project? First, we did not have the technical skills to cost load the contractor's critical path schedule to accurately predict our monthly expenditure with precision across two funding seasons. Secondly, we needed a construction scheduler to advise us on schedule and cost impacts for both WSDOT and contractor delays. Delays to the early completion critical path were unacceptable. Each month the project is delayed would cost WSDOT \$240,000 in additional engineering costs. Staying focused on the critical path saved WSDOT almost 6 months of additional engineering costs estimated at \$1.4 million (while)we spent roughly \$9,000 per month for 30 months."

Brian Dobbins, PE
April 2008

WSDOT does not need to perform all of these functions in a single office or business unit. The majority of functions pertinent to the department's work of delivering and reporting on capital construction projects relate to budgeting, cost tracking, scheduling, cost estimating, forecasting, and reporting.

WORKFORCE IMPROVEMENTS

Problem

When SPMG reviewed the planned work program in Phase 1, it found that the combined workforce needed (WSDOT plus consultants) to deliver the capital program during the current and next biennium is approximately 6,000 full-time equivalents, as compared with a present workforce of approximately 3,000 (2,400 state employees and 600± consultant staff). WSDOT recognized that to meet this challenge of a peak work force of 6,000 could only be handled with judicious in-house hiring and staff augmentation through consultant out-sourcing.

Proposed Phase 1 Solutions

- ✓ Maximize the use of existing resources by clarifying core competencies and offering incentives
- ✓ Expand recruitment and staffing to a national level with an emphasis on selling the state program to attract needed skills. Optimize recruitment and retention by becoming the “Employer of Choice”
- ✓ Incentivize the contracts of major project General Engineering Consultants to emphasize efficient delivery and transparent accountability.

WSDOT assigned to its **Senior Leadership Group (SLG)** the responsibility of reviewing these recommendations and developing an action plan for their implementation.

SLG Workforce Improvement Action Plan

The Senior Leadership Group summarized its workforce improvement recommendations as follows:

1. Workforce Alignment
 - Prepare internal strategic plans at regional level
 - Communicate these fully
2. Recruitment/Employer of Choice – Marketing Plan
3. Retention
 - Salaries
 - Post retirement offers
 - Mentoring
4. Core Competencies Development
 - PE requirement

- CM
 - "Super PE"
 - Certifications and incentives
5. Partnering with Industry
- Core staffing
 - Varied use of consultants
 - Knowledge transfer

Refinements to Workforce Improvement Recommendations

Since the completion of the Phase 1 work effort, WSDOT has hired internally, supplemented its resources with complementary General Engineering Consultant teams to assist with increased program delivery or complex projects, applied design-build strategies where appropriate to achieve compressed project delivery, and augmented its offices with project specific out-sourcing assignments to the consultant community while maintaining strong state ownership and oversight.

PROJECT CONTROLS CAREER PATH AT WSDOT

There are two significant challenges that WSDOT faces in moving forward with implementing a Level 2 project organization:

1. The establishment of project controls career path opportunities and,
2. The ability to offer market competitive pay.

Building on the PM Culture recommendations presented previously, SPMG was asked to focus on the definition of an appropriate career path for Project Controls Specialists in the department. Historically, WSDOT has required or preferred an engineering education or PE qualifications for many positions. These are very valuable qualifications for the agency and its work; however, many good project controls professionals have backgrounds in construction management, business administration, or technology, and would not meet these standards. As a result, existing staff are performing one or more of the project controls related duties on a part-time basis, along with other work within their classification, and are unwilling to specialize due to the uncertainty about where the Project Controls path leads in the organization. Figure 3 on the following page depicts a possible career path for WSDOT consideration.

Implementing a structure of this nature represents a change within the agency and could possibly take several years to implement in a manner that satisfies the agency's needs, taking into consideration the management and labor issues that would require resolution. WSDOT has proceeded with hiring Project Controls Specialists in most regions so some elements of this approach have been implemented informally on a project or regional basis, as a trial, while the more formal processes proceed.

One proposal for WSDOT consideration is the development of a project controls career path that meets the following criteria:

- ✓ Promotes skill progression and provides incentives for staff to seek training and opportunities within the project controls discipline and beyond
- ✓ Encourages staff retention
- ✓ Is supported by WSDOT training infrastructure
- ✓ Accommodates individuals with either engineering or non-engineering training and backgrounds
- ✓ Provides opportunities for cross-training between the engineering and project controls disciplines
- ✓ Offers salaries competitive with other Washington State public agencies
- ✓ Is strongly supported by WSDOT Executives.

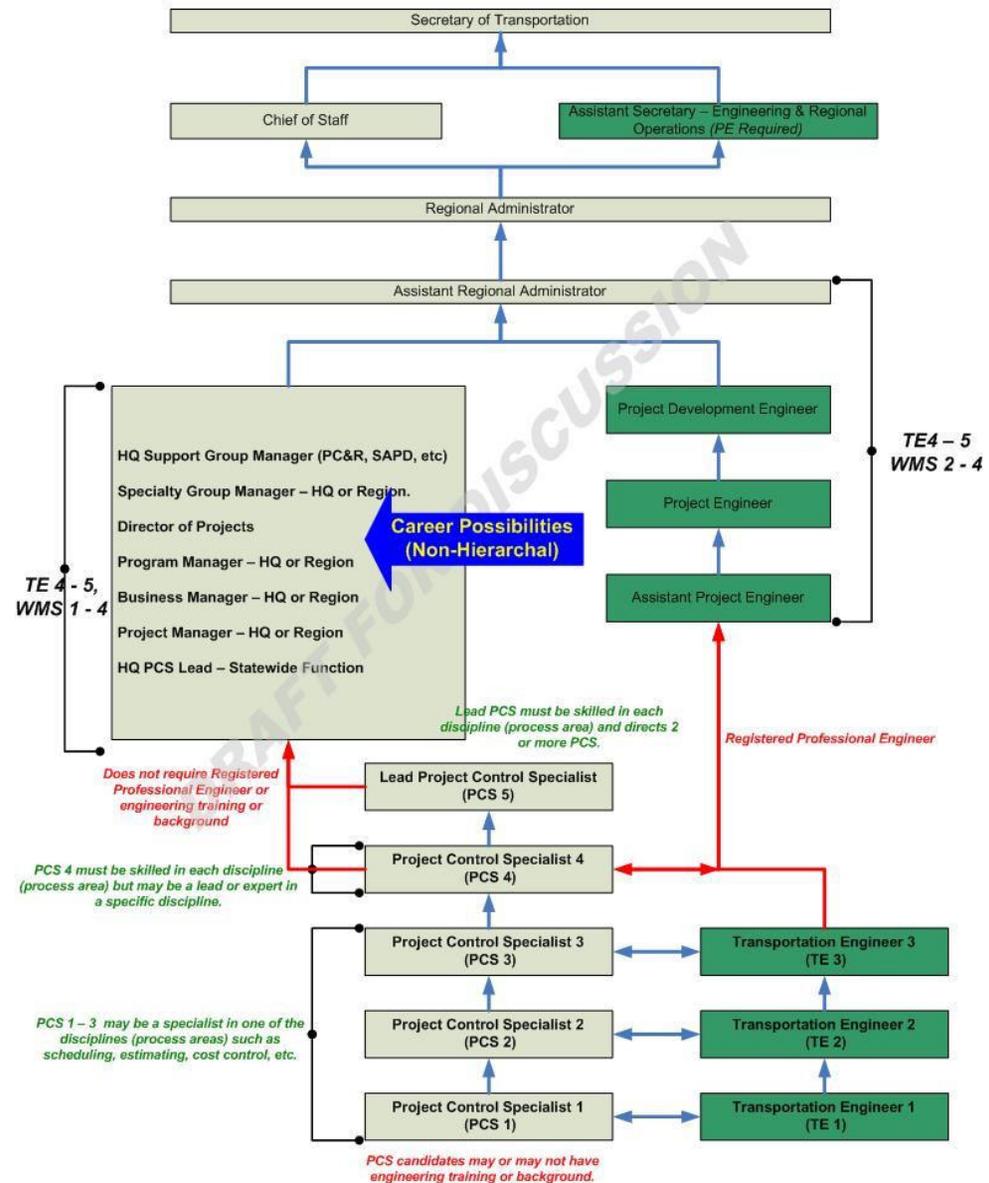


Figure 3 – Proposed WSDOT Project Controls Specialist Career Path

The **Lead Project Control Specialist** would function as the Project Controls manager for the unit. This position would typically report to the Regional Manager of Projects. The position should be filled by a highly skilled resource. Typically, it is an individual with an engineering or construction management degree with at least 15 years of progressive experience in project management or project controls. The position requires good leadership and communication skills along with detailed expertise with PMRS tools and processes. The position does not require a professional engineering registration, though this would be a desirable qualification. Some of the best Project Controls Specialists come up through the ranks from a construction management or related career path where an engineering license is not a requirement. The career path shown in Figure 3 illustrates possible individual mobility between design and construction into project controls and advancement of his or her career within the department.

In other public agencies and in private industry, the pay level for this position can easily exceed \$100k per year for very skilled candidates. The career path and typical position titles shown in Figure 3 were derived from SPMG industry experience and can be represented locally based on the project controls organization for King County’s Wastewater Treatment Division (WTD), as well as current WSDOT job postings for project controls professionals. The WTD organization was selected for discussion because it is a well established and mature organization that has been in place since the mid-1980s and performs large and small public works projects, is union represented, and deals with project issues similar to those facing WSDOT. Additionally, public organizations like this one, rather than the private sector, will most likely be competing with WSDOT for skilled project controls professionals.

WSDOT Staff Additions to Support Sustainability of PMRS Tools

The implementation of best project management processes and tools requires WSDOT to add additional staff or reorganize existing staff. The current PMRS schedule requires that this additional staff be in place at the start of PMRS tools training for each region. The recommendation is that WSDOT staff be in place at least 60 days prior to the start of training to become familiar with agency and regional issues, and to participate in pre-deployment planning activities. Table 4 shows the dates incorporated into this recommendation. Some delivery units have already placed project controls staff in advance of the planned deployment dates, though their skills must be assessed in terms of being able to provide the specialized expertise needed to fully use the PMRS tools.

Table 4 – Mobilization Target Dates for WSDOT Regional PC Staff Additions

Order of Deployment	Region	WSDOT Staff in Place
1	North Central	June 20, 2008
2	South Central	July 11, 2008
3	Olympic/Headquarters/Rail	August 22, 2008
4	Southwest	November 14, 2008
5	Northwest – SnoKing	December 30, 2008

Order of Deployment	Region	WSDOT Staff in Place
6	Northwest – Mount Baker	January 13, 2009
7	Northwest – I-5 Everett HOV	January 20, 2009
8	Urban Corridors Office	March 10, 2009
9	Eastern	April 24, 2009
10	Washington State Ferries	May 29, 2009

CLOSING GAPS IN BASIC PROJECT MANAGEMENT PREREQUISITE SKILLS

Filling Current Needs

The Tier 2 and 3 staff being hired in the regions are, for the most part, less experienced individuals being elevated to the new positions. The SPMG initial transition and sustainability plan called for highly experienced SPMG staff to be used to bring less experienced WSDOT staff up-to-speed with the new processes and tools. Filling the positions internally with less experienced staff will likely reduce the ability of SPMG to transition to WSDOT efficiently. Additional training will be required to bring the less experienced Tier 2 and 3 staff up-to-speed, in addition to the WSDOT project staff. Less experience will likely equate to lower levels of support for the tools. This issue was first addressed in November 2007, when SPMG recommended to the Steering Team the need to assess staff capabilities regarding the prerequisite project management skills training, if any, for the upcoming PMRS tools/process training and deployment. SPMG staff developed a list of minimum skills, knowledge, and/or experience for each tool that WSDOT staff would need to have to maximize the benefit from the tools/process training, and to improve the successful outcome of the implementation as a whole (Table 5). Along with the prerequisite skill, the training resource(s) available to WSDOT staff to satisfy the requirements is included.

Table 5 - PMRS Proposed Prerequisite Skills for Primavera Tools/Process Training

Discipline (Tool)	Minimum Prerequisite Skills	Training Resource(s)
Scheduling <i>(Primavera Scheduler & Web Access)</i>	<p><i>Basic understanding of:</i></p> <ul style="list-style-type: none"> ▪ Work breakdown structures ▪ Project planning ▪ Critical path ▪ Activities ▪ Milestones ▪ Activity durations ▪ Activity relationships 	<p>Introduction to Project Scheduling (WSDOT – CB5)</p> <p style="text-align: center;"><i>OR</i></p> <p>Other regional provided training content that satisfies the minimum prerequisite skills for this tool.</p>

Discipline (Tool)	Minimum Prerequisite Skills	Training Resource(s)
	<ul style="list-style-type: none"> ▪ Resources management ▪ Forward/backward pass ▪ Constraints ▪ Schedule float ▪ Gantt charts ▪ Master Deliverables List (MDL) ▪ Baselines ▪ Precedence Diagram Method (PDM) ▪ Schedule progress ▪ Percent complete ▪ Schedule reporting 	
<p>Contract Management <i>(Primavera - Contracts)</i></p>	<p>Basic understanding of:</p> <ul style="list-style-type: none"> ▪ Work breakdown structures ▪ WSDOT project management and delivery process ▪ WSDOT change management process ▪ Internal WSDOT agreements ▪ External consultant and construction agreements ▪ WSDOT consultant contract administration ▪ WSDOT construction contract administration 	<p>Project Management Process (WSDOT – B71) –</p> <p>OR</p> <p>Other regional provided training content that satisfies the minimum prerequisite skills for this tool.</p>

This analysis relates to Primavera Scheduler, Web PM and Primavera Contracts only. A separate analysis should be prepared for the Primavera Cost tool.

Regional Skills Analysis

Each region was encouraged to complete the following analysis prior to the start of deployment for their region:

1. Identify staff that will be participating in the PMRS tools/process training for Primavera Scheduler, Web PM and Contracts
2. Evaluate the skills, knowledge, and experience of these participants relative to the minimum prerequisite skills for each tool and confirm which staff members meet the criteria
3. Arrange for remaining staff to participate in training to acquire the minimum prerequisite skills prior to the tool’s deployment for the region.

Recommendation to Expand and Refine Basic Skills Training

In the fall of 2007, SPMG advised the Steering Team and the EOC of a pending issue regarding skills training. Based on feedback received from WSDOT during the May 2008 Primavera Scheduler pilot class, the skills gap risk identified last fall continues to be an issue. The pilot class participants confirmed that it was readily apparent that the majority of WSDOT staff who will be responsible for hands on, day-to-day scheduling does not have basic PM skills. Therefore, we recommend that all PMRS end user staff should have taken the Managing Project Delivery basic PM class beforehand. The discussion in the pilot class is that this course is not regularly offered due to training resource constraints. This need must be addressed and corrected. The training should also include refined content aimed at helping staff transition from MDL-focused scheduling to WBS-focused scheduling. Users need to understand what the differences are between the two approaches and the benefits of the new tools. If this is not addressed prior to PMRS deployment, SPMG believes that the department will incur resistance to implementation; thus, this needs to be addressed now since deployment starts in August. Specifically, we advised the department in the fall of 2007 to proceed as follows:

- Identify WSDOT's Project Control capabilities for each region with and without consultants
- Develop a plan to get all regions on a level playing field including training needs and tool deployment
- Roll out the PMRS tools first to either the least complex region or the most proficient region or projects for early PMRS win
- Include refresher courses in training materials as well as advanced training prior to deployment of the PMRS.

WSDOT Project Management (PMN) and Project Controls (PCN) Networks

KNOWLEDGE SHARING

In addition to the implementation of the PMRS tools, a key component to capital project delivery is WSDOT's ability to sustain and improve its Project Management and Project Controls staff capabilities, and to promote a culture that supports ongoing enhancement in both of these areas. Over the past year, several WSDOT project delivery staff has attended Project Management Academy sessions. PMRS skills and tools training begins in the summer of 2008 and will continue over the next year as the PMRS tools are deployed. In order to maximize the return of this significant investment in staff capabilities and to promote a project management culture, WSDOT should consider the development of Project Management and Project Controls Networks.

Project Management and Project Controls Networks are intended to provide a statewide forum for sharing information among practicing Project Managers, Project Control Specialists, and other staff in similar positions supporting capital project delivery. Industry examples include "Communities of Practice"⁶ and "Practice Area Networks"¹² that serve as "virtual water coolers" for sharing skills and knowledge that enable individuals to grow in the profession. The PMN and PCN also serve as vehicles to support long-term sustainability of the associated skills and systems. These networks efficiently encourage the transfer of information in large

organizations in an informal and self-perpetuating manner. Membership is typically voluntary and made up of individuals with similar backgrounds that seek to develop new or advanced technical skills and business knowledge.

BENEFITS OF PRACTICE NETWORKS

The benefits of these networks include:

- ✓ Exchanging experience and lessons learned from other WSDOT projects and/or regions
- ✓ Generating an inventory of skills and experience that could be used as a resource for staff in the Project Management and Project Control disciplines
- ✓ Coordinating work activities on similar efforts to leverage work being done by others
- ✓ Serving as a resource for others doing similar work to help tap into skills and resources not readily available in a particular region
- ✓ Helping advance WSDOT's overall skill level in the project management and project control disciplines
- ✓ Leveraging training opportunities by allowing staff to benefit from training conducted in other regions
- ✓ Assisting with career path identification, mentoring, and advancement
- ✓ Celebrating and sharing success stories
- ✓ Providing support on project management tools
- ✓ Serving as a project management and project controls skills workshop
- ✓ Addressing issues related to both design and construction phases
- ✓ Providing an informal and safe forum to share information and exchange ideas
- ✓ Promoting statewide consistency in the project delivery
- ✓ Maximizing value added to capital project delivery.

Typical mechanisms that are available for sharing this information include:

- Newsletters
- E-mails (via Microsoft Outlook group)
- WSDOT Intranet Web Site
- Regular Teleconferences or Go-To Meetings
- Videoconferencing
- Quarterly Meetings
- Annual workshops or technical exchange seminars
- Professional papers competition
- Project of the Year awards and recognition

- Special Interest Groups associated with professional or technical societies including Web Forums or “External Listserves”.

ORGANIZING USING PMN AND PCN COORDINATORS

To be effective, a strong coordinating committee should be formed supported by a designated coordinator to determine what types of information would be beneficial to the members and how to efficiently communicate this information. The members of the networks must play an active role to maximize the benefit of this effort. Promoting feedback to generate and sustain two-way communication is crucial. Coordinators are advised to ensure that the group operates efficiently and maximizes the potential benefit to its members. The roles and responsibilities of the coordinators should be as follows:

- ✓ **Establish a strong coordinating committee** – The coordinators should organize the group’s activities. Generally three to six people from the group would make up the committee. These individuals represent different functional groups or geographical areas of WSDOT. Ideally, they will be familiar with WSDOT’s project delivery processes. The goal is to find people that are energetic, enthusiastic, organized, good communicators, and facilitators.
- ✓ **Respond to queries about the networks** – Group coordinators may respond to questions for advice and assistance about the technical aspects of the specialty area that may benefit projects. Ideally, coordinators will provide timely responses to issues or forward the question to the appropriate members for response.
- ✓ **Develop network strategy** – As a leader of the PMN or PCN, help identify the strategic technical needs and propose solutions to fill those needs. Some examples are as follows:
 - How can WSDOT keep pace with developments in the industry?
 - Are there new standards or regulations that affect the way we work?
 - What technical training does our staff need in order to continue to be effective?
 - Are there gaps in our pool of talent? Does WSDOT need to hire people with certain skills?
- ✓ **Play a role in career development of network group members** – PMN and PCN members can be another link in making the employees feel like they are a part of WSDOT. PCN efforts should complement the efforts of the individual’s manager, supervisor, or project manager, and positively impact capital project delivery. The PMN and PCN can also play a major role for staff in offices where there are very few people in a similar discipline or practice area. Listed below are some suggestions regarding career development:
 - Encourage participation in WSDOT programs and awards
 - Encourage participation in outside professional organizations
 - Implement mentoring programs
 - Assist in career path planning
 - Promote project management and project controls training such as:

- PM Academy
- WSDOT training courses
- Association certifications

PROJECT MANAGEMENT PROCESSES, CONTROL, AND REPORTING SYSTEMS

Problems

- Success is achieved when the scope of work is completed on schedule, within budget, and meets quality standards; achieving this with the agency's current set of tools and practices is a challenge in some cases
- There is presently a lack of a systematic and consistent approach in the accumulation, management, and reporting of project-related data
- Outdated and disjointed management practices and systems are inconsistently applied throughout WSDOT
- Systems don't have the scalable capacity to report program status effectively.

Besides meeting external reporting expectations, WSDOT requires systems and tools which have the capacity, flexibility, and scalability to effectively manage a 300% increase in work effort. The shortcomings of existing systems have been documented by JLARC, summarized at the right.

"As noted in previous reviews, WSDOT's information systems are too old and outdated to adjust rapidly to new or revised performance reporting expectations."

JLARC Accountability Report, August 2, 2005

Proposed Phase 1 Solutions

- ✓ Implement BMP's methods and computerized tools to enable WSDOT to anticipate changes and manage them proactively
- ✓ Improve the efficiency of project delivery and create a set of standard operating procedures to facilitate the use of BMPs and allow for effective project controls and reporting tools
- ✓ Provide a consistent status reporting environment throughout WSDOT by implementing recommended new applications and reporting styles
- ✓ Procure commercial off-the-shelf software packages that can be integrated into WSDOT's current approach to data management, and enhanced to provide web-based access for multi-level reporting and improvement of business workflows to implement modern Project Control and Reporting tools to improve Project Management reports
- ✓ Implement Earned Value Cost Management processes and tools immediately on major and moderate sized projects
- ✓ Develop prescriptive reporting requirements to provide uniform reporting of budget and schedule status

- ✓ Supplement and advance current WSDOT PM training courses geared toward existing processes and practices to include training in the proper use of the advanced tools and reports
- ✓ Implement a PM Academy for PM certification and training
- ✓ Adopt forward-looking management tools and practices
- ✓ Focus on efficient operations and communications including:
 - Top-to-bottom communications
 - Increased accountability
 - Modernized tools and techniques
 - Information sharing
 - More value for operating and construction costs
- ✓ Recognize and manage cultural changes throughout.

Changes in the processes and procedures will be “hand-in-glove” with changes in the information and project management tools or systems.

Refinements to Project Management Processes, Control and Reporting Systems

BMPs SUMMARY

Appendix 2 summarizes the progress made and activities planned in implementing Phase 1 BMPs recommendations as of June 2008. The appendix identifies over 100 separate activities that, when completed, represent the successful implementation of the Phase 1 BMPs. Key accomplishments related to the implementation of BMPs include:

- ✓ Development of business process maps for WSDOT project delivery processes related to schedule development and maintenance, agreement management, cost control, earned value, change management and construction cost estimating
- ✓ Procured industry standard software in the areas of schedule, cost, contract administration, and document control/content management for use in PMRS
- ✓ Completed design of the scheduling system and reviewed with WSDOT to ensure that initial business needs were satisfied
- ✓ Developed the WSDOT Enterprise Project Structure (EPS)/Work Breakdown Structure (WBS) and modified the MDL and Work Operation Codes to incorporate them into the EPS/WBS
- ✓ Established a statewide WSDOT PMRS Policy Group that has:
 - Revised the existing project management Executive Order to strengthen project manager accountability
 - Developed an Executive Order specifying requirements for the use of PMRS

- Developed procedures for schedule development and maintenance, agreement management, cost control, earned value, change management, and construction cost estimating
- Drafted PMRS guidance documents to assist WSDOT staff in effectively applying best management practices
- ✓ Conducted Project Management Academy training for 240 participants
- ✓ Conducted a regional inventory of project management plan (PMP) development and use and began implementing recommended improvements
- ✓ Drafted standard WSDOT reports for external report for Executive review and approval
- ✓ Began development of training material scheduling tools training.

To date, 89% of more than 100 separate activities have been completed or are underway as of the end of the first two years of the Phase 2 work program. The summary in Appendix 2 is supported by a detailed review of specific Phase 1 recommendations proposed for each best management category. The majority of incomplete activities are related to the on-going deployment of PMRS, including its associated training.

INDEPENDENT REGIONAL PROJECT MANAGEMENT REVIEWS

WSDOT's HQ Construction Office maintains a program for capturing and sharing "lessons learned" on project delivery. The Lessons Learned System is an internal business process supported by a database system that captures project experiences for use in the future to solve recurring issues or to disseminate creative techniques of risk resolution. The goal of the Lessons Learned System is not to simply have a computer database that stores information; the database is only a tool to support the sharing and communicating of what works and what does not for the purpose of improvement. The term "**lessons learned**" is defined as "**knowledge gained from experience, successful or otherwise, for the purpose of improving future performance**" (Construction Industry Institute, 1997). Lessons are learned everyday through our experiences. Capturing and effectively sharing these lessons builds a knowledge base that the department can use on future project endeavor.¹³

Lessons Learned:

"Experience is what you get when you don't get what you want."

Dan Stanford – ladyquote.com – June 2008

The practice of independent peer reviews of project management functions is a pro-active extension of this knowledge transfer technique. This industry practice is directed at assessing the status of project management and oversight functions performed by the project team. It is an internal advisory function generally accomplished during the ramp-up stage as the project nears the 30-35% complete milestone. Senior and experienced peer-level project management and project controls specialists form a review team to meet with key project participants that provides the project manager with a second set of experienced eyes to anticipate

and guide the project through management challenges that so often can be avoided based on the lessons learned from previous projects. The recommendations of the Independent Peer Review team are compiled into a confidential plan that is offered to the project manager as a corrective action plan to help avoid problems early on in the project. SPMG recommends that the department initiate such a practice at the regional level on a trial basis to assess the validity of this practice against current programs. Appendix 3 presents draft guidance on a policy and procedure statement that the department can use to initiate the development of this pilot.

PMRS IMPLEMENTATION REFINEMENTS

The SPMG Phase 1 Strategic Plan performed an analysis that identified key areas of improvement in the agency's delivery methods to meet the needs of the rapidly expanding capital construction program. The overall objectives of PMRS are to provide WSDOT with the tools, business processes, and training to deliver construction projects on-time, on-budget, and within scope, and to establish accountability. These tools will leverage management information to provide informed decision making and efficient reporting. The tools comprise the Project Management and Reporting System.

The Strategic Plan set forth a vision statement that guides these improvements. This vision statement was incorporated into the Phase 2 PMRS work plan and resulted in the establishment of overarching PMRS objectives aligned with the following four primary goals:

1. Define, implement, and train WSDOT staff on industry-leading project management business processes
2. Define, implement, and train WSDOT staff on industry-leading project management software to manage scope, schedule, cost, and associated information
3. Provide mentoring, support, and cross-organizational communication needed to implement the processes and tools required to support industry-leading project management business practices
4. Provide roll-up reporting needed to support program management at all levels within WSDOT (project portfolio management), and to meet external reporting requirements for accountability regarding on-time/on-budget project delivery.

PMRS Vision:

The PMRS will provide WSDOT managers with better tools to assist them in making effective and efficient business decisions based on management of project scope, schedule and cost. Project information will be easily accessible, transparent, consistent and accurate and will enable improved forecasting and proactive problem resolution.

SPMG Phase 1 Strategic plan, June 2006

Appendix 4 presents the mapping of the relationships of these goals to the next level of detail (objectives), defining the expected benefits that will drive the PMRS business process strategies, tactics, and design as related to policies, procedures, and implementation steps to assure that the PMRS provides the needed functionality to implement and support the desired goals and objectives to achieve the expected benefits.

PMRS Expected Benefits

- Project Delivery – improved business processes – project managers assume continuous ownership for project delivery and reporting
- Implements earned value and cost-at-completion
- Improved change control processes
- Reporting becomes a by-product of system use (not the primary purpose of the system).

Accountability - increased accuracy and efficiency

- More effective and efficient comparisons of current/baseline schedules and costs
- Bring management activities “on-line”
- Able to easily view summarized program information
- Web portal provides “one-stop” information retrieval for project managers
- Integrated systems feed each other (less redundant data entry).

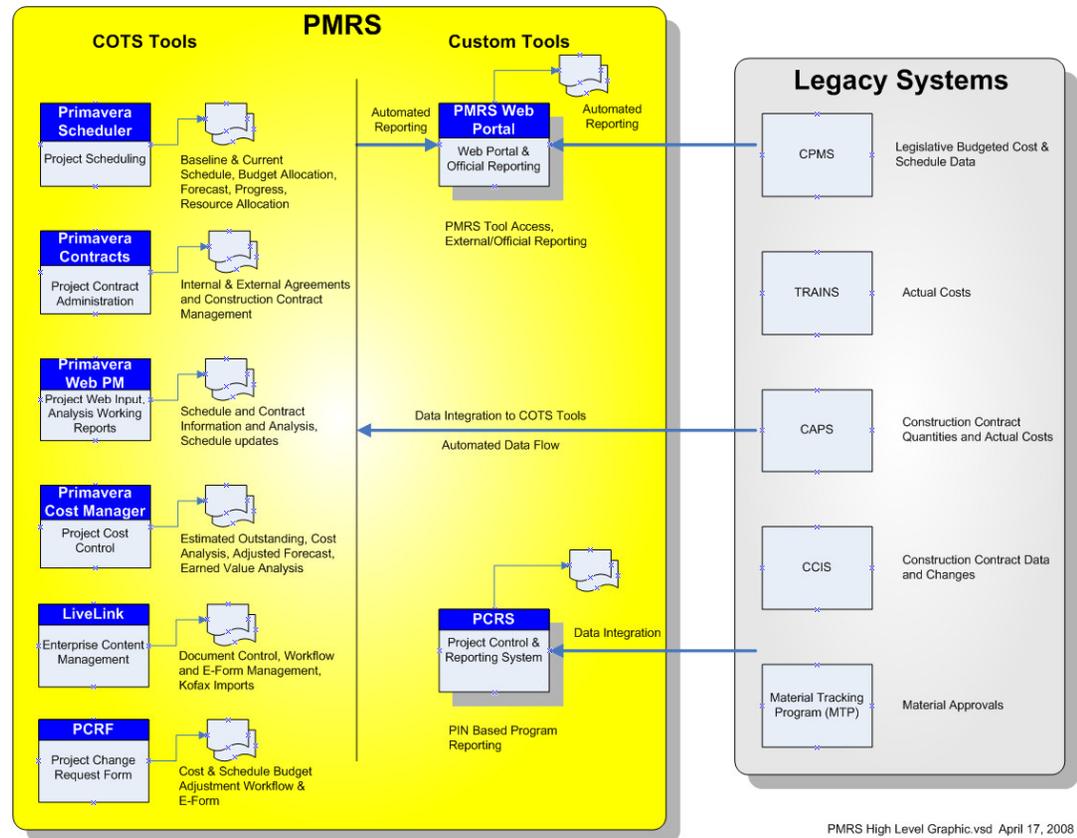
MAJOR COMPONENTS OF PMRS

The core functionality intended from the Phase 1 Strategic Plan remains the same as Phase 2 work progresses. The configuration of the system is shown conceptually in Figure 4 on the following page. The configuration shown in Figure 4 has been refined to match up with the integration details of WSDOT’s legacy systems based on the specific features of each software package. This configuration is being implementing by the PMRS team that includes OIT, SPMG, and other software and project controls specialists.

The following software packages have been selected based on providing specific project management functions, as well as integrating with existing legacy systems:

- Scheduling
 - Primavera Scheduler
 - Primavera Web PM
- Cost control and earned value
 - Primavera Cost
- Project Content Management (Project ECM) and document control
 - Livelink
 - Kofax
- Web portal for reporting
- Integration with existing legacy systems including:
 - CPMS (Capital Program Management System)
 - TRAINS (Transportation Reporting and Accounting Information System)
 - CAPS (Construction Accounting Payment System)
 - CCIS (Construction Contract Information System).

Project Management & Reporting System Tools



PMRS High Level Graphic.vsd April 17, 2008

Figure 4 – PMRS Components

PMRS SCHEDULE ACCOMPLISHMENTS

The current schedule has been refined to a level of detail that clearly identifies the needed tasks and the managers responsible for performing the work. Figure 5 shows conceptually the overall development schedule. The actual project working schedule is composed of over 2,000 individual activities. The various software packages are being integrated into PMRS and deployed in stages so the agency can benefit from early use of important components without having to wait for full integration to be completed. Current target dates for the individual component deployments are shown in Figure 5. Major near-term milestones are the July '08 deployment of the Project ECM, the August '08 deployment of the scheduling tools, and the October '08 deployment of the contract management tool.

The current schedule calls for completion of the integration and full deployment by June 2010. This represents a refined work program resulting from the resolution of a great number of risks and unknowns since the project was originally proposed in Phase 1.

Content Management (Project ECM)

Acquire Software	Configure Software	Pilot Deployment	Develop Training	Test/Approve Design	Train Users	Starts July '08 Deploy to Agency
						We are here

Primavera Scheduler / Web Access

Acquire Software	Configure Software	Pilot Deployment	Develop Training	Test/Approve Design	Train Users	Starts August '08 Deploy to Agency
						We are here

Primavera Contracts

Acquire Software	Configure Software	Pilot Deployment	Develop Training	Test/Approve Design	Train Users	Starts October '08 Deploy to Agency
						We are here

Primavera Cost

Select/Acquire Software	Configure Software	Pilot Deployment	Develop Training	Test/Approve Design	Train Users	TBD Deploy to Agency
						We are here

Full
Deployment
Of
Integrated
System
June '10

Figure 5 – PMRS Schedule Status – June 2008

Significant progress has been made on the design and implementation of the PMRS. Since the completion of the Phase 1 Plan, WSDOT has received funding approval for the project from the legislature, obtained concurrence from the Information Services Board (ISB) to proceed with the project, and achieved the following major milestones in the development and deployment of the system and its individual components:

Initial Phase 2 Successes

- ✓ Established the agency vision and direction of the PMRS
- ✓ Refined Strategic Plan deployment approach for stepped release of software in a stand-alone environment
- ✓ Project initiation approved by ISB
- ✓ Developed consistent business process maps for project and content management
- ✓ Successfully selected and contracted with four vendors to provide Commercial Off-the-Shelf (COTS) software for the PMRS.
- ✓ Acquired and installed hardware for PMRS components
- ✓ Established agreement with the Office of Information Technology (OIT) to have them provide system integration services to facilitate compliance with WSDOT's Enterprise Architecture
- ✓ Conducted regional meetings to gather user requirements for the PMRS components
- ✓ Issued user requirements
- ✓ Revised the deployment plan to accelerate agency-wide use and move integration of individual components earlier in the schedule
- ✓ Designed and deployed an upgraded project database system for consistent quarterly reporting (Project Control & Reporting System - PCRS).

Recent Successes

Scheduling

- ✓ Completed scheduling specifications
- ✓ Developed a draft scheduling configuration plan
- ✓ Implemented the scheduling configuration in Primavera Scheduler
- ✓ Completed design and began implementation of automated interfaces for Primavera Scheduler
- ✓ Developed a draft training manual for Primavera Scheduler that incorporates WSDOT processes
- ✓ Finalized the scheduling configuration plan as a result of the design review conference comments
- ✓ Completed the integration development for data transfer from CPMS to Primavera Scheduler
- ✓ Completed the integration design for data transfer from TRAINS to Primavera Scheduler.

Contract Administration

- ✓ Established a construction pilot for use of Inspector Daily Reports (IDR) and associated information using Primavera Contracts.

Project Electronic Content Management – Project ECM

- ✓ Completed the pilot deployment for Real Estate and Right-of-Way in the Alaskan Way Viaduct and Eastern Region offices – now ready for agency-wide deployment
- ✓ Established pilots for Environmental in the Alaskan Way Viaduct and South Central offices
- ✓ Established pilots for Public Involvement in the Alaskan Way Viaduct and Eastern Region offices.

Workflows

- ✓ Completed prototype of Project Change Request Form (PCRF) and initiated beta testing in the Northwest Region
- ✓ Completed prototype of Inspector Daily Report (IDR) offline form.

Policies & Procedures

- ✓ Developed PMRS related policies and received approval to issue
- ✓ Developed detailed procedures to accompany the previously developed process maps.

Web Portal and Reporting

- ✓ Completed initial development of PMRS Web Portal
- ✓ Completed initial development of legacy system reports to be utilized through the PMRS Web Portal.

PMRS BUDGET REFINEMENTS

The original Phase 1 PMRS budget was \$13.4 million. As the project went through the approval stage with the Information Services Board (ISB), certain requirements and refinements were added that increased the approved budget to the current \$17.3 million.

The following significant changes have occurred to the project since its initial ISB approval:

- The ISB required that the integration work be done by a third party; this 3rd Party Integrator scope added an estimated \$550,000
- Addition of External Quality Assurance (\$100,000); this was added as a result of the ISB determining this project to be a Category 3 and requiring external quality assurance
- Addition of 5% Management Reserve (\$665,929)

- Transfer of Project Management (PM) costs from Tier 1 to the PMRS System Development effort (\$1,286,808); PM costs were previously accounted for as part of the Tier 1 budget and have been transferred into the PMRS project to account for them as part of the overall cost of implementation
- Revised 3rd Party Integrator estimate to account for increase in cost expected due to complexity of the project and architectural requirements to match the new enterprise architecture proposed by OIT and Symantec Arts (\$450,000)
- Increased software license costs to reflect the expected expenditures resulting from the recent product selections (\$800,000)
- Internal changes for stepped deployment reallocating costs between categories – no net affect (\$0)

The changes identified above have increased the projected project costs by \$3,851,000, of which \$1,286,808 was a transfer from another funding source that was not previously identified in the project budget. These changes were presented to the EOC and have been approved by the Director of Project Control and Reporting and the SPMG Executive Policy Group. The total projected cost based upon the original budget and the changes identified is \$17,252,000. The approved legislative budget is \$17,252,000. Table 6 presents the current approved budget.

Table 6 – PMRS Expenditure Plan and Approved Budget

Project Management and Reporting System (PMRS) Biennial Budget				
	<i>2005-2007</i>	<i>2007-2009</i>	<i>2009-2011</i>	<i>Total</i>
Project Total	\$4,059,000	\$12,229,550	\$963,450	\$17,252,000

COMMUNICATIONS MANAGEMENT

Management of wide-spread WSDOT expectations has been a challenge. Issues addressed in Phase 1 and throughout portions of Phase 2 are still surfacing in the regions. This illustrates a lack of comprehensive or ineffective project communications. Current methods include:

- ✓ Publishing quarterly folios
- ✓ Obtaining direction from and providing information to the EOC and the Steering Committee
- ✓ Bi-weekly Tier 2/3 meetings
- ✓ Presentations at state-wide conferences
- ✓ Posting current and relevant information to the SPMG website
- ✓ Individual meetings with end users.

When these are all combined, the conclusion remains that this approach does not appear to reach enough of the organization. SPMG has established a communications and cultural change section in the project schedule and have staff dedicated to it, but

internally concerns remain that we are not getting the right message out in the right way. Perhaps it is a perception that the PMRS is a “silver bullet” tool that will solve all project management and reporting problems at the department—SPMG recognizes that this isn’t the case. While focusing on *how* the tools are configured and what the tools are going to do, perhaps we have under emphasized the message as to *why* the department is seeking change and how the new way of managing will help the regions do their job. Thus, SPMG recommends the following improvements to the communications messages:

- Emphasize that changes are refinements to WSDOT business processes and the tools are supporting these refinements; don’t focus solely on the tools as the “silver bullet,” because it isn’t
- Use language like “enhance” the way people do their work rather than “change” the way people do their work
- Use graphics to help communicate this theme
- Develop typical user profiles to help target communications to key users
- Stress these themes in the deployment training
- Constantly communicate realistic expectations of the PMRS with WSDOT users
- Continue to use folios and newsletters to communicate with WSDOT users
- Continue to refine the PMRS WSDOT Transition and Sustainability Plan and stress its importance since this is a key element in the overall success.

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APPENDIX 1 – KEY PROJECT MANAGEMENT OFFICE POSITION DESCRIPTIONS

Adapted from Crawford, J. K., *Seven Steps to Strategy Execution*⁷
An NWR pilot project organizational analysis.

DIRECTOR OF PROJECTS

Job Objectives

✓ **Lead and Oversee Organization in:**

- State-wide direction and oversight of all WSDOT programs and projects under development and execution
- Data integration and reporting for all projects and programs
- Development and management of the state project management office (PMO)
- Implementation of processes and tools to increase project management effectiveness
- Development and deployment of enterprise project management and project controls tools, best management practices, and systems so as to facilitate state-wide project and program management delivery and reporting
- Development and diffusion of project management culture within the department
- Identification of the need for business process improvements and works with internal groups and divisions to effectively drive change throughout the organization.

Knowledge and Skills required

✓ **Knowledge:**

- Principles of effective leadership, supervision, and administration of rapidly developing project management and controls staff to meet the challenges of delivering the state's large capital program
- Ability to analyze and synthesize information in a concise manner to make recommendations on strategies to resolve policy and political issues
- Demonstrates management capability to analyze and solve complex problems in a creative and effective manner.
- High level knowledge in portfolio/project management
- Strong knowledge of finance and accounting as well as project delivery
- High level knowledge in critical path project scheduling
- High level knowledge of cost management and project recovery planning
- Project Management practices and principles as set forth in the Project Management Book of Knowledge (PMBOK)
- Knowledge of cost estimating practices and system implementation
- Working knowledge of project management and cost estimating software

- Knowledge of business analysis and reporting techniques
- Development, tracking, and reporting of performance measures, targets, and goals with which to assess project and program delivery.

✓ **Skills:**

- Skilled in managing and building Project Management systems in large capital intensive organization
- Strong partnering and team-building skills
- Excellent written and oral communication skills
- Effective skills in teaching and mentoring technical staff
- Skilled in working in large matrix structured organization
- Skilled in “hands on” project management—preferably in large capital intensive organizations.

Nature and Scope

This position is a leadership and management position which will be responsible for leading and overseeing the development and implementation of mission critical project management practices and systems state-wide in all regions and modes. The position will have a primary role in developing and implementing strategies that improve and solidify the delivery of a multi-billion dollar capital program.

Background, Experience, and Education

- Extensive experience (10+ years) in the management of large and complex projects or programs
- Strong experience (5-7 years) in project control and reporting, design and construction management.
- Certification as PMP or equivalent experience
- Licensed as Professional Engineer, or Certified as Project Management Professional, or Advanced Business, Public Administration, Construction Management, or Planning Degree is desirable
- Experience with relevant enterprise project management and financial systems
- Experience with working with external agencies, vendors, consultants, and Project Control software suppliers.

REGIONAL MANAGER OF PROJECTS

Job Objectives:

✓ **Lead and Oversee Organization in:**

- Interface between area or Project Engineering Office (PEO) project delivery and regional Program Management
 - Provides strategic input and advice on the portfolio of projects and PM processes in the region
 - Provides development of PM competency through training and other personnel development activities
 - Working with the Assistant Regional Administrators (ARAs) and the regional leadership team, to effectively drive needed changes into the region to deliver projects successfully
 - Works with the PMO to implement best management practices, tools, methods and procedures
 - Ensure consistency in practices vertically in the Region through each Project Office and horizontally in the Region through PE Offices
 - Communicate Project Management issues to ARAs as received from the PMO
 - Develops Project Management, Delivery Strategies, Standards and Procedures, and Methods that result in improved capital project delivery in the region
 - Integrate Standards and Best PM practices; including QA/QC, Cost Estimating, Value Engineering, Cost Risk Assessment, and Scheduling.
- Involvement of construction offices early in design process, and continuation of design offices in construction—particularly for larger projects
- Auditing, Quality Assessment, and Independent Project Management Peer Reviews
- Formal staff training on Best Practices in Project Management
- Developing and maintaining Critical Path Schedules for all projects in the region
- Preparing Accurate Construction and Engineering Cost Estimates
- Developing financial and other status reports for working groups and project teams
- Development and use of Workforce Planning Tools
- Implementation of Project Management technical systems
- Implementation of Earned Value (in advance of SPMG systems)
- Provides assistance to PMs in project recovery planning, negotiations, and settlement of claims.

Knowledge and Skills required

✓ **Knowledge:**

- Principles of effective leadership, supervision, and administration of rapidly developing project management and controls staff to meet the challenges of delivering region or mode's large capital program
- High level knowledge in portfolio/project management
- High level knowledge in critical path project scheduling
- High level knowledge of Earned Value Management
- Project Management practices and principles as set forth in the Project Management Book of Knowledge (PMBOK)
- Knowledge of cost estimating practices and system implementation
- Working knowledge of project management and cost estimating software
- Knowledge of business analysis and reporting techniques
- Development, tracking, and reporting of performance measures, targets, and goals with which to assess project and program delivery.

✓ **Skills:**

- Skilled in building and managing Project Management systems in large capital-intensive organization
- Excellent written and oral communication skills
- Effective skills in teaching and mentoring technical staff
- Skilled in working in large matrix structured organization
- Skilled in "hands on" project management—preferably in large capital-intensive organizations
- Ability to lead implementation of technical systems while not necessarily having a profound working knowledge of those systems
- Ability to synthesize and build cross-checks and balances into project delivery systems in order to minimize and eliminate costly errors.

Nature and Scope

This position is a leadership and management position which will be responsible for leading and overseeing the development and implementation of mission critical project management practices and systems in the region. The position will have a primary role of developing and implementing strategies that improve and solidify the delivery of a multi-billion dollar capital program. This position is key, as it will provide interface throughout the organization – from oversight and mentoring of TE3 schedulers and project control specialists, to Project Managers, Project Engineers, and Engineering Managers. The person in this position is a

key figure responsible for strategies and tactics for project delivery and accountability; as the actions recommended by this position will impact regional or modal capital project delivery.

Background, Experience, and Education

- College degree in engineering or related field plus 5-10 years experience with design and/or construction of transportation projects
- Experience in the management of large and complex projects or programs desirable
- Experience (5+ years) in project control and reporting, design, and construction management
- Licensed as Professional Engineer, or Certified as Project Management Professional, or Advanced Business, Public Administration, Construction Management, or Planning Degree is desirable
- Previous experience in working with mid- and senior level managers and executives
- Experience with working with external agencies, vendors, and consultants and Project Control software suppliers.

APPENDIX 2 – BMPS ACTION PLAN SUMMARY

Items shown in **bold green** have changed since the last update in March 2008.

BMP Category	Completed Phase 2 Activities	Ongoing Activities	Planned Activities
Project Management Plan	<ul style="list-style-type: none"> ✓ Began work with Rail group to prepare PMPs for active projects ✓ Began limited review of PMP completion (OR and SCR) ✓ Conducted PM Academy pilot and follow-on production sessions training for 240 participants ✓ Tier 2 staff have begun selective assessments of PMP preparation and quality ✓ Conducted regional inventories of PMP completion and develop completion/update plan and schedule 	<ul style="list-style-type: none"> • Review PMP training modules and propose improvements as necessary • Implement PMP report recommendations • Continue to provide PMP preparation training as component of overall WSDOT project management training • Form multi-region working group to resolve other PMP issues related to funding agency requirements • Continue providing PM Academy training sessions 	
Scope Management	<ul style="list-style-type: none"> ✓ Developed change/scope management business processes ✓ Procured PM software (Primavera Contracts, Primavera Scheduler and Project Web PM, Primavera Cost) ✓ Conducted PM Academy pilot and follow-on production sessions training for 240 participants ✓ Developed scope management procedures 	<ul style="list-style-type: none"> • Complete design and implementation of related PMRS elements • Develop and conduct skills training • Develop and conduct related tools and process training • Continue providing PM Academy training sessions 	<ul style="list-style-type: none"> • Fully deploy PMRS

BMP Category	Completed Phase 2 Activities	Ongoing Activities	Planned Activities
	<ul style="list-style-type: none"> ✓ and QA controls ✓ Assessed scope management training needs and materials 		
Work Breakdown Structure	<ul style="list-style-type: none"> ✓ Defined WSDOT agency wide WBS ✓ Procured PM software (Primavera Contracts, Primavera Scheduler and Primavera Web PM, Primavera Cost) ✓ Conducted PM Academy pilot sessions ✓ Resolved MDL and work on code issues ✓ Developed WBS procedures and QA controls ✓ Assessed WBS/MDL training needs and materials 	<ul style="list-style-type: none"> • Complete design and implementation of related PMRS elements • Develop and conduct WBS training • Develop and conduct related tools and process training • Continue providing PM Academy training sessions 	<ul style="list-style-type: none"> • Fully deploy PMRS
Risk Management	<ul style="list-style-type: none"> ✓ Conducted PM Academy pilot and follow-on production sessions training for 240 participants ✓ Assessed risk management training needs and materials 	<ul style="list-style-type: none"> • Refine Project Management Online Guide for risk management • Develop and conduct tools and process training • Continue providing PM Academy training sessions 	<ul style="list-style-type: none"> • Fully deploy PMRS
Cost Estimating	<ul style="list-style-type: none"> ✓ Developed estimating business processes ✓ Assessed capabilities of estimating software (WinEst) and determined the lack of 	<ul style="list-style-type: none"> • Continue providing PM Academy training sessions 	

BMP Category	Completed Phase 2 Activities	Ongoing Activities	Planned Activities
Schedule Management	<p>need to meet current requirements.</p> <ul style="list-style-type: none"> ✓ Conducted PM Academy pilot and follow-on production sessions training for 240 participants ✓ Developed cost estimating process and procedures ✓ Developed scheduling business processes ✓ Procured PM software (PRIMAVERA SCHEDULER AND PRIMAVERA WEB PM) ✓ Conducted PM Academy pilot and follow-on production sessions training for 240 participants ✓ Developed scheduling procedures and QA controls ✓ Assessed scheduling training needs and materials 	<ul style="list-style-type: none"> • Complete design and implementation of related PMRS elements • Stand-alone deployment of P6 • Develop and conduct schedule training • Develop and conduct tools and process training • Continue providing PM Academy training sessions 	<ul style="list-style-type: none"> • Fully deploy PMRS
Cost Management	<ul style="list-style-type: none"> ✓ Procured PM software (Primavera Contracts, Primavera Scheduler and Primavera Web PM, Primavera Cost) ✓ Developed cost management business processes ✓ Conducted PM Academy pilot and follow-on production sessions training for 240 	<ul style="list-style-type: none"> • Develop and conduct cost management training • Develop and conduct tools and process training • Continue providing PM Academy training sessions • Configure Primavera Cost 	<ul style="list-style-type: none"> • Fully deploy PMRS

BMP Category	Completed Phase 2 Activities	Ongoing Activities	Planned Activities
	<ul style="list-style-type: none"> ✓ participants ✓ Assessed cost management training needs and materials ✓ Evaluated cost management alternatives to Primavera Cost ✓ Developed cost management procedures and QA controls 		
Document Control	<ul style="list-style-type: none"> ✓ Procured Project ECM software (Opentext / Livelink) ✓ Developed Project ECM / document control business processes ✓ Assessed document control training needs and materials 	<ul style="list-style-type: none"> • Complete design and implementation of related PMRS elements • Develop document control procedures and QA controls • Develop and conduct document control training • Develop and conduct tools and process training • Conduct ECM Pilot Programs 	<ul style="list-style-type: none"> • Fully deploy PMRS
Earned Value Management System	<ul style="list-style-type: none"> ✓ Procured EVMS software (Primavera Cost) ✓ Developed earned value business processes ✓ Kicked off earned value initiative in the Olympic Region ✓ Conducted PM Academy pilot and follow-on production sessions training for 240 participants ✓ Assessed earned value training needs and materials ✓ Evaluated cost 	<ul style="list-style-type: none"> • Complete design and implementation of related PMRS elements • Continue providing PM Academy training sessions • Develop and conduct earned value training • Develop and conduct tools and process training 	<ul style="list-style-type: none"> • Fully deploy PMRS

BMP Category	Completed Phase 2 Activities	Ongoing Activities	Planned Activities
	<ul style="list-style-type: none"> ✓ management alternatives to Primavera Cost ✓ Developed earned value procedures and QA controls 		
Change Management	<ul style="list-style-type: none"> ✓ Procured PM software (Primavera Contracts, Primavera Scheduler and Primavera Web PM, Primavera Cost) ✓ Developed change management business processes ✓ Conducted PM Academy pilot and follow-on production sessions training for 240 participants ✓ Assessed change management training needs and materials ✓ Developed change management procedures and QA controls 	<ul style="list-style-type: none"> • Complete design and implementation of related PMRS elements • Develop and conduct change management training • Develop and conduct tools and process training • Continue providing PM Academy training sessions 	<ul style="list-style-type: none"> • Fully deploy PMRS
Quarterly Project Review	<ul style="list-style-type: none"> ✓ Procured PM software ✓ Defined WSDOT agency wide WBS 	<ul style="list-style-type: none"> • Continue conducting QPRs • Complete design and implementation of related PMRS elements – reporting • Work with HQ Program Delivery Managers and other participants to identify issue and concerns that require executive attention • Develop reporting standards and QA controls 	<ul style="list-style-type: none"> • Develop and conduct reporting training • Fully deploy PMRS

BMP Category	Completed Phase 2 Activities	Ongoing Activities	Planned Activities
Contract Administration	<ul style="list-style-type: none"> ✓ Procured PM software ✓ Developed contract administration business processes ✓ Conducted PM Academy pilot and follow-on production sessions training for 240 participants ✓ Assessed contract administration training needs and materials ✓ Developed contract administration procedures and QA controls 	<ul style="list-style-type: none"> • Complete design and implementation of related PMRS elements • Develop and conduct contract administration training • Develop and conduct tools and process training • Continue providing PM Academy training sessions 	<ul style="list-style-type: none"> • Fully deploy PMRS

APPENDIX 3 - INDEPENDENT PROJECT REVIEW PROCEDURE

Updated June 19, 2008

SCOPE

This procedure applies to the performance of independent project reviews on WSDOT capital projects.

PURPOSE

This document establishes a WSDOT standard methodology for conducting independent project reviews for capital projects and includes the following key activities:

- Review project status, especially the overall project management, at the 25% completion level, but no later than 50% level of completion. For long-term projects, suggested review intervals are annually
- Review status of project management upon changeover of PM or when the project's situation dictates
- Develop action list from recommendations and begin implementation.

ROLES AND RESPONSIBILITIES

Regional Administrator (RA)

- Review action list and action implementation.

Assistant Regional Administrator (ARA)

- Provide oversight of action implementation
- Assist PE, as necessary, in implementation.

Project Manager (PM)

- Participate in review, prepare action item list, and complete action implementation.

Regional Program Delivery Manager (RPDM)

- Review action list and offer comments
- Assist in reviews and identify projects for special external reviews.

INDEPENDENT PROJECT REVIEW ACTIONS

Establish Independent Project Review Team

- Assistant Regional Administrator (ARA)
 - Establish the independent project review team and initiate the review.

Conduct Independent Project Review

- Project Manager
 - Host the review effort and provide working materials
 - Present the project, issues, and the approach being used to the peer review team
 - Prepare an action list from review recommendations and implement
 - Respond to the peer review team in writing by stating which comment or suggestion should or should not be implemented and why; distribute copies to RA, ARA and RPDM.
- Review Team
 - Review project scope definition, specialty group and consultant agreements, construction contract, PMP, risk management plan, and other pertinent project documentation.
 - Assess project progress versus delivery problems, focusing on scope, schedule, budget, and quality issues
 - Prepare project-specific recommendations as appropriate.

MAINTENANCE

- Maintain status of action items as implementation proceeds
- Copies of the Independent Project Review action item list, along with any PM response and implementation actions taken, shall be stored in the project file.

APPENDIX 4 – PMRS GOALS AND OBJECTIVES

Goal #1: Define, implement, and train WSDOT staff on industry-leading project management business processes.

1A) Project Management Plan Development

- Improve the use of PMPs on active projects to better plan and communicate the work that needs to be accomplished and to anticipate change for proactive project delivery.
- Conduct regional inventories of PMP completion and develop completion or update plan and schedule to determine improvements in training and delivery efficiency.

1B) Scope and Change Management Practices

- Refine and enhance change and scope management business processes to implement uniform agency processes for control and reporting.
- Assess scope management training needs and materials as part of the implementation of the scope management process for support by PMRS COTS.
- Develop scope management procedures and QA controls.
- Develop and conduct skills training.
- Develop and conduct related tools and process training.

1C) Work Breakdown Structure

- Develop a uniform WBS for use in PMRS for roll-up reporting and portfolio management.
- Apply across multiple projects effectively.

1D) Risk Management

- Develop and conduct risk management awareness training about current WSDOT processes including CEVP and CRA. Deliver this training through the PM Academy, the capabilities of the agency's estimating software, and business process refinement to better anticipate possible changes that impact project delivery.

1E) Schedule Management

- Build and maintain a CPM schedule for each project using uniform processes and efficient methods for effective change management. Schedule development is an essential part of planning and organizing the project. WSDOT will have up-to-date schedules for all its active capital projects.
- Establish periodic update policies and procedures using consistent cut-off dates for organizational accountability.
- Assign responsibility at task level for matrix organization accountability. Service providers will be responsible for input on their respective activities.
- Develop and use standard schedule templates for common assignments to achieve consistency and efficiency in project delivery.
- Use Project Master Schedules and departmental, organizational, and service provider schedules for coordination in a matrix organization for effective reporting and early problem identification.
- Implement policies and procedures to reinforce the objective of accurate schedule development and maintenance.
- WSDOT's current training program will be expanded to reflect the business process of schedule building, updating and reporting for measuring performance, and improving accountability.
- Require contractors and consultants to submit conforming and updated schedules for progress reporting and schedule adherence.

1F) Cost Management/Earned Value Management

- Implement effective cost management of their project delivery. Earned value is recognized as an industry-standard for progress estimating and early recognition of cost and schedule impacts.
- WSDOT will require the PM, Specialty Group leads, consultants, and contractors to report progress using time-phased budgets and accepted earning rules and compare these to budgets and forecast cost-at-completion and time-to-complete.
- Implement a process to collect all cost-related data into the cost tool, revise the cost as needed, determine cost-to-date, and generate a time phased cost-to-complete. This process will improve project management effectiveness and improve cash flow forecasts.
- Require actual costs to be reported in a consistent and timely manner so that when added to an independent estimate of the cost-to-complete, an estimate at completion is provided.
- Implement a process to determine an estimated cost-to-date as of the end of the period. The cost-to-date is a combination of the invoice paid to date and the estimated outstanding expenditures. This process is focused on the project development phase.

1G) Cost Estimating

- Refine WSDOT's process for the development of the construction estimate during the project planning, design, and construction phases to be able to retain the record of estimates as they are updated and repeated throughout the lifecycle of the design. This process develops a base estimate which is the foundation for the CEVP process. This process is focused on the project development phase to provide the appropriate level of confidence for the preparation of project budgets.

1H) Document Control

- Improve efficiency of staff through use of COTS products and modern document control processes and procedures to take advantage of technology advances in enterprise-wide work delivery products to meet the demands of the expanded capital construction program.
- Facilitate receipt, logging, distribution, tracking, and resolution of issues generated by project documents.

1I) Quarterly Project Reviews

- Develop internal processes, databases, and reporting tools using the PMRS suite to improve efficiency and provide uniform and timely information for internal and external stakeholders and general public reporting.
- See the Portfolio Management and Rollup Reporting Objective for more information.

1J) Contract Administration and Agreements

- All work, including internal (informal) assignments, should be under a written contract to improve change management and control of scope, schedule, and budget, and to refine WSDOT's processes and procedures to allow for efficient administration of changes. To do this, WSDOT will:
 - Establish scope, schedule, and budget agreements with each responsible group
 - Contracts can be internal or external, informal or formal, all documented
 - Service Providers submit "proposals" of cost and time for specific deliverables
 - PM determines acceptability of proposals
 - Service Providers provide periodic feedback on contract status.

Goal #2: Define, implement, and train WSDOT staff on industry-leading project management software to manage scope, schedule, cost, and associated information.

2A) Primavera Scheduler and Primavera Web PM

- The PMRS scheduling tool contains CPM logic that provides the primary means of assessing schedule achievement and improving on-time performance.
- Using the scheduling tool, Project Managers and Specialty Groups can manage resources and coordinate remote work activities with the regions.
- Use tools capabilities to assign task lead and support functions for clarity of accountability.
- Implement scalable scheduling requirements to project size to be efficient in use of limited resources.
- Adjust standard specifications to add requirement that contractors provide schedules for reporting purposes to verify milestone achievement and contract compliance.
- Train staff to use tool.

2B) Project Cost Management

- The selected tool provides a uniform and fairly objective measure of communicating schedule and cost progress. It meets the need to effectively manage and report costs. To do this, the tool will be configured to have:
 - PM focuses on total project budget for effective accountability
 - HQ focuses on funding source & biennium budgets to meet reporting and control needs
 - To address multiple funding sources, funding can be allocated, attributed to a specific Control Account, or a specific line item within a Control Account
 - Budgets, commitments, actual expenditures, and forecasts all coded and entered consistently
 - Use of consistent as-of cut-off dates
 - Hold Project Management responsibility for project cost data throughout all phases of project delivery.
- Track internal costs by tying into TRAINS.
- Track WSDOT accruals based on input from consultants/contractors to account for gap in expenditure tracking.
- Track invoices using consistent cut-off dates.
- Use consistent Control Accounts.

2C) Project Cost Estimating

- Use of consistent WSDOT-wide estimating processes improves the accuracy and uniformity of estimates.
- Types of estimates for which procedures will be developed are:
 - Construction cost estimates generated at specific design intervals and budgetary funding cycles
 - Parametric estimates prepared during system-wide or corridor planning studies and program development
 - Definitive estimates prepared during project definition phase.

2D) Primavera Contracts

- Use Primavera Contracts to effectively manage and collaborate on contract administration and change approvals within the DOT, beginning with Region Program Management through possible OFM/Legislative approval.
- Changes identified by PM or Service Providers can be assessed and resolved.
- Cost and time impacts are included with description of and reason for change to objectively document reasons for proposed changes

2E) Open Text Livelink (Project ECM)

- Use the Project ECM to manage documents and coordinate work effectively across regions and between organizations and service providers.
- Use the Project ECM to enforce agency standard document retention rules.
- Use the Project ECM to implement high priority project management and reporting workflows.
- Use the Project ECM to support project collaboration among all project staff, Specialty Groups, and stakeholders.
- Use Project ECM to provide comprehensive search capabilities that will save time and meet the demands of reporting on an expanded work load.

Goal #3: Provide the mentoring, support, and cross-organizational communication needed to implement the processes and tools required to support industry-leading project management business practices.

3A) SPMG Tier 1 Support

- Provide co-located specialists in program and project management to assist WSDOT develop and implement advanced industry practices and tools in program and project delivery improvement and workforce skills enhancement in project control, cost estimating and cost management, scheduling, workflow efficiency improvements, contract management, and internal and external reporting functions.
- Assist headquarters and regional staff to refine the current PCRF process to provide clarity and documentation of approved changes to scope, schedule, and budget to meet legal requirements.

3B) SPMG Tier 2 and Tier 3 Support

- Train WSDOT Staff to use PMRS to achieve the following:
 - Assess program expenditure planning and forecasting
 - Strategically review regional program delivery
 - Develop project and program level reports (web pages, QPRs, GNB, GMAP, etc.)
 - Review project costs and schedules
 - Work with WSDOT to implement scalable project management plans to develop and communicate project scope, schedule, budget, and risks
 - Perform document management
 - Perform claims analysis
 - Develop resource loaded schedules, as needed
 - Perform project cost recovery analysis
 - Review and prepare consultant contracts
 - Help incorporate new PMRS system to manage existing WSDOT processes
 - Help to develop standardized templates/reports
 - Provide training in use of system for project controls

- Provide communication link between WSDOT regional staff and PMRS development staff
- Use schedules in a matrix organization to facilitate communication and coordination of work
- Train WSDOT staff in building, maintaining, and reviewing schedules to advance the skills of the department
- Use updated construction schedules to help with communicating progress, resolving time based conflicts, and aid in claims avoidance and control of extras
- Use WSDOT's expanded training program to train staff to use time-phased budgets and earned value to communicate progress and help with early problem solving
- Use Tier 2 and 3 SPMG staff to assist with regional deployment and training.

3C) Cost Estimating

- Build upon the WSDOT practice of providing construction cost estimates with the appropriate level of accuracy consistent with the detail known at a particular phase of project development and communicating these estimates with confidence to the stakeholders of the agency.
- Use Tier 2 and 3 SPMG staff to assist with regional deployment and training.

3D) Risk Management

- Use Tier 2 and 3 SPMG staff to assist with regional deployment and training.

3E) Schedule Management

- Use Tier 2 and 3 SPMG staff to assist with regional deployment and training.

3F) Project Cost Management

- Use Tier 2 and 3 SPMG staff to assist with regional deployment and training.

3G) Document Control

- Use Tier 2 and 3 SPMG staff to assist with regional deployment and training.

3H) Contract Administration

- Use Tier 2 and 3 SPMG staff to assist with regional deployment and training.

Goal #4: Provide Roll-Up Reporting needed to support program management at all levels within WSDOT (Project Portfolio Management) and to meet external reporting requirements for accountability regarding on-time/on-budget project delivery.

4A) Portfolio Management and Rollup Reporting

- Using the integration of Primavera Scheduler and Contract Manager along with the operational data store, the Work Breakdown Structure and the Enterprise Breakdown Structure, roll up reporting will be improved and expanded to meet the demands of the growing construction program in an efficient manner with limited staff expansion.

4B) Internal Reporting

- Use COTS tools' capabilities such as Primavera Web PM to design and implement standard project management reports to provide accurate and timely information on project status for decision making purposes and change management.
- Generate standard and ad hoc, detailed, integrated, and timely project reports. These reports include:
 - Project specific status reports
 - Corridor-level progress or cost and funding reports
 - Area and regional management reports
 - Executive level status and exception reports
 - External stakeholder reports (see below)
 - Ad hoc reporting from either COTS capabilities or from the operational data store tied to legacy systems and the COTS.

4C) External Web Portal Reporting

- Provide vehicle for external stakeholders to view project status data on a periodic basis to meet external reporting requirements and facilitate preparation of standard agency reports such as the Gray Notebook and Quarterly Project Report pages.

4D) Work Breakdown Structure

- Develop and implement enterprise-wide structure for consistent roll-up tracking and reporting.
- Use consistent terminology and coding for application across business units to effectively manage projects in a matrix organization.
- Develop a process to control the addition of global activity and project codes in the PM tools as follows:
 - Develop code structure for reporting across business units and roll up to highest level of the organization.
 - Provide flexibility at the PM level to manage projects based on size and complexity.
 - Users determine need for new codes and if they are global or custom.
 - Global codes to be added by an administrator for consistency.
 - Provide for Code Control & Management.
 - Global Codes
 - Custom Codes
 - Provide cross-cutting organizational code types.
- Use the Project ECM to allow for comprehensive search capabilities that will save time and meet increasingly demanding reporting requirements.