

PROJECT MANAGEMENT PLAN

I-90 Snoqualmie Pass East Hyak to Keechelus Dam



Washington State
Department of Transportation

I-90 Project Design Office
Yakima, Washington

Rev. 1
February 2009

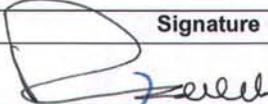
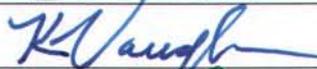
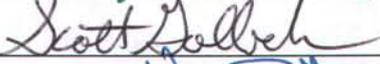
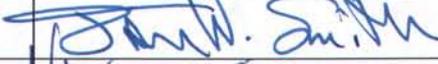
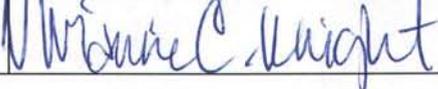
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Acronyms and Abbreviations

AC	actual cost
AR	acceptance review
BA	Biological Assessment
BO	Biological Opinion
CEVP	Cost Estimate Validation Process
CFD	Computational Fluid Dynamics
CPI	cost performance index
CR	constructability review
CV	cost variance
CWA	Clean Water Act
DCR	discipline coordination review
DAHHP	Department of Archaeological and Historic Places
DEIS	Draft Environmental Impact Statement
EIS	environmental impact statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
EV	earned value
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
GEC	General Engineering Consultant
IDT	Interdisciplinary Team
I-90	Interstate 90
ITR	independent technical review
MDL	Master Deliverables List
MP	milepost
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
ODCs	Other Direct Costs
PCRF	Project Control Request Form
PMP	Project Management Plan
PS&E	Plans, Specifications, and Estimate
PV	planned value
QA	quality assurance
QC	quality control
QMP	Quality Management Plan
RCW	Revised Code of Regulations
ROD	Record of Decision
ROW	right of way
SEPA	State Environmental Policy Act
SPI	schedule performance index
SV	schedule variance
TESC	temporary erosion and sediment control
TPA	Transportation Partnership Account
USACE	US Army Corps of Engineers

USBR	US Bureau of Reclamation
USFWS	US Fish and Wildlife Service
USFS	US Forest Service
WBS	Work Breakdown Structure
WDFW	Washington State Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WDOE	Washington Department of Ecology
WSDOT	Washington State Department of Transportation

Introduction

This Project Management Plan (PMP) has been developed for the Interstate 90 (I-90) Snoqualmie Pass East Project from Hyak to Keechelus Dam to implement the requirements of Executive Order E 1032.0, "Project Management," dated July 1, 2005. The Executive Order states that each Project Manager is to "develop and document a project management plan for each project assigned to them." The federal act entitled "Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users" (SAFETEA-LU) also requires that a PMP be developed for projects with a total estimated cost of more than \$500 million that are receiving Federal funds for construction, regardless of the amount received (Public Law 109-59, Subtitle I, Section 1904).

The PMP follows the Washington State Department of Transportation (WSDOT) five-step project management process:

- Initiate and align the team
- Plan the work
- Endorse the plan
- Work the plan
- Transition and closure

This WSDOT project management process is described in further detail on the project management website:

<http://www.wsdot.wa.gov/Projects/ProjectMgmt>

This PMP has been developed using the draft template for major Federal Highway Administration (FHWA) projects, as well as the templates provided on the WSDOT project management website, and in its initial revision is designed to address the preliminary engineering and pre-construction phases of the project. The PMP will be updated and revised as needed, as the project proceeds through its implementation phases. At a minimum, the PMP will be updated and revised to address activities required for construction, contract closeout, and turnover to operations and maintenance prior to approval of the plans, specifications, and estimate (PS&E) package.

Updates or changes that do not affect the roles and responsibilities of various parties as outlined in the plan will be made as required without re-endorsement of the plan. Revisions to the roles and responsibilities outlined in the plan will require its re-endorsement, as described in Section 3.0.

Revision 1 updates the project schedule and cost sections, describes project phasing, updates the work breakdown structure, separates the Quality Management Plan as a separate document, and renames the Environmental Monitoring section the Environmental and Compliance Plan. Revision 1 does not affect the roles or responsibilities of parties outlined in the plan.

1.0 Initiate and Align the Team

This section of the I-90 PMP describes the overall project; summarizes the mission and key objectives to be attained by the project; identifies the project team and establishes the roles and responsibilities of the project team; establishes measures of success for the project; summarizes major milestones; establishes physical and administrative project boundaries; and outlines the major operating guidelines that will be incorporated into the management of the project. This section also establishes the common ground from which the project team will work to achieve the project objectives.

1.1 Project Description and Scope of Work

I-90 is a major transportation route, linking Puget Sound to Eastern Washington and beyond. Improvements to a 15-mile corridor along I-90 from Hyak to Easton are needed to meet several identified needs. These needs, summarized in the June 2005 I-90 Snoqualmie Pass East Draft Environmental Impact Statement (DEIS), include:

- **Reduce the risks of avalanche to the traveling public and eliminate road closures required for avalanche control work.** I-90 was closed for an average of 120 hours per year between 1992 and 2004 due to avalanche control work, poor weather and roadway conditions, and accidents. Avalanche control work alone causes I-90 to be closed for 65 hours each year. It is conservatively estimated that the closures for avalanche control work cost business and private travelers \$17.5 million each year.
- **Reduce the risk of rock and debris falling onto the roadway from unstable slopes.** Several unstable slopes that deposit debris on the roadway have been identified throughout the project. In the past, debris from these unstable slopes has closed traffic lanes and caused serious accidents. The debris ranges in size from small rocks to large landslides. Although landslides are not a regular occurrence, their potential threat to public safety is significant and warrants solutions.
- **Fix structural deficiencies by replacing damaged pavement.** The pavement on this 15-mile stretch of roadway is between 30 and 50 years old. It has exceeded its lifespan and is rapidly deteriorating. Between 1993 and 1996, portions of the roadway were reinforced to help extend the pavement life to approximately 2010. In 1998, extensively damaged areas were overlaid with asphalt pavement. The asphalt pavement rapidly deteriorated due to extreme weather conditions and heavy use, and it was replaced three years later at a cost of \$1.5 million. As more pavement fails, repeated overlay projects will be required, which will increase maintenance costs and cause additional traffic delays.

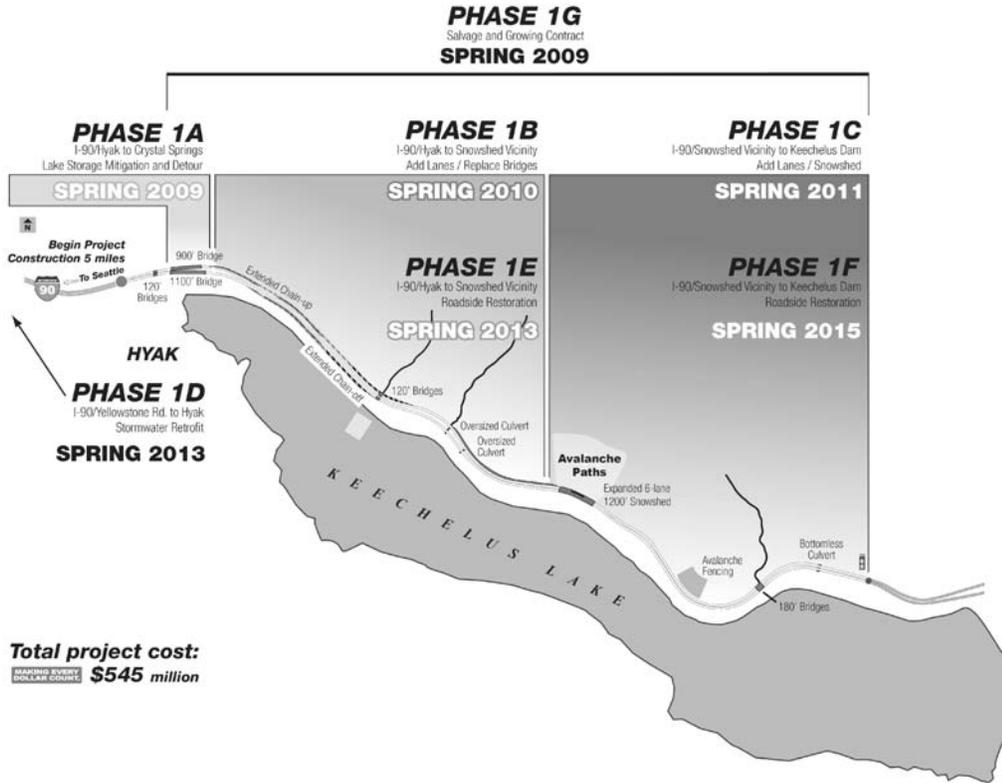
- **Provide for growth-related increases in traffic volume.** Each year 35 million tons of freight and 10 million vehicles travel over Snoqualmie Pass. Daily traffic volumes have climbed to as high as 58,000 vehicles per day, which exceeds the amount of traffic I-90 was designed to carry in this area. Traffic frequently backs up on weekends (particularly holiday weekends), and backups stretching for up to 20 miles have been observed. Average traffic volumes on I-90 are increasing by 3.5 percent each year. These annual increases will add approximately 20,000 vehicles per day to I-90 over the next 20 years. Additional traffic lanes are needed to accommodate predicted increases in travel volumes and to ensure that this section of I-90 continues to function as a safe and efficient roadway.
- **Improve public safety.** This 15-mile stretch of I-90 has an accident rate that is twice that of other similar rural interstate highway sections. There are many sharp curves, which limit sight distance throughout the corridor. Unstable rock slopes often deposit debris on the highway, creating hazards that may not be seen in time for drivers to avoid. Winter storm events amplify the hazards caused by limited sight distance and alignment problems throughout this section of the corridor.
- **Connect habitat across I-90 for fish and wildlife.** Snoqualmie Pass is recognized as a critical link for the north-south movement of fish and wildlife living in the Cascade Range. The project area is adjacent to several important wilderness areas that provide a variety of habitats due to variations in topography and precipitation. Over the past several years, land conservation efforts have added approximately 112 square miles to the National Forest system in the project area. The goals of these efforts are to protect old-growth forest, provide larger contiguous blocks of forest habitat, and facilitate habitat and hydraulic connections across I-90. Adequate connections between habitats on either side of I-90 are necessary for the continued health of the project area's diverse ecosystems.

The I-90 Project is the first of several projects that will address these needs along the 15-mile corridor by reconstructing approximately five miles of I-90, from Hyak at milepost (MP) 55.1 to the vicinity of Keechelus Dam (MP 59.9) (see Exhibit 1-1).

In May 2006, the I-90 Interdisciplinary Team (IDT), which was convened by WSDOT to evaluate alternative approaches, issued its recommendations regarding the Preferred Alternative addressing identified needs along the entire 15-mile segment from Hyak to Easton. The IDT, composed of representatives from WSDOT, the US Fish and Wildlife Service (USFWS), the US Forest Service (USFS), and the Washington State Department of Fish and Wildlife (WDFW), recommended that the "Shoreline Alignment" alternative be constructed; geometric elements of the roadway be upgraded where practical to 75 miles per hour (mph) design standard; pavement be replaced; and an additional lane added in each direction. Corridor-specific standards for aesthetics/architectural elements and roadside restoration were to be applied.

**Exhibit 1-1
Project Vicinity Map**

**I-90 Snoqualmie Pass East - Hyak to Keechelus Dam Project
PROJECT VICINITY MAP**



Listed below (from west to east) are the significant improvements or major construction features identified in the May 2006 recommendations. Some of these features have been updated since the original recommendations were developed.

- Single span bridges (approximately 120 feet long) would be constructed along the western margin of the Gold Creek valley (MP 55.3) to serve as a wildlife crossing that is above the full-pool elevation of Keechelus Lake. Long bridges (approximately 900 feet westbound and 1,100 feet eastbound) would replace Bridges 90/106N and 90/106S across Gold Creek in order to improve connectivity and allow Gold Creek to meander within the historic floodplain. The alignments would be shifted south into Lake Keechelus to maintain sight distance along the new longer bridges. The existing bridges and embankment would be removed and the area restored.
- Longer chain on/off areas would be added just east of Gold Creek. The eastbound chain-off area would be extended eastward to MP 56.6 near Rocky Run Creek. The westbound chain-on area would be extended eastward beyond Rocky Run Creek to MP 57.0. New illumination and Intelligent Transportation Systems would be installed.
- New bridges (approximately 120 feet long) would be constructed at Rocky Run Creek (MP 56.8) to replace the existing eastbound bridge and double culverts in the westbound direction. The horizontal curves in this vicinity would be flattened to improve sight distance.
- The small box culvert at Wolfe Creek would be replaced with a larger culvert (approximately 20-foot span), meeting WDFW requirements.
- At the avalanche chutes near MP 58.1, the alignment would be shifted away from the slope and a viaduct (approximately 1,100 feet long) would be built over the lake. The existing roadway along the Lake Keechelus Snowshed Bridge would be removed to create a large chute, allowing avalanches to pass beneath the bridges (the viaduct was later replaced by a snowshed). Rock slopes in the vicinity would be excavated and stabilized. A bridge (approximately 600 feet long) would be constructed on the eastbound alignment at MP 58.6. The bridge was later replaced by walls and a bridge.
- A series of snow support structures would be installed above the roadway on Slide Curve (MP 58.8 to 59.0) to prevent avalanches. A separated median would be created in this area where none currently exists (MP 58.5 to 59.6) to improve safety and operations. Later, a median wall through Slide Curve was designed that provided 50' of separation between west- and eastbound lanes.
- Resort Creek (MP 59.5) and its active channel migration zone would be spanned by a series of bottomless culverts. One of the culverts would be sized (approximately 12 feet high x 30 feet wide) to provide additional clearance for

wildlife. Later, the design decision was made to replace the culverts with two new bridges to improve creek channelization.

- Townsend Creek (MP 60.6) would be spanned with a large bottomless culvert (approximately 12 feet high x 25 feet wide) to provide additional clearances for wildlife.
- A wildlife overcrossing (approximately 150 feet wide) would be constructed over both directions of travel at the rock knob adjacent to the Keechelus Dam spillway (MP 60.8). A small draw with an intermittent stream immediately east of the rock knob (MP 60.9) would be spanned with short bridges (approximately 120 feet long).
- The existing culverts at Price Creek (MP 61.3) and Noble Creek (MP 61.4) would be replaced by short bridges (approximately 120 feet long). The sno-park/rest area would be closed, the pavement removed in both directions, and these areas would be rehabilitated as part of the project's mitigation strategy.
- The profile grade of the mainline would be raised east of Price Creek and new bridges (approximately 600 feet long) would be constructed across Bonnie Creek (MP 62.2) together with an unnamed tributary.
- A series of short bridges (each approximately 120 feet long) would be constructed in the vicinity of the Stampede Pass Interchange. One set of bridges would be located west of the interchange at MP 62.5, another set at Swamp Creek (MP 62.7), and a third set of bridges located east of the interchange at MP 63.2 across a small drainage. The interchange would be reconstructed with higher profiles on the ramps and the crossroad. Under crossing Bridge 90/113 would be replaced.
- A draw with an unnamed stream east of the interchange (MP 63.7) would be spanned with short bridges. The Cabin Creek interchange would be reconstructed with the ramp and cross-road grades raised in order to replace the low-clearance undercrossing Bridge 90/114. The Toll Creek culvert (MP 64.1) would be replaced with a larger bottomless culvert meeting WDFW requirements.
- The roadway on Easton Hill (MP 64.2 to 67.6) would be separated by a median section and terraced using reinforced slopes or retaining walls. Culverts at Cedar Creek (MP 64.6) and Telephone Creek (MP 65.6) would be replaced with bottomless culverts meeting WDFW requirements. The roadway would be realigned near MP 66.0 to create a rock catchment ditch along existing rock slopes. A fork of Hudson Creek (MP 67.2) would be spanned with a two-span bridge (approximately 230 feet long) in each direction of travel.
- A natural draw at the crest of Easton Hill (MP 67.7) would be spanned with a bridge (approximately 120 feet long) in the westbound direction. A draw just east of the crest in the eastbound direction (MP 67.8) would be spanned with a bridge

(approximately 120 feet long). Truck climbing lanes would be extended across the crest of Easton Hill in both directions of travel. The new westbound lane would end near MP 66.8 and the eastbound lane would end near MP 67.7.

- Wildlife overpasses (approximately 150 feet wide) would be built over each direction of travel at approximately MP 68.5 westbound and MP 68.7 eastbound. At the county road crossing (MP 69.1), Bridge 90/117N on the westbound alignment would be widened for a fourth lane. Bridge 90/117S on the eastbound alignment would be widened for a third lane.
- At the Kachess River (MP 69.5), Bridge 90/118N and Bridge 90/118S would be widened to include a third lane in each direction.

In December 2006, the I-90 Project Team conducted a Value Engineering session to evaluate conceptual designs based on the improvements and construction features described above. The Value Engineering session participants recommended nine modifications to the conceptual design that would potentially improve the cost-benefit and constructability of the project. The I-90 Project Team accepted seven of these recommendations:

- Analyzing future projects to the east within the 15-mile corridor for opportunities to use waste material generated in this first 5-mile project for embankment construction. The I-90 Project Team is developing a design that would use the waste material from the first 5 miles for the earthwork required for upgrades to the roadway along Amabilis Grade (MP 64.5 to MP 66.5).
- Re-evaluating material that will be generated by rock cuts from MP 57.1 to 59.3 (including Slide Curve) for potential reuse as both fill and aggregate. The I-90 Project will reuse the material as appropriate, based on the results of sampling and testing conducted during the preconstruction geotechnical program.
- Constructing a larger snowshed that covers the lanes in both directions of travel in lieu of the viaducts proposed for the avalanche chutes near MP 58.1, at a significant cost savings. The I-90 Project Team is proceeding with a design that incorporates this recommendation; the final cost savings achieved will be determined by the final length of snowshed required to achieve the desired reduction in avalanche risk.
- Improving drainage to keep water off of the travel lanes by reviewing the use of overflows. The I-90 Project Team is evaluating design alternatives that will provide backup drainage in the event that the primary drainage inlets are blocked.
- Optimizing the design speed to achieve a consistent design speed through this part of the corridor, creating a transition between the summit section and Easton Hill. The I-90 Project Team has incorporated this recommendation by developing a design based on a 65-mph design speed along Keechelus Lake, and a 70 mph design speed from Keechelus Dam to Easton.

- Optimizing retaining wall types for constructability. The I-90 Project Team has completed a conceptual study that recommends appropriate retaining wall structures along the 5-mile project. A key consideration in these recommendations was constructability.
- Exploring opportunities to replace a proposed bridge at Slide Curve with retaining wall sections or a hybrid combination. The I-90 Project Team is developing a design that replaces the Slide Curve Bridge with a hybrid system.

The I-90 Project Team did not accept a recommendation to raise the eastbound road profile through the rock cuts to reduce the volume of waste material generated. The team was concerned about the stability of the embankments that would be created, as well as the increased costs associated with constructing a required wall between the eastbound and westbound roadways.

The I-90 Project Team is still evaluating a recommendation to complete additional soil testing at Gold Creek that may reduce the cost of foundation and substructure construction. The I-90 Project Team will evaluate the sensitivity of the cost of the bridge to the seismic design criteria, and determine whether further investigation and site-specific analysis is warranted.

1.2 Team Mission/Assignment

The mission of the I-90 Project Team is to deliver the I-90 Snoqualmie Pass East Project on schedule and within budget, providing a safe and efficient freeway that meets the identified needs and minimizes the construction and travel time delays to the public. The current activities of the I-90 Project Team, and the scope of this PMP, are limited to the pre-construction and right of way (ROW) phase of the project. Specific near-term objectives to be attained by the I-90 Project Team during this project phase are:

- Complete the I-90 Snoqualmie Pass East National Environmental Policy Act (NEPA) process through the Final Environmental Impact Statement (FEIS) and the Record of Decision (ROD) for the entire 15-mile corridor from Hyak to Easton (MP 55.1 to MP 70.3)
- Complete the permitting and mitigation aspects of the project for the 5-mile segment from Hyak to Keechelus Dam (MP 55.1 to MP 59.9)
- Complete and deliver PS&E packages ready to go to Advertisement for the Hyak to Keechelus Dam segment
- Manage project risks and schedule opportunities to meet the project schedule within the project budget

1.3 Major Milestones

The following major milestones apply to the I-90 Snoqualmie Pass East Project. Completion dates provided are based on the December 2008 I-90 Project Schedule:

	WSDOT Project Delivery Cycle Major Milestone	Completion Date:
X	Project Definition Complete	August 2006*
X	Begin Preliminary Engineering	December 2005
X	Environmental Documentation Complete	September 2008
X	Right of Way Certification	
X	Advertisement (Ad date)	Phase 1A: February 2009 Phase 1B: October 2009 Phase 1C: October 2010 Phase 1D: October 2013 Phase 1E: October 2013 Phase 1F: October 2013 Phase 1G: Summer 2009
	Bid Opening	
	Award	
	Execution	
	Construction Start	
X	Operationally Complete (Open to Traffic)	October 2015
	Final Contract Completion	

* This is the date the Project Definition was submitted to the Regional Office for Approval

1.4 Project Boundaries

The following boundaries define the extent of the project and the limit of the team's decision-making authority.

Project Limits (MP to MP). The I-90 Snoqualmie Pass East Project PS&E package addresses the portion of I-90 from MP 55.1 to MP 59.9, or from the vicinity of Hyak eastward to the vicinity of Keechelus Dam. The FEIS and ROD are broader in scope, and address proposed improvements to I-90 from Hyak to Easton (MP 70.3).

Funding Limits. The current total funded project cost for the I-90 Snoqualmie Pass East Project is \$545 million. Of this amount, \$54 million has been budgeted to complete the PS&E, environmental documentation, and ROW certification.

Legal and Regulatory. A comprehensive list of potentially applicable legal and regulatory requirements can be found at the following WSDOT website:

http://www.wsdot.wa.gov/Projects/ProjectMgmt/OnLine_Guide/Proj_Legal_Requirements/index.htm

The key regulatory requirements for project environmental documentation and permits include:

- **NEPA Environmental Impact Statement (EIS).** All agencies of the Federal government shall include, for major Federal actions significantly affecting the quality of the human environment, a detailed statement on the environmental

impact of the proposed action, any adverse environmental effects which cannot be avoided should the proposal be implemented, and alternatives to the proposed action. As Federal agency permits and approvals are required for the I-90 Snoqualmie Pass East Project, NEPA requirements must be met. The final EIS was published in August 2008.

- **State Environmental Policy Act (SEPA) EIS.** A SEPA EIS is required when actions are likely to have significant impact on the environment by altering land use, planned growth development patterns, traffic volumes, travel patterns, transportation services or natural resources, or by creating public controversy. The I-90 Snoqualmie Pass East Project meets these conditions. SEPA requirements were fulfilled by the final EIS.
- **Endangered Species Act (ESA).** As endangered species (Bull Trout) are known or likely to occur in the project area, WSDOT prepared a Biological Assessment (BA) for the I-90 Snoqualmie Pass East Project. The BA is a document required for any major construction activity that analyzes the potential affects of the project on listed species and critical habitat and justifies a particular effect determination. Federal agencies are responsible for evaluating impacts to listed species from all federal actions, regardless of scope. For actions other than a major construction activity, the agency still must evaluate the potential for adverse effects and consult with the service, if necessary. The BA included: results of on-site inspections to determine the presence of listed species and/or critical habitat, analysis of likely effects of the proposed action (and alternatives) on the species and/or critical habitat based on biological studies, literature review, and expert views. The USFWS reviewed the BA and issued a Biological Opinion (BO) as to whether the proposed action was likely to jeopardize the continued existence of a threatened and endangered species and critical habitat in the area. The BO was issued on April 29, 2008.
- **National Historic Preservation Act Section 106.** The National Historic Preservation Act requires WSDOT to identify historic properties within the project area that may be affected, evaluate their eligibility for listing on the National Register of Historic Places, notify consulting parties, assess and determine the adverse impacts (if any) that the project will have on these properties, and resolve the impacts and document concurrence of the consulting parties in the resolution. The existing Keechelus Lake Snowshed is a potentially historic structure and required evaluation under the National Historic Preservation Act. The Historic Structures Report evaluated Travelers' Rest eligibility for National Register for Historic Places as mitigation for removal of the snowshed. SHPO will receive the report in February 2009.
- **Department of Transportation Act of 1966 Section 4(f).** A Section 4(f) Evaluation presents the considerations, consultations, mitigation measures and alternatives studied for the use of park and recreation lands, wildlife and waterfowl refuges, and historic sites of national, state or local significance. As

the snowshed is a potentially historic structure, a Section 4(f) evaluation was submitted on March 31, 2008.

- **Clean Water Act (CWA) Section 404.** There are two types of Section 404 permits: Nationwide Permits and Individual Permits (needed if one of the nationwide permits cannot be used). Conditions requiring 404 permits include discharging, dredging, obstructing, altering, improvement or placing fill material within waters of the United States or adjacent wetlands. As the I-90 Snoqualmie Pass East Project may have a potentially significant impact, and/or exceed Nationwide Permit thresholds, an Individual Permit is required under Section 404. A 404 permit application was submitted to the Corps of Engineers.
- **Requirements of Revised Code of Regulations (RCW) 90.48 (Federal CWA Section 401 Water Quality Certification and Section 402 National Pollutant Discharge Elimination System [NPDES] Permit).** Any commercial or industrial operation of any type that results in the disposal of solid or liquid waste material into the waters of the state must procure a permit from the Washington Department of Ecology (WDOE) before disposing of such waste material. As the I-90 Snoqualmie Pass East Project will result in stormwater discharges to waters of the state during and after construction, the requirements of RCW 90.48 and federal NPDES permit requirements for stormwater apply. A CWA Section 401 water quality certification was forwarded to the Administrator of the US Environmental Protection Agency (EPA) for review. If the Administrator determines that there may be an impact on the waters of another State, the Administrator must notify the other State, the Federal license or permitting agency, and the State Department of Transportation. Section 401 Certification is issued if the discharge will comply with the provisions of the CWA (Sections 301, 302, 303, 306 and 307) that relate to effluent discharge limitations, water quality standards, national standards for the control of pollutants, and toxic pollutants. A temporary modification to water quality standards during construction was sought as a part of the Section 401 Certification.
- **USFS Northwest Forest Plan/Snoqualmie Pass Adaptive Area Management Plan Consistency Determination.** The USFS has current land use management plans in place for the land surrounding the project corridor. Any actions that the USFS takes (e.g., right-of-way leases or easements) must be consistent with these existing plans. The USFS has not yet completed its determination.
- **WDFW Hydraulic Project Approval.** This permit is required for projects that use, divert, obstruct, or change the natural flow or bed of any state waters (e.g. culvert work, realignment, bridge replacement). WSDOT received HPA approval from WDFW on December 19, 2008.
- **Washington Department of Natural Resources (WDNR) Forest Practices Permit.** This permit is required when project activities affect forest lands, defined as land capable of supporting a merchantable stand of timber which is not

being actively used for a use incompatible with timber growing. A Forest Practices Permit is not required for Phase 1A.

- **Kittitas County Permits.** Local permits required include a Washington State Shoreline Management Act Substantial Development Permit, a Floodplain Development Permit, a Growth Management Act Critical Areas Permit, and a Noise Variance. Kittitas County permits are not required for Phase 1A.

In addition to the above regulatory requirements, the following project constraints have been identified:

- Engrossed Substitute Senate Bill 6051, Section 305, enacted in May 2005, appropriates a maximum of \$435 million in state funds for the I-90 Snoqualmie Pass East Project, with the provision that "...if the preferred alternative selected for this project results in a lower total project cost, the remaining funds may be used for concrete rehabilitation on I-90 in the vicinity of this project."
- The I-90 Snoqualmie Pass East Project is a Transportation Partnership Account (TPA) - funded project. This funding source imposes special review-and-approval requirements for changes to the project scope, schedule, and budget authorized by the Legislature. These requirements are described in Appendix C of the WSDOT Project Control and Reporting Manual (WSDOT 2006), and are supported by the Project Change Management process described in this PMP.
- The I-90 Snoqualmie Pass East Project involves the use of a General Engineering Consultant (GEC). Due to the GEC's involvement in the planning and design of the project, certain restrictions are imposed on the GEC's ability to participate in later phases of the project (e.g., construction). These restrictions are described in the GEC Contract documents.

Mandatory Delivery Dates. The PS&E package and environmental documents must be completed to support an October 2009 Project Advertisement date, with major construction completed and the project open to traffic by October 2014.

1.5 Team Identification – Project Organization Chart

During the preconstruction activities addressed by this revision of the PMP, the I-90 Project Team consists of four key components:

- The I-90 Project Design Office
- Off-Site GEC Resources
- On-Site Non-GEC Consultants
- Off-Site Non-GEC Resources
- WSDOT Region and HQ Support

Each of these components is described in further detail below and a team organization chart is provided as Exhibit 1-2.

The I-90 Project Design Office. The I-90 Project Design Office consists of WSDOT, the GEC, and non-GEC personnel co-located within GEC-rented space in Yakima, Washington. The WSDOT component of the I-90 Project Design Office includes both full-time staff assembled by the I-90 Project Design Office, and staff on temporary loan from the South Central Regional office.

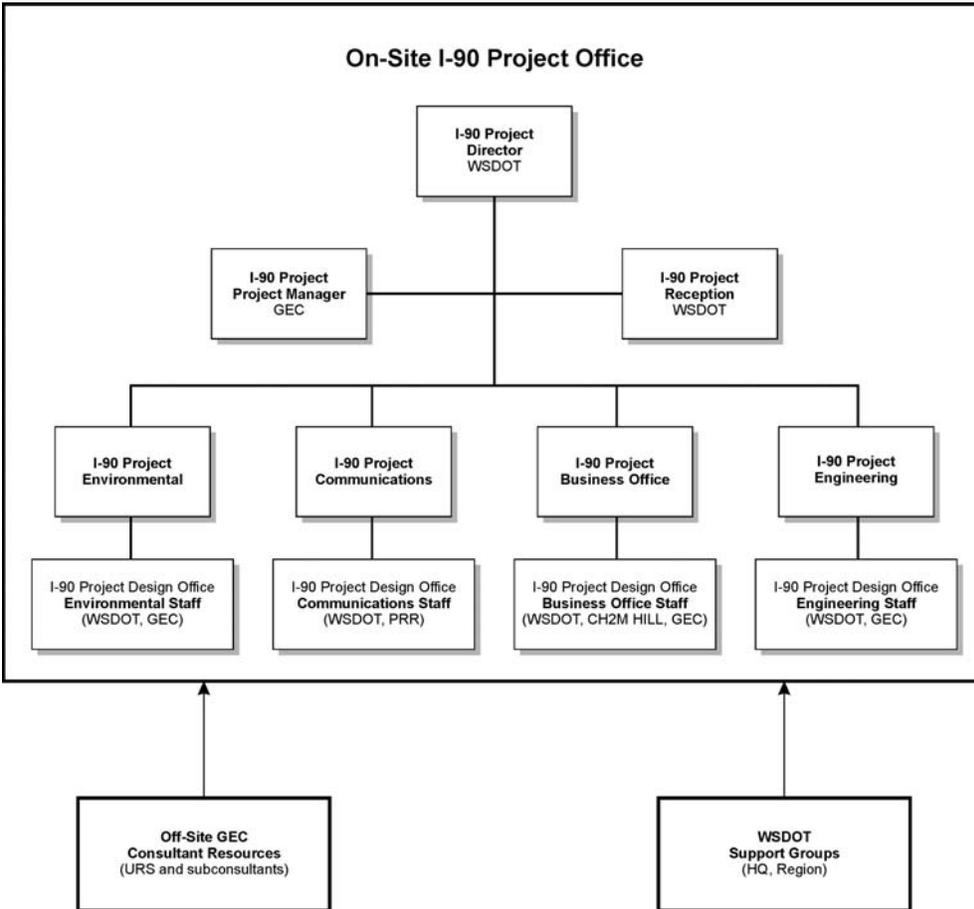
These I-90 Project Design Office assets are organized into four groups (Business, Communications, Engineering, Environmental), each led by a manager. In the case of the Engineering Manager/Project Engineer and the Environmental Manager, the group managers are supported by an Assistant Manager. The group managers (collectively referred to as the I-90 Project Management Team) provide direct day-to-day direction and supervision of the staff within their group, regardless of their affiliation (WSDOT, GEC, or non-GEC). In this role, the GEC and non-GEC consultants provide staff augmentation support to the I-90 Project Team.

The I-90 Project Design Office provides overall direction to the I-90 Project Team, as well as executing specific engineering design and environmental documentation and permitting activities. The I-90 Project Design Office is also responsible for managing the business aspects of the project (including consultant contract administration, scheduling, cost control, document control and reporting), and for coordinating communications efforts for the I-90 Snoqualmie Pass East Project.

The *I-90 Snoqualmie Pass East Project Office Policies and Procedures* (WSDOT 2009a) document was developed and addresses timesheets, work schedule and leave protocols, consultant work schedule and absenteeism policies, vehicle policies and office considerations.

Off-Site GEC Resources. In addition to providing staff to the I-90 Project Design Office staff, the GEC also provides staff that is not located in the I-90 Project Design Office. The off-site consultants provide deliverables based on task orders developed and approved by the I-90 Project Management Team. These task orders require specific deliverables (e.g., plans, specifications, reports, documents), versus task orders that provide level-of-effort technical support in the I-90 Project Office.

**Exhibit 1-2
Project Team Organization**



The GEC contract team includes:

- **URS Corporation.** GEC lead, project management, highways, geotechnical and environmental documentation
- **KPFF Consultants, Inc.** Structural engineering
- **White Shield, Inc.** Surveying
- **Wyllie and Norrish.** Rock slope engineering
- **Art Mears.** Snow avalanche engineering
- **Wilder Construction.** Construction assistance for geotechnical investigation
- **OTAK.** Hydraulic engineering, water quality
- **Hatch Mott MacDonald.** CFD modeling

On-Site Non-GEC Consultants. CH2M HILL provides scheduling, consultant management and cost support to the Business Office. PRR supports the I-90 Office with public outreach.

WSDOT Region and HQ Support. While many of the environmental and engineering activities associated with the I-90 Snoqualmie Pass East Project will be carried out by the I-90 Project Design Office and off-site consultants, certain key activities will be performed and/or supported by WSDOT personnel located within various WSDOT Region offices and WSDOT Headquarters. These Support Groups are described in further detail in Section 1.6.3.

The WSDOT specialty groups indicated below will be involved in the project:

	Access		Local Agencies
X	Architecture (Bridges)	X	Roadside Development (Landscape Architect)
X	Bridge & Structures	X	Maintenance
X	Construction	X	Materials
X	Consultant Liaison	X	Program Management
X	Design & Plans Review	X	Public Information Office
X	Environmental	X	Real Estate Services (Region)
X	Geographical Services (Lidar)	X	Right of Way (HQ)
X	Geotechnical Services	X	Traffic
	Highways & Local Programs		Transportation Data Office
X	Hydraulics	X	Utilities
	Land Survey		Other

1.6 Roles and Responsibilities

This section summarizes the roles and responsibilities of the various elements of the I-90 Project Team that were introduced in Section 1.5.

1.6.1 I-90 Project Design Office

The I-90 Project Design Office includes approximately 60 staff. The following table lists roles, responsibilities, and authorities for the I-90 Project Management Team positions. The I-90 Project Team, including on-site WSDOT and consultant staff and off-site

consultant staff, is expected to perform tasks as assigned by the following key individuals to ensure completion of the project on time and within budget.

Project Position	Project Roles and Responsibilities	Project Authority
Project Director	Responsible for all aspects of the project, including both resources and activities required to deliver Environmental, Engineering, and Communications/Public Outreach documents. Administers the project. Interacts with WSDOT Region and HQ management. Sets policy and establishes priorities. Oversees project communications. Conducts periodic meetings as required. Requests changes to project budget, schedule, and scope using established WSDOT project change control procedures. Ensures that Project Quality Plan and Procedures are implemented	Authorize commitment and payment of project funds within limits of delegated authority, and the approved project budget and work order authorization. Authorize changes to project budgets and schedules within the boundaries of overall authorized project funding and schedule. Recommend changes that affect authorized project funding and schedule for Region and HQ approval using established WSDOT project change control procedures. Approve the PMP and related project policies and procedures. Review project documents prior to issue; approve and/or recommend approval based on standard WSDOT procedures. Approves Project Quality Plan and Procedures.
Project Manager	Provide general project management support to the I-90 Project. Monitor project progress against budget and schedule through periodic status reports and meetings. Closely monitor project risks and opportunities as summarized in Risk Management Plan and CEVP® Report. Identify, avoid, and/or mitigate/resolve project issues using project resources as required. Identify, monitor, and evaluate impacts of potential changes using processes described in Project Change Management Plan. Support Project Director interactions with WSDOT and external organizations as required. Oversee and coordinate all GEC Consultant activities performed for I-90 Project.	Identify and recommend appropriate actions to ensure project is executed to approved budget and schedule. Recommend changes to project budgets and schedules. Review Project Management Plans and project policies and procedures, and recommend their approval. Review and recommend project documents for approval. Approve Task Order budgets for tasks under GEC contract. Approve GEC invoices submitted to WSDOT.
Business Manager	Direct and oversee all administrative activities of the I-90 Project Design Office – Business Office, in the areas of Consultant Management, Scheduling, Cost Control & Reporting, Program Management, and Document Control. Manage the administrative activities of both GEC and non-GEC consultants. Assure timely and accurate preparation and execution of task orders, meeting the requirements of WSDOT policy. Recommend approval of contractor invoices for payment. Oversee development and maintenance of the project schedule and budget to assure that assigned tasks are completed within authorized budget and schedule. Prepare quarterly reports for WSDOT Executive Management. Establish and disseminate office policies and procedures. Establish and administer the office electronic file structure.	Direct activities of the I-90 Project Design Office Business Management Group. Review project Business deliverables prior to issue; approve and/or recommend approval based on standard WSDOT procedures. Recommend approval of contractor invoices for payment.

Project Position	Project Roles and Responsibilities	Project Authority
Communications Manager	Direct and oversee external and internal communications program. Prepare and distribute news releases and other information to the news media. Maintain and update the project website. Arrange and coordinate public meetings, project presentations, and legislative meetings. Develop and make available project presentations, displays, folios, photos, and design visualization materials. Maintain a file of project information, photos, and other project items that are available to the project staff for their use in their daily activities.	Direct activities of the I-90 Project Design Office Communications Group to accomplish assigned tasks within authorized budget and schedule. Review project Communications deliverables prior to issue; approve and/or recommend approval based on standard WSDOT procedures.
Project Engineer/Engineering Manager	Oversee and direct the design, plan preparation and specification effort for the project. Develop project schedule and monthly manpower allocation for project duration. Monitor schedule and furnish updates for incorporation. Manage Engineering activities to meet project milestones and budget. Coordinate and direct all other specialty function managers to produce the final products to be included in the PS&E package to assure that the project meets the scheduled milestone dates. Oversee assembly of the final PS&E package. Prepare a final estimate of quantities for the project. Prepare the final construction cost estimate for the project. Implement quality control procedures to assure quality of delivered products.	Direct activities of the I-90 Project Design Office Engineering Group to accomplish assigned tasks within authorized budget and schedule. Direct the activities of WSDOT Region and HQ Engineering support organizations and contractor resources assigned to Project engineering tasks. Review project Engineering deliverables prior to issue; approve and/or recommend approval based on standard WSDOT procedures. Develop engineering schedule and monthly manpower and budget assessment.
Assistant Engineering Manager	Support Project Engineer/Engineering Manager in roles/responsibilities noted above.	As delegated and authorized by Project Engineer/Engineering Manager.
Environmental Manager	Oversee and direct preparation of project environmental documents, obtaining required permits, and developing an environmental mitigation strategy. Develop project schedule and monthly manpower allocation for project duration. Monitor schedule and furnish updates. Manage Environmental activities to meet project milestones and budget. Initiate and oversee interagency coordination and project partnerships on environmental. Coordinate and direct all other specialty function managers to produce required Environmental documents to assure that the project meets the scheduled milestone dates. Oversee assembly of the final project Environmental documents. Implement quality control procedures to assure quality of delivered products. Develop commitment tracking system, and monitor commitments throughout project design and construction.	Direct activities of the I-90 Project Design Office Environmental Group to accomplish assigned tasks within authorized budget and schedule. Direct the activities of WSDOT Region and HQ support organizations and contractor resources assigned to Environmental tasks. Review project Environmental deliverables prior to issue; approve and/or recommend approval based on standard WSDOT procedures. Develop Environmental schedule and monthly manpower and budget estimate.

Project Position	Project Roles and Responsibilities	Project Authority
Assistant Environmental Manager	Support Environmental Manager in roles/responsibilities noted above.	As delegated and authorized by Environmental Manager.

1.6.2 Off-Site GEC Resources

The I-90 GEC, URS Corporation, provides resources to the project office from a variety of locations, primarily the Seattle office. GEC subconsultants also provide technical support through the GEC to the project office.

1.6.3 On-Site Non-GEC Consultants

On-site non-GEC consultants (CH2M HILL and PRR) provide level-of-effort technical support to the I-90 Project Design Office.

1.6.4 Off-Site Non-GEC Resources

Off-site non-GEC resources (WTI) provide primarily environmental technical support to the I-90 Project Design Office.

1.6.3 WSDOT Region and HQ Support

The I-90 Project Design Office interfaces with South Central Region staff and a number of specialty support offices both within the Region and WSDOT HQ. These key offices and their roles and responsibilities during the preconstruction phase of the project are summarized below. Additional interfaces occur for items such as administrative and human resources support.

WSDOT Regional Program Management Office. The Program Management Group manages the current biennial program, and develops future biennial programs. They coordinate all reporting activities, budget proposals, and changes with WSDOT HQ. Any changes to the project scope, schedule or budget documented on Project Control Forms by the I-90 Project Team will be processed through the Program Management Group. The Regional Program Management Office also supervises the Public Outreach Team and the Region communications staff, who provide support to and coordinate on communications issues with the I-90 Project Design Office Communications staff.

WSDOT Assistant Regional Administrator for Project Development. The Assistant Regional Administrator for Project Development provides overall design oversight, and is responsible for Regional approvals and concurrences for design documents as indicated in Chapter 330 of the WSDOT *Design Manual* (WSDOT 2009b).

WSDOT Assistant Regional Administrator for Real Estate. WSDOT Regional Real Estate Services performs and coordinates all real estate transactions for the department, including ROW acquisitions, and issues guidelines for all state agencies engaged in real estate activities covered by the Uniform Relocation Assistance and Real Property Acquisition Policies Act. For the I-90 Snoqualmie Pass East Project, they interact with

the USFS and US Bureau of Reclamation (USBR) to obtain the necessary needed easements for the project and purchases of private property necessary for the project.

WSDOT Assistant Regional Administrator for Construction. The Assistant Regional Administrator for Construction provides oversight for the region's construction program. Construction staff provide constructability reviews and PS&E input to the Region's design offices.

WSDOT Assistant Regional Administrator for Maintenance. Provides oversight of the regional maintenance program and the region Traffic Office. The Maintenance Office reviews project scopes and design to ensure constructability and maintainability.

WSDOT Regional Traffic Engineer. The Traffic Office evaluates collision data, traffic volumes and movements, and prepare a traffic analysis report for the I-90 Snoqualmie Pass East Project. They are preparing a traffic design, including illumination designs, Intelligent Transportation System designs, signing designs, and will review work zone traffic control plans prepared by the I-90 Project Design Office Engineering Group.

WSDOT Regional Utilities Engineer. The Project Utility Team supports the project by identifying utility conflicts, working with utility companies to resolve conflicts, and preparing various types of agreements needed for the project.

WSDOT Regional Plans Review Office. For the I-90 Snoqualmie Pass East Project, the Regional Plans Review Office is responsible for:

- Review of plans for approvals
- Facilitating review and approval of the ROW Plan
- Reviewing the PS&E package.
- Preparing and advertising for PS&E packages
- Reviewing and preparing addenda
- Reviewing, processing, approving, and recording design documentation files
- Coordinating with HQ Design

WSDOT Regional Materials Laboratory. The Regional Materials laboratory supports the project design by preparing the surfacing/resurfacing report, and the materials source reports for rock cuts and other potential materials sites. They review the pavement determination prepared by the I-90 Project Design Office Engineering Group.

WSDOT Regional Communications Office. The Regional Communications Office coordinates regional communication activities.

WSDOT HQ Public Information Office. The Public Information Office is responsible for supporting public information activities, and long range communication planning.

WSDOT HQ Bridge and Structures Architect. The State Bridge and Structures Architect is the primary author of the *I-90 Snoqualmie Pass East Corridor Architectural Guidelines* (WSDOT 2007a). The Architect provides guidance and review on bridge plans, retaining walls, and other architectural elements to ensure conformance to the approved architectural recommendations. Approval from the Architect is required on all retaining wall aesthetics per Design Manual 1130.04. During the design phase, structural designers should obtain the Architect's approval for any changes to architectural details shown on the approved architectural recommendations.

WSDOT HQ Bridge and Structures Office. The Bridge and Structures Office provides the full range of structural services required to provide safe, economical, aesthetic and functional structures for the state's transportation system. The Bridge and Structures Office manages and coordinates statewide with the regions for all planning, design, construction, preservation and maintenance functions.

For the I-90 Snoqualmie Pass East Project, the Bridge and Structures Office is responsible for developing the designs and preparing PS&E for the bridges and sign structures on the project. The Bridge and Structures Office will review the designs and PS&E for the retaining walls, snow support structures, and all other structural elements.

WSDOT HQ Consultant Services Office. The Consultant Services Office provides contract administration assistance to the I-90 Project Office Business Group.

WSDOT HQ Environmental Services. Environmental Services is a team of policy and science experts providing leadership to foster environmental stewardship and facilitate responsible implementation of the department's transportation services. The purpose of the Environmental Office is to ensure compliance with federal, state and local environmental laws; study, analyze and make determinations as to the impacts of transportation facility construction and operation on the environment; and provide guidance, direction, and solutions to meeting project delivery in a dynamic regulatory arena.

For the I-90 Snoqualmie Pass East Project, Environmental Services provides review and consulting services to the I-90 Project Design Office Environmental Group during the preparation of project environmental documentation, permitting, and mitigation planning.

WSDOT HQ Geotechnical Services Division. The I-90 Snoqualmie Pass East Project is expected to have significant cuts and/or fills, involve unstable slopes (e.g., landslide and rock fall areas), cross wetlands or other areas of unsuitable foundation base material, and include structures such as bridges and retaining walls. For these reasons, a significant geotechnical investigation and design effort is required and was executed by the GEC team supported by the I-90 Project Design Office Engineering Group. The WSDOT Geotechnical Services Division directed all field exploratory drilling, and is involved in the review of the geotechnical evaluation and summary of geotechnical conditions, as well as the project geotechnical documentation package provided by the GEC team. The Geotechnical Services Division assisted the I-90 Project Design Office

Engineering Group with the development of the GEC scopes of work and independent estimates of cost for the geotechnical task assignments.

WSDOT HQ Hydraulics and Water Quality Offices. The Hydraulics and Water Quality Offices ensure that environmental protection and compliance is achieved with respect to the region's water resources during the planning, design, construction, and operations of transportation facilities. For the I-90 Snoqualmie Pass East Project, they review and approve the Stormwater Reports (including hydraulic and temporary erosion and sediment control [TESC] features), provide technical support for the specification of best management practices, and review the PS&E package to ensure hydraulic and water quality compliance with all applicable regulations and overall safety of the roadway for the general public.

WSDOT HQ Right of Way Office. The ROW Office reviews all aspects of ROW, sundry site, access hearing, and any other plans associated with the acquisition or maintenance of property for State highway purposes. For the I-90 Snoqualmie Pass East Project, the office reviews the ROW engineering performed for the project by the I-90 Project Design Office, including the alignment and ROW plans, sundry site plans for Rocky Run and other sites, the monumentation map, the record of survey, and the permit to destroy. The office also provides expertise and support in working with USFS and USBR in implementing their respective ROW easement acquisition processes.

WSDOT HQ Roadside Development Office/Landscape Architect. The Roadside Development Office prepares and/or reviews grading plans, soil bioengineering, soil restoration, revegetation, permanent erosion control measures, environmental mitigation, and site reclamation design and development.

1.7 Project Phases

The I-90 Snoqualmie Pass East Project is actually the first phase of an overall project to improve a 15-mile corridor of roadway east of Snoqualmie Pass, from Hyak to Easton.

WSDOT started the environmental effort for the project corridor in 1998, developing environmental documentation, analyzing alternatives, and beginning preliminary engineering. WSDOT released the DEIS on June 10, 2005. In response to the DEIS, WSDOT received over 3,300 comments. Response to these comments were incorporated into the FEIS, which was published in August 2008. The ROD was issued in October 2008 by FHWA.

The Washington State Legislature provided \$387.7 million for the first phase of the project, as part of the 2005 Transportation Partnership Funding Package. During the 2007 Legislative Session, the Legislature approved an increase in total funding for this initial project to \$525 million to address projected escalation in engineering and construction costs, based on economic trends. This funding is being used to complete the FEIS for the project corridor, develop the design, obtain environmental permits, purchase the ROW, and construct the first 5 miles of improvements, from Hyak to Keechelus Dam,

as described in this PMP. The cost estimate for the entire project corridor varies considerably, depending on the design alternative selected and the year of construction. Funding levels and timing will determine project phasing and sequencing, and ultimately the total corridor cost.

The I-90 Snoqualmie Pass East Project described in this PMP has two separate stages: preliminary engineering and preconstruction activities, and construction. The focus of this version of the PMP is the preliminary engineering and preconstruction activities, specifically, preparing the environmental documentation and permits for the project; obtaining ROW certification; and developing the PS&E package required to advertise for, obtain bids from, and select a construction contractor. The PMP will be updated prior to approval of the 1B PS&E package to address activities during construction, contract closeout, and turnover to operations and maintenance.

Construction of Phase 1 will be accomplished in stages:

Phase 1A – I-90/Hyak to Crystal Springs
Phase 1A – Lake Storage Mitigation and Detour
Phase 1B – I-90/Hyak to Snowshed Vicinity – Add Lanes and Bridges
Phase 1C – I-90/Snowshed to Keechulus Dam – Replace Snowshed and Add Lanes
Phase 1D – I-90/Yellowstone Road to Hyak – Stormwater Retrofit
Phase 1E – I-90/Hyak to Snowshed Vicinity – Roadside Restoration and Fencing
Phase 1F – I-90/Snowshed to Keechulus Dam – Roadside Restoration and Fencing
Phase 1G – I-90/Hyak to Keechulus Dam – Salvage and Plant Supply

1.8 Measures of Success – Project Metrics

The overall objective of the I-90 Snoqualmie Pass East Project is to design, permit, and construct the required improvements to I-90 within the project budget, meeting the scheduled dates for Advertisement of the construction contract and major construction complete with the roadway open to traffic. The following metrics will be used to evaluate the project's performance in meeting this objective:

- Develop a constructible design that meets the purpose and need for the project stated in the DEIS and FEIS, as summarized in Section 1.1 of this PMP. Produce a design of sufficient quality to minimize PS&E addenda and change orders, and maximize the number of responsive bids.
- Complete the project within the overall approved budget and schedule.
- Build effective government-to-government and private-public partnerships that can serve as a model for future, similar projects, and effective means for communicating and coordinating project decisions with all stakeholders. The effectiveness of these relationships will be measured by the willingness of project stakeholders to take joint ownership of the solutions to problems encountered by the I-90 Project Team as they arise.

1.9 Operating Guidelines

The I-90 Project Team will be governed by the following overall principles. These principles will be incorporated into project processes and procedures.

Team Decision-Making Process. Each I-90 Project Design Office group will have the authority to make decisions within the authority outlined in Section 1.6; however, this authority comes with the responsibility to consult with each group that will be affected by the decision, identifying issues and concerns, addressing these issues and concerns, and coming to a mutual agreement on resolution of these concerns. When significant differences of opinion remain unresolved, the team will refer the decision to the Project Director for resolution. All final decisions will be supported by the entire I-90 Project Team.

Team Meetings. At the project level, the following key meetings currently occur:

- Weekly Operations Meeting (Monday mornings). The Weekly Operations Meetings are chaired by the Project Director and are attended by the Project Manager, Business Manager, Environmental Manager, Assistant Environmental Manager, Project Engineer/Engineering Manager, Assistant Engineering Manager, and the Communications Team Lead. The focus of the meeting is schedule compliance; this meeting also is used as a forum for discussion of issues requiring resolution or action, and to discuss needs from other I-90 Project Design Office groups. Information from these meetings is documented in a set of weekly meeting minutes.
- Monthly Project Review Meeting (MoPR). This meeting is chaired by the Business Manager; attended by the Project Director, the Environmental Manager, the Project Engineer/Engineering Manager; and the Project Manager. This meeting addresses schedule, risk management, change management, and budget (including earned value), with the focus of the meeting on cost control and earned value. Also, a “look-ahead” schedule is discussed, identifying the critical path, critical tasks, areas of risk and determining management strategies for those risks. The Risk Matrix is used to evaluate and prioritize risk mitigation.
- Interdisciplinary Team Meetings. Each month, the IDT is briefed on key project issues and status in a meeting that is chaired by the Environmental Manager. The IDT, composed of staff from WSDOT, the FHWA, USFS, USBR, USFWS, National Marine Fisheries Service, US Army Corps of Engineers (USACE), EPA, WDOE, WDFW, Washington State Parks, and Kittitas County, was originally convened by WSDOT to develop a preferred alternative to meet the purpose and need for the I-90 Snoqualmie Pass East Project, as described in Section 1.1. The IDT continues to serve in an advisory capacity to the I-90 Project Team.

- Monthly Safety Meeting. This meeting is a general office meeting attended by all I-90 Project Design Office personnel. While its main focus is related to safe work performance, this meeting also is used to convey information of general interest to all project personnel.
- Quarterly Project Report Meetings. The Project Director is required to make a quarterly presentation on the status of the I-90 Snoqualmie Pass East Project to the WSDOT Executive Oversight Committee. The focus of this meeting is project performance against authorized scope, schedule, and budget, with an emphasis on identification, avoidance, and mitigation of project risks, the active management of project changes and variances (e.g., avoidance, recovery), and the review/approval of change requests. The requirements for this meeting are further described in the WSDOT Project Control and Reporting Manual (WSDOT 2006).

In addition, each I-90 Project Design Office group may hold a variety of standing and ad-hoc meetings to discuss project issues and status, and to disseminate critical information and feedback from other sources (e.g., Weekly Operations Meetings, Quarterly Progress Reviews). These include Engineering Squad Leader Meetings, Environmental Team Meetings, and Business Group meetings.

Communication. The I-90 Project Team will use a variety of communication methods, including formal correspondence (e.g., letters, memos, reports, review, and comment records), emails, meetings, internet web pages, and Quarterly Project Delivery Reports. Formal correspondence and informal correspondence (e.g., emails) that significantly affect the project will be reviewed, approved, distributed, and controlled in accordance with the Communication Plan and Quality Assurance (QA) Plan. All project decisions will be documented by an appropriate means (e.g., formal correspondence, meeting minutes, emails entered into the project files) and distributed to all affected parties.

Manage Team Change. As the I-90 Project Team's level of effort need increases, staff hiring decisions will be made following the process described above. Anticipated changes in project scope, schedule, and budget will be clearly communicated to the team as they are identified, together with potential impacts to work assignments.

Manage Team Conflict. All members of the I-90 Project Team are expected to interact in a professional manner. Team members will attempt to resolve disagreements between themselves directly, recognizing that disagreements center on opinions, ideas and concepts, and not the individual. In those instances where significant differences cannot be resolved directly, the team will elevate the issue to the appropriate level of management for resolution.

2.0 Plan the Work

This section of the PMP describes the tools and procedures that will be used to manage the I-90 Snoqualmie Pass East Project during the preliminary engineering and pre-construction phase. These tools include: work breakdown structure (WBS); scheduling, budgeting, and cost tracking approach and software; value engineering and constructability reviews; risk management and change management plans; project communication and document control plans; project quality plan; and procurement and contract management plans.

2.1 Work Breakdown Structure (WBS)

This section defines the WBS and the specific tasks, sub-tasks, and deliverables associated with the I-90 Snoqualmie Pass East Project. It is based on the work necessary to complete pre-construction. This PMP addresses only the pre-construction phase of the project; therefore, the project WBS is currently limited to preliminary engineering and right of way tasks. The PMP will be updated again prior to approval of the Phase 1B PS&E package to include elements that apply to construction, contract closeout, and turnover to operations and maintenance.

Pre-construction elements for the I-90 Snoqualmie Pass East Project are summarized below.

2.1.1 Project Initiation

The project initiation tasks provided the initial framework to define the project. These tasks included the Project Summary and its related subtasks (Project Definition, Design Decision Summary, and Environmental Review Summary). These initiation tasks have been completed for the 15-mile corridor.

2.1.2 Project Management

Project management tasks consist of management and oversight functions that must be performed to guide the project to successful completion. These include Project Management Plan, consultant administration, and project administration.

2.1.3 Communications

Communication tasks consist of an annual update to the Communication Plan for design-related field work, Construction Communications Plans and public events such as the FEIS Open Houses.

2.1.4 Environmental Documentation and Permits

Environmental Documentation, Mitigation, and Environmental Permits include all of the activities required to complete NEPA/SEPA processes required for the project, and to

develop and obtain the required federal, state, and local environmental approvals and permits necessary for the project.

Interagency and governmental coordination are required to reduce the risk associated with the environmental documentation, mitigation planning and regulatory permit activities on the project. The following activities are involved with this coordination effort:

- **Interdisciplinary Team.** The IDT was originally created to evaluate and recommend a NEPA/SEPA EIS preferred alternative design solution for the I-90 Snoqualmie Pass East Project. The IDT has expanded and evolved to an advisory panel whose purpose is to share information and communication within agencies that have a nexus (funding, permitting, land-use action) on the project. These agencies include: WSDOT, FHWA, USFS, USBR, USFWS, National Marine Fisheries Service, USACE, EPA, WDOE, WDFW, Washington State Parks, and Kittitas County.
- **Technical Committees.** The WSDOT-led Technical Committees are subgroups of the IDT that address areas of specific risk and work out problem areas of the design in small interagency groups that specialize in the subject area and can work with WSDOT to provide problem-solving opportunities. Technical Committees include stormwater, wetland mitigation, and wildlife monitoring plan and implementation.
- **Tribal Coordination.** WSDOT is committed to working with tribes to understand and address their areas of concern and to communicate project progress and activities.
- **Signatory Agency Committee.** The project is subject to the NEPA/SEPA/404 Merger Agreement and must coordinate with the Signatory Agency Committee at three standardized concurrence points. The project completed Concurrence Point #3 in March 2008.
- **Interagency and Public Partnerships.** These activities include working with resource agencies and conservation, recreation and other groups to provide meaningful partnerships and thoughtful avoidance, minimization, and mitigation measures. Together these partnerships help to create a design that provides context sensitive solutions in meeting project objectives.

Environmental Documentation. The following activities are being performed to prepare the environmental documentation required for the project:

- The DEIS, FEIS, and ROD have been completed for the I-90 Snoqualmie Pass East Project. A revised Draft Section 4(f) document and evaluation is complete.

- ESA Compliance is required on this project with USFWS and National Marine Fisheries Service. WSDOT/FHWA initiated formal consultation with the Services, and a Biological Assessment and Biological Evaluation were submitted through the FHWA and the USFS. WSDOT received a Biological Opinion (BO) from the USFWS in September 2008 regarding the Spotted Owl, Bull Trout, and Marbled Murrelet.
- The I-90 Project Team consulted with the Department of Archeology and Historic Preservation under state and federal laws including Section 106 of the National Historic Preservation Act. It is expected that most sites can be avoided; however, in the case of inadvertent discoveries, early coordination with Tribes will reduce risk of delays and/or added cost. The historic Keechelus Lake Snowshed will be removed by the project. The DAHP accepted a mitigation plan for impacts associated with removing the snowshed.

Mitigation and Commitments. The following mitigation and commitment activities are necessary for the project:

- **Wetlands mitigation.** The proposed roadway improvements will fill all or part of 27 wetlands, totaling approximately 10 acres. To compensate for these unavoidable impacts, WSDOT has proposed compensatory mitigation involving both wetland restoration and preservation. The mitigation sites are located near the project area, within the same basin as project impacts, and are described in the *I-90 Snoqualmie Pass East Project Wetland & Aquatic Resources Conceptual Mitigation Plan* (WSDOT 2007b).
- **Connectivity landscape design, wildlife exclusion methods, and wildlife monitoring.** As noted in Section 1.1, a key goal of the I-90 Project is to facilitate habitat and hydraulic connections across I-90. Adequate connections between habitats on either side of I-90 are necessary for the continued health of the project area's diverse ecosystems. To achieve this goal, WSDOT plans to replace short bridges with longer, higher clearance bridges and replace narrow culverts with wider, fish-friendly culverts. An overcrossing for wildlife will be installed. WSDOT will install fencing to direct and channel wildlife toward these crossing features. WSDOT plans to evaluate the effectiveness of the planned design elements by conducting both baseline (pre-construction) and post-construction monitoring of wildlife within the project corridor.
- **Recreation parking facility replacement.** The I-90 Project will cause both temporary and permanent impacts to recreational parking and access to the sno-park, rest area, and campground facilities within the corridor. Temporary impacts will be a reduction in parking spaces and changes in access routes due to the planned use of these facilities as staging and stockpiling areas, as well as access route changes to accommodate construction activities. These temporary impacts will be greatest during the late spring, summer, and early fall, when construction is taking place. No net loss of winter recreational parking is anticipated. In later,

unfunded phases of the construction, the permanent closure of the Price Creek Interim Rest Area and Price Creek Sno-Park are planned. WSDOT plans to mitigate for the loss of the Price Creek Sno-Park, as described in the *I-90 Snoqualmie Pass East Recreation Mitigation Plan* (WSDOT 2007c).

- **Construction compliance monitoring.** Permits issued for construction will likely have various conditions that must be met; for example, permits will likely require WSDOT to construct both temporary and permanent facilities to treat stormwater and reduce water quality impacts. Compliance with these permit conditions will be a requirement of the construction contract advertised for bid by WSDOT. An ongoing program to monitor compliance with these permit conditions will be required.
- **Commitment tracking.** In addition to permit conditions, permits and environmental documents for the I-90 Project will include various commitments related to environmental mitigation and management activities. These commitments will be tracked by the I-90 Project Environmental Manager, who will be responsible for ensuring that the appropriate actions are implemented.

Permits. The following regulatory permits will be required for the project:

- Clean Water Act
 - WDOE – Section 401 Certification with Temporary Modification of Water Quality
 - WDOE – Section 402 (NPDES)
 - USACE – Section 404 Individual Permit
- WDFW Hydraulic Project Approval
- WDNR Forest Practices Permit
- Kittitas County Permits
 - Washington State Shorelines Management Act Substantial Development Permit
 - Floodplain Development Permit
 - Growth Management Act – Critical Areas Permit
 - Noise Variance
- USFS easement and access permits
- USBR Crossing Permit(s)
- Other required permits

2.1.5 Design Development and Documentation

The tasks that make up the design process for the I-90 Snoqualmie Pass East Project include development of project data through design documentation. The design calculations and decisions made during the development of the design are documented under the design documentation tasks.

Key design issues involved with the I-90 Snoqualmie Pass East Project that will be addressed during design development include:

- **Bridges and Structures.** The design will require a number of bridges and/or bridge-type structures for wetland and creek crossings and habitat connectivity, as well as a replacement snowshed to address the potential impact of avalanches. The design of these structures is a key element of the project.
- **Rock Slopes.** A significant amount of work is associated with the drilling, blasting, excavation, and reinforcement of the rock slopes along the project corridor. The geotechnical investigation required to support these elements of the design is one of the earliest site-work activities.
- **Avalanche.** The project encompasses an area of roadway that has historically presented avalanche hazards. Approaches to dealing with these hazards (e.g., snowsheds, moving the roadway alignment, avalanche barriers above the roadways) are a key design consideration.
- **Hydraulic and Stormwater Design.** The roadway along the project corridor is located in between a mountain slope and a large reservoir lake. This reduces the space available for more traditional best management practices for the treatment of stormwater runoff (e.g., grassy strips, detention ponds). Additionally, the roadway is subject to large seasonal variations in flow due to freeze/thaw cycles that reduce permeability and significantly increase runoff during the spring. These factors present significant challenges to treating the stormwater to improve its quality prior to discharge.
- **Retaining Walls.** Several retaining walls are needed for the I-90 Snoqualmie Pass East Project.
- **Staging and Construction Access.** Due to the location of the project between a mountain slope and a large reservoir lake, maintaining traffic as well as construction access will be a challenge in the design.

2.1.6 Plans, Specifications, and Estimate Preparation

The design developed above is translated into the PS&E package necessary to bid and award the project under contract plans sheets preparation, contract specifications development, and construction estimate development.

2.1.7 Design Reviews

Constructability reviews and the final review and approval of the PS&E package are performed under these tasks. Formal design and constructability reviews are planned as the design reaches the 30%, 60%, and 90% completion. These reviews are a key component of the project quality plan, as well as the project risk management and change management processes. They are described in further detail in Section 4.1.3.

2.1.8 Construction Permits

Third-party approvals necessary to begin construction occur under construction Permits.

The I-90 Snoqualmie Pass East Project requires a highway easement from the USFS and a crossing permit from the USBR. Obtaining these easements will require additional processing and review time after the environmental documentation is completed to ensure that plans are consistent with the USFS Forest Plan. This process will be facilitated with the USBR and USFS by the WSDOT HQ liaison staff.

2.1.9 Right of Way Acquisition

Land purchases and third-party approvals necessary to begin construction occur under right of way acquisition.

The highway easement process for Right of Way on adjacent National Forest lands is a significant effort that falls within these tasks. This process will be facilitated with the USBR and USFS by the WSDOT HQ liaison staff.

2.1.10 Contract Advertisement and Award

The steps necessary to advertise the PS&E package for bid, and to select and award a contract to a construction contractor, are captured under contract advertisement and award.

2.2 Project Schedule

This section describes the software and the process used to develop, maintain, and track progress of the project schedule, which is maintained within the project files. Appendix A presents a high-level summary of the original, overall project baseline schedule.

Executive Order E 1032.00 requires that project managers develop and maintain a project schedule. Project managers use the schedule as a tool to define task sequencing and duration, milestones, assign responsibility, and to report project status. Achieving agreement as to how the scope will be executed takes a significant effort. Only when the project management team has reached this agreement can the project proceed. The schedule is intended to be:

- A tool to properly plan and coordinate work
- A measure of the team's performance against time
- A means of identifying problems as early as possible
- A means of determining whether time extensions are appropriate
- A means of tracking expenditures in relation to progress

The schedule is a necessary tool to successfully manage any project. In order to do this, the schedule must be complete to the degree that it includes all significant activities, but only the detail needed to manage the activities to the level desired by the management team.

The I-90 project is a large, complex project. Therefore it is reasonable to expect the I-90 schedule to be a large complex schedule. In order to successfully develop a schedule for a large project, it is absolutely necessary that sufficient resource time is planned (both team leads and managers) for the schedule building and maintenance process. It is critical to the successful delivery of the project, "on time and on budget". Without a good schedule, neither can occur.

2.2.1 Scheduling Software

Primavera Project Management, a computer-based "critical path method" scheduling software, is being used to develop and maintain the schedule for this project. Primavera Project Management is now the "level playing field" software, used by WSDOT statewide, as its scheduling software.

Engineering consultants will be required to use current versions of Primavera Project Management, to ensure uniformity and compatibility with the project schedule. The I-90 Snoqualmie Pass East Project Business Manager will monitor the consultants to verify scheduling software is properly used and resulting schedules and updates meet contractual requirements.

2.2.2 Schedule Development

The project schedule was developed using the following steps. This process initially involved a high degree of effort weekly, in addition to full day scheduling meetings with all disciplines at the table. The level of effort currently required for schedule development and maintenance is now greatly reduced.

- **Further Define Tasks/Activities.** The deliverables portion of the WBS presented in Section 2.1 was reviewed, and additional detail added to the tasks and subtasks as required.
- **Define Predecessor/Successors.** The I-90 Project Team then reviewed the tasks in the WBS and established a logical work-flow, identifying tasks that are predecessors/successors to other tasks, and identifying tasks that can occur independently from other tasks.

- **Establish Durations/Milestones.** Next, the I-90 Project Team established task durations for each task, based on assessment of project requirements, and identified dates for milestones based on these durations. Differences between projected completion dates and major milestones identified in program commitment documents (e.g., legislative project approval) were identified for resolution in further steps. Measurable milestones were established at regular intervals to support the utilization of earned value, as described in Sections 2.3 and 2.7.
- **Develop Baseline Schedule.** A baseline schedule was developed for the full 5-mile corridor, with the understanding that upon completion, the project would be broken into up to six separate construction phases.
- **Finalize Baseline Schedule.** The finalized baseline schedule for the 5-mile corridor was then endorsed by the management team, published, and is maintained within the project Document Control system as a controlled document.
- **Develop Preliminary Engineering (PE) Phases:**
 - **Draft Baseline Schedule.** Draft baseline schedules were developed for phases 1A, 1B, and 1C.
 - **Finalize Baseline Schedule.** The baseline schedules for 1A, 1B, and 1C were then finalized and are maintained within the project Document Control system.
- **Assign Resources and Costs.** Once the baseline schedules for these phases were developed, the project team determined the resources that would be required to complete major project activities within the given duration, and the costs associated with those resources.
- **Review and Revise.** As the development of the schedule progressed, the resource requirements and associated costs were then compared to the resources available, and adjustments made to the resources and task durations as required. During this step, the project team worked to resolve discrepancies between the resources required and those that are available, and between the project completion date and previous commitments. Those discrepancies that could not be resolved by the project team have been flagged as potential changes, to be addressed as described in Section 2.7.
- **Integrate Cost Data Into Schedule.** Once resource loading was completed, cost data was integrated into the schedule. In order to provide more accurate projections of cost (aging), both schedule and cost analysis is done within Primavera P6.



2.2.3 Schedule Maintenance

Each week, in preparation for the Weekly Operations Meeting, schedule status meetings are held between the Scheduler, and discipline activity leads, to assess the status of critical activities. During the Weekly Operations Meeting, a “watch list” of activities, and the amount of float the schedule is showing for these activities, is discussed. This enables critical activities (and variances from baseline) to be discussed among the Project Management Team.

At the Weekly Operations Meeting, the Scheduler will provide a “watch list” of critical activities to start or complete over the next 8 weeks, or activities with little or no float. These activities are discussed, with an action plan determined to mitigate any “slipping” activities. New activities to address upcoming work will be added as required. At the time of the Monthly Project Review Meeting, a copy of the schedule will be saved as a unique electronic file within the project electronic filing structure, and as a hard-copy document within the project file (Document Control), allowing progress to be compared on a month-to-month basis.

Variances from scheduled completion dates will be evaluated using the project change management processes described in Section 2.7, and appropriate mitigation or corrective actions implemented. The estimated actual percent complete and the scheduled percent complete for each task will be used in the calculation of earned-value, as described in Section 2.3.

2.2.4 Construction Schedule

A part of the preliminary engineering (PE) effort is the development of construction schedules. The same software and generally the same methodology are used to establish critical construction activities and working days, which feed into the cost estimate. Multiple construction phases, the project area being on a mountain pass with highly variable weather conditions, and adjacent to a large irrigation reservoir with significant water elevation fluctuations, contribute to the challenge of developing these schedules.

2.3 Project Budget and Cost Tracking

This section describes the development of the project budget and the processes used to track project expenditures against the budget.

The objective of cost management is to track and measure variances from the baseline; and identify areas where corrective action is required to reverse trends. The I-90 project is currently using the cost analysis features of Primavera P6 to track, monitor, and project costs. This method creates a basis and relationship between planned cost expenditures based on scheduled work to be completed and actual cost of work performed. Cost controls are created through a combination of processes including, but not limited to role loading of WSDOT labor and expense, all other indirect project costs, and consultant services costs (including GEC task orders and other agreements).

2.3.1 Project Budget

The overall baseline project budget is presented in Section 2.6.1. As noted in Section 2.7.1, the project budget originally established by the Legislature has been updated to establish a current project baseline budget.

Continued management of budget performance, including estimated cost of the project at completion, is maintained through a combination of reporting programs, scheduling, and accounting software applications. Cost program applications integral use of TRAINS, FIRS, Primavera 6, Microsoft Excel and TEIS.

Evaluation of scheduled and budgeted costs is completed monthly in accordance to implemented Project Management and Reporting System (PMRS) guidelines effective of July 1, 2008.

As the project progresses, the Project Management Team is provided cost reports showing estimates at completion plus scheduled cost to complete, thus reflecting the projects earned value. These reports are reviewed monthly by managers. Issues related to variances between scheduled costs and actual costs are evaluated by the responsible discipline manager for resolution strategies. If no resolution is determined, and a potential cost impact is identified, the Project Management Team implements the Change Management process (Section 2.6). For amendments to task order documents (TODs) that exceed \$50,000 or 10% of the original budget, the responsible discipline manager is required to complete a Project Change Management Form (PCMF), describing the change in detail. The PCMF must be completed within 10 business days of the date of the WSDOT discipline manager's concurrence letter requesting the amendment.

Project cost reports give project managers the ability to quickly identify project activities that are experiencing actual costs in excess of the budget, thus giving the manager the ability to implement appropriate mitigating and corrective actions which in turn, can minimize negative cost impacts to the project.

The Construction portion of the updated baseline has been developed using the WSDOT standard CEVP®. CEVP® is a state-of-the-art; systematic project review and risk assessment method that identifies and describes cost and schedule risks, and evaluates their effect on the available project estimate. CEVP® performs a project cost and schedule validation, and develops updated cost and schedule ranges using probabilistic risk assessment. The process examines, from the very beginning, how risks can be lowered and cost vulnerabilities can be managed or reduced. The result of the CEVP® process is a range of costs associated with the project. These costs are shown on a probability curve, based on the likelihood and confidence in the presented cost. CEVP is a tool to assist in validation of costs, when crucial decisions are yet to be made and the specific risks cannot be priced exactly. The CEVP® is done at a minimum, annually until the major construction contracts are issued for bid.

2.3.2 Project Costs

Project costs are retrieved from TRAINS, on a monthly basis utilizing WSDOT applications including FIRS and DataMart. The accounting data, current period costs, are verified and transferred to Primavera 6. Consultant expenses, WSDOT Labor, and other costs are reviewed in detail to ensure accuracy before integration into cost management applications.

I-90 cost management includes the Preliminary Engineering (PE), Right of Way (RW), and Construction (CN) phases. (Construction cost management at this time is limited to best available information on projected aging of CN costs). Cost management, at the highest level is managed based on organizational areas, which include Business, Engineering, Environmental, and Communications.

The costs within these disciplines are assigned to WSDOT established Work Operation Codes (WorkOp codes); these costs are extracted from the WSDOT accounting system, and assigned to all activities within the project schedule and cost management. Earned value and estimate at completion calculations are reviewed, validated, and managed at the WorkOp level.

The I-90 project has 3 primary cost areas. At the highest level, these costs consist of WSDOT Labor, Other Direct Costs (ODCs) and Overhead.

WSDOT Labor. WSDOT labor costs are obtained from the WSDOT accounting system, primarily via Work Operation codes. The accuracy of reported WSDOT labor costs is dependent on WSDOT employees charging to the correct Work Operation code. It is the responsibility of the discipline team leads to assure that correct Work Operation codes are being used by their staff.

Other Direct Costs (ODCs). The primary ODCs for the I-90 Snoqualmie Pass East Project are costs associated with consultants (such as the GEC), and agreements. These contracts stipulate that progress is reported in earned value, to the I-90 Project Business Manager. This earned value is required to be submitted with each monthly invoice.

Overhead. The most significant overhead cost is Redistribution. Redistribution is the recovery of project support costs, based on WSDOT labor and expenses. These costs range from 3% to 10% (approximate). There are also other, less significant costs under overhead, such as travel expenses and per diem.

2.3.3 Reporting and Aging

As a part of the internal Monthly Project Review Meeting (MoPR), described in Section 4.1.2, total project costs to date are combined with the scheduled remaining cost to complete the project, creating the estimate at complete (i.e., the project's overall earned value). The output is a monthly report, the Master Cost Analysis Review (Appendix B), which includes the Earned Value elements described below. This report is typically

provided to the Project Management Team at the Monthly Project Review Meeting as a tool to assess recent cost and schedule performance. Monthly aging is generated from the P6 Program, which provides a detailed distribution of monthly costs based on resource and cost loading. Exhibit 2-1 summarizes the cost planning process.

WSDOT Program Management requires reporting of I-90 projected (scheduled) spending on a monthly basis. The data requirements include summary information, by month, through the end of the 2013–2015 biennium. The data from the detailed aging processed from P6 is consolidated to a summary total for PE and RW. CN aging comes from the Construction schedule. This information is then transferred manually to the Microsoft Excel aging spreadsheet provided by SCR Program Management.

2.3.4 Project Cost Tracking

The earned-value method of cost analysis will be used to track and evaluate project costs, as described in Section 2.7.2. To develop earned value calculations, the I-90 Project Team must provide accurate assessments of schedule progress and costs to the Business Office, each month. These assessments are also used to develop monthly aging reports as stated above.

Each discipline within the project office will coordinate with consultant and agency managers doing work for I-90, to get status assessments of the work these groups are performing for WSDOT.

Earned Value Reporting

The I-90 Business Office collects all cost related data to generate forecast reports utilizing the PMRS Cost Management Tool, Primavera 6.

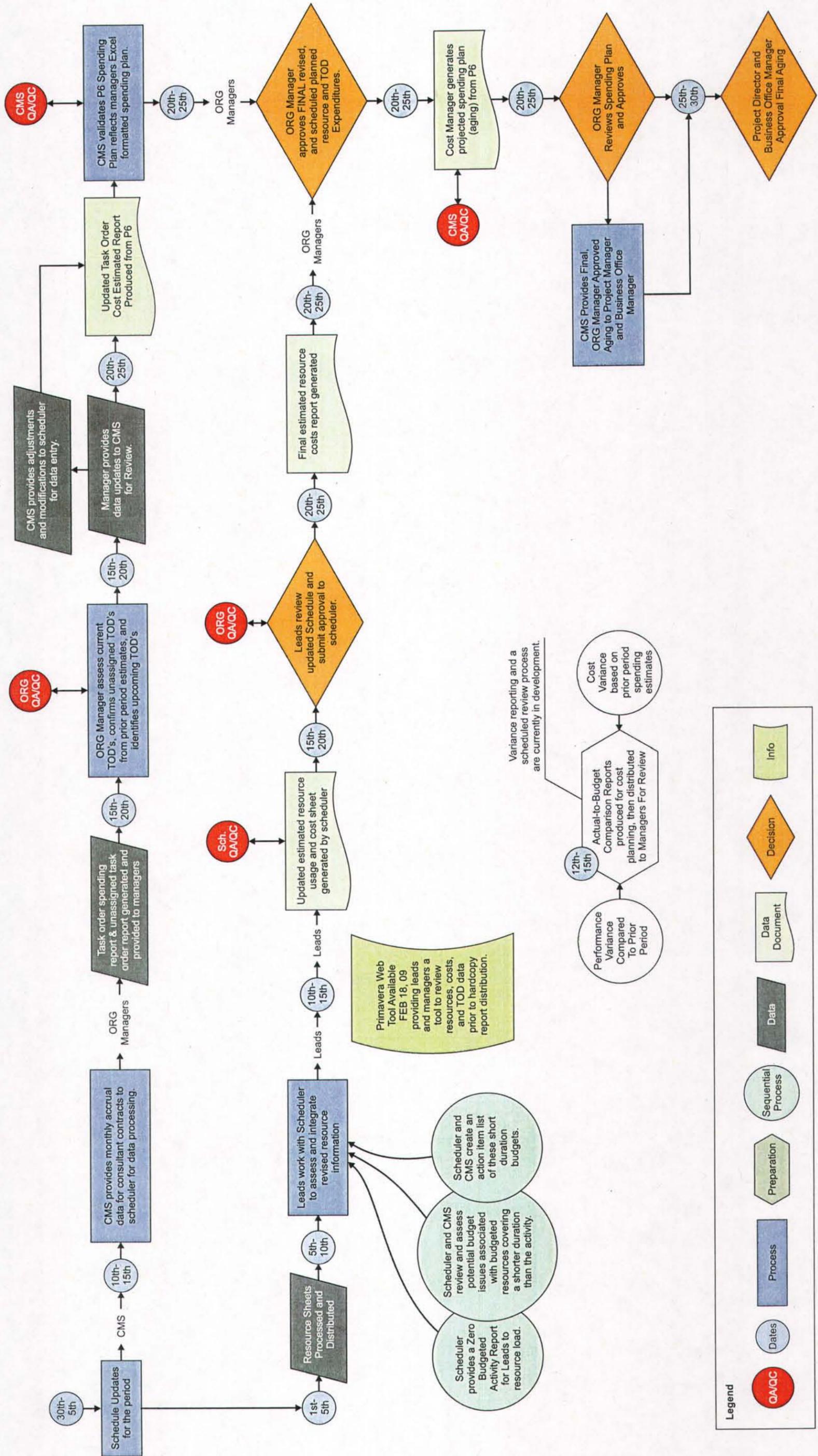
For cost analysis, the key elements are the earned value (EV), and the actual cost (AC) of work performed. The earned value is the percentage of the task that has been completed, multiplied by the total estimated cost for that task.

Earned Value Analysis serves as an early warning system for cost or schedule variances that should be resolved, as these indicators reflect potential project cost overruns and/or unplanned schedule delays.

The cost variance (CV), formulated as $(CV = EV - AC)$ is a cost indicator reflecting if the actual project expenditures are in excesses of value of work scheduled.

The earned value calculation is processed on one of the following detail levels: Phase, Organization, or Work Operation code. The cost performance index ($CPI = EV/AC$) is a valuable measure of budget efficiency, which can assist managers in quickly identifying critical cost elements such as cost overruns. Values above 1 indicate under budget; below 1 indicates over budget. Excessively high values over 1.0 may also indicate a problem and will be investigated.

Exhibit 2-1
Cost Planning Process Flow Chart



Schedule analysis has two elements—progress along the critical path, and overall schedule progress. For quantitative analysis, the key elements are the earned value (EV) and the planned value (PV). The planned value is the budgeted cost to perform the work that is scheduled to be completed at a given time. The schedule variance ($SV = EV - PV$) is a quantitative measure of project progress versus the schedule. If the schedule variance is positive, the project is ahead of schedule, and if it is negative, the project is behind schedule. Progress versus schedule can also be expressed as a schedule performance index ($SPI = EV/PV$). Values above 1 indicate ahead of schedule; below 1 indicates behind schedule.

These earned value numbers are calculated each month using the approved, resource loaded schedule and actual project labor and direct cost data. Variances identified by these calculations are discussed and addressed at the Monthly Project Review Meetings described in Section 4.1.2. See Appendix B for an example Earned Value Cost Spreadsheet.

Projected Construction Performance. The majority of the total cost for the I-90 Snoqualmie Pass East Project is associated with construction. The cost for these activities is greatly influenced by the work performed during the preliminary engineering and pre-construction activities. For example, if the design of a roadway element changes to require more steel or concrete, the cost to engineer the roadway may not vary from the original estimate; however, the cost to construct the roadway will likely vary considerably. As described above the CEVP process is used to validate these construction cost estimates.

2.4 Value Engineering and Constructability Reviews

This section describes the Value Engineering processes that will be employed on the project and the plan for conducting periodic constructability reviews.

2.4.1 Value Engineering

A Value Engineering session was held in late November 2006 to evaluate the existing project design. The I-90 Project team has incorporated the recommendations from this Value Engineering session as described in Section 1.1. Additionally, a Construction Optimization workshop was held utilizing GEC construction experts. This workshop focused on construction methods and schedule to evaluate potential savings and to validate current design assumptions. Future Value Engineering sessions will be considered (e.g., concurrent with the 60% Design Review).

2.4.2 Constructability Reviews

Constructability reviews are the process used to validate that the design can be built using standard industry methods; to ensure that the design incorporates features that support the needs of the construction contractor, such as access and staging areas; and to verify that the developing design package is complete, and provides all of the information needed to bid and execute the project.

The 30% constructability review is complete. Further reviews will occur at the 60% and 90% complete stages (see Appendix C). The reviews will be conducted by members of the I-90 Project Team, WSDOT regional staff members, HQ Plans Review representative, GEC leads, and experienced construction managers who are independent of the design process.

2.5 Risk Management Plan

The I-90 Project Team has implemented a systematic process used to identify, analyze, and respond to project risk throughout all phases of the project described in the WSDOT Policy on Project Cost Risk Assessment, which is described on the following web site: <http://www.wsdot.wa.gov/Projects/ProjectMgmt/RiskAssessment/>

The risk management measures that have been implemented for the I-90 Snoqualmie Pass East Project include completing an annual CEVP® workshop. The results of these workshops are documented in I-90 Project CEVP® Reports, found in the project file.

The output from the risk management process followed for the I-90 Snoqualmie Pass East Project is a risk register that identifies and describes the project risks to be monitored and controlled; prioritizes the risks by analyzing their probability of occurrence and their impacts; provides a response strategy and actions to be taken; and assigns responsibility for monitoring the risk and taking the appropriate actions to an I-90 Project Team member. The current risk register is maintained in the project file and monthly updates are included in the Monthly Progress Review package as a controlled document.

2.5.1 Risk Identification

The CEVP® process primarily focuses on identifying and quantifying risks that will affect project cost and schedule, with the end product being a statistically-based estimate of the most probable project cost. In addition to the risks considered by this process, the I-90 Project Team regularly identifies other potential project risks that may not have been fully captured by the limitations on the risks considered in the I-90 Project CEVP® process. These additional risks are included in the set of risks considered for the project risk register.

2.5.2 Risk Prioritization

The initial set of project risks developed above includes more than 50 potential items that pose some risk to the ability to complete the project within budget and schedule. A number of these risks are related to construction execution, and are not affected by activities performed during the pre-construction phase.

For purposes of prioritization, the I-90 Project Team will actively track, monitor, and report on any risk where the probability weighted impacts exceed \$1 million (e.g., an event with a 10% probability of occurrence and a \$10 million total impact has an

probability weighted impact of \$1 million). To estimate the effective cost of schedule delays, the I-90 Project Team will use the rule of thumb that a one-month delay during the PE phase will represent an additional cost of \$1 million per month of delay. If a delay occurs before construction starts and delays most of the project cost, the estimated impact is \$2 million per month of delay.

2.5.3 Response Strategies and Actions

For each of the initial risks carried forward into the risk register, the I-90 Project Team has determined the most appropriate risk mitigation strategy, together with appropriate actions to implement that strategy, in the following order of priority:

- **Avoid.** Where possible, the project has been planned to avoid (or eliminate) the risk or to protect the project objectives from its impact by changing the technical approach, or adding schedule “float” by accelerating completion of certain tasks, while maintaining the balance of scope-schedule-budget.
- **Mitigate.** In those instances where risks cannot be avoided, response actions have been developed to reduce the probability and/or consequences of a risk event to an acceptable threshold. These responses have been developed with an emphasis on early actions to reduce the probability of the risk occurring or to reduce its impact on the project, versus response actions to repair the consequences of the risk event. Mitigation costs have been considered, and have been determined to be appropriate, given the probability of the risk and its consequences.
- **Accept.** When a risk event could not be avoided, mitigated, or transferred with a suitable response action, the team has decided to accept the risk. In these instances, the response action noted in the risk register is a contingency plan to deal with the risk if it occurs.

2.5.4 Responsibility for Monitoring/Tracking/Action Implementation

With response strategies and actions identified, the I-90 Project Team identified a discipline manager responsible for monitoring each of the initial risks (e.g., watching project activities to determine if trigger point is near or has been reached), and for implementing the chosen response strategies and actions (e.g., ensuring that mitigation measures are built into project activities). This individual is generally the I-90 Project Management Team member with responsibility for the area involved (e.g., Environmental, Engineering, and Business).

2.5.5 Risk Management Plan Implementation and Maintenance

Sections 2.5.1 through 2.5.4 describe the actions taken to develop the initial risk register for the project; however, risk management is an ongoing process, not a one-time event. It is closely linked with the process for monitoring performance against the baseline budget

and schedule, for identifying and managing changes, and for quality assurance (QA) and quality control (QC). For example, if a risk is triggered, change is likely to occur. Failure to implement a risk response action, such as a mitigation approach, may result in a large potential impact later in the project. Similarly, QA audits and QC reviews (e.g., review of project work products) should verify that mitigation measures have been implemented, and that risks have not been triggered.

During Monthly Project Review Meetings, the project risk register is reviewed. The I-90 Project Management Team verifies that risk events have not been triggered, and if they have, that the pre-planned response actions have been implemented. The Management Team reviews the effectiveness of the pre-planned risk management strategies and actions that have been implemented. Where response actions are in progress, the I-90 Project Management Team evaluates their effectiveness and implements revised actions if they are not effective. The I-90 Project Management Team will also determine if the risk that has been triggered has resulted in a change to the scope, schedule, or budget versus the project baseline, and if so, implement the Change Management process described in Section 2.7. The outcome of the monthly review is documented in the report from the Monthly Project Review Meeting described in Section 4.1.2. The I-90 Project Management Team will re-evaluate the Risk Register and update as required to add new risks, drop old ones that are no longer active, move dormant risks up to the active list, or move risks to change management.

The I-90 Project Management Team will compare the Risk Register to the Project Change Control Log and reconcile as appropriate—changes may have triggered risks or generated new risks. The Project Manager will be responsible for maintaining the Risk Register, and for overseeing and reviewing implementation of the risk management and response actions outlined in the Risk Register.

2.6 Change Management Plan

A disciplined system for identifying and managing changes to the project has been developed and implemented. The current Change Management Plan for the I-90 Snoqualmie Pass East Project focuses on the steps necessary to identify and manage changes during the pre-construction phase of the project. The plan will be updated prior to the construction phase to address aspects of change management related to construction of the project.

The foundation of change management is the up-front identification of the project baseline: the approved scope, schedule, and budget for the project, laid out in sufficient detail to guide project execution to the intended project end state. Once the project baselines have been established, the change management process includes:

- Monitoring project performance against the baseline and identifying variances
- Evaluating actual or apparent variances from the baseline
- Determining a course of action to address the variance

- Documenting the decision on a course of action
- Implementing mitigating measures, corrective actions, and lessons learned

2.6.1 Project Baselines

Initial Approved Project Baseline. The initial approved project baseline is summarized in Exhibit 2-2.

**Exhibit 2-2
Initial I-90 Snoqualmie Pass East Project Baseline**

Element	Value	Basis
Scope	Reconstruct I-90; MP 55.1 to MP 59.9	2005 TPA legislation - 2006 Leg Fin Book
Schedule - Environmental Documents	July 2007	SCR Milestone list - 2006 Leg Fin Book
Schedule - Project Ad Date	October 2009	SCR Milestone list - 2006 Leg Fin Book
Schedule - Open to Traffic	June 2015	SCR Milestone list - 2006 Leg Fin Book
Budget - Preliminary Engineering	\$28,000,000	2005 TPA legislation - 2006 Leg Fin Book
Budget - Right of Way	\$5,000,000	2005 TPA legislation - 2006 Leg Fin Book
Budget - Construction	\$354,700,000	2005 TPA legislation - 2006 Leg Fin Book
Budget - Total Project	\$387,700,000	2005 TPA legislation - 2006 Leg Fin Book

Updated Project Baseline – November 2008. Due to the iterative nature of the WSDOT project identification, initiation, and approval process, many of the elements of the above baseline were developed independently from each other, and in some instances potential discrepancies between the assumptions underlying each individual baseline element were not resolved. Therefore, the first step in the change management process was to identify and resolve these discrepancies, which led to a revised project baseline in 2006. Additionally, as design progressed, cost estimates were refined as risks were mitigated. The baseline was revised again in November 2008, as illustrated in Exhibit 2-3. The I-90 Snoqualmie Pass East Project will be managed to this baseline or subsequent baselines as approved by the legislature or WSDOT headquarters.

Future Updates to Project Baseline. Additional updates to the project baseline are anticipated, based on potential revisions to the project funding profile. As the revisions occur, changes to the project baseline will be managed as described in this section. A PCRf was submitted in February 2009 with milestones and budgets for each of the anticipated subphases (1A–1G). This PCRf proposes changes to overall PE, RW, and CN budgets and to the overall OC (operationally complete) date. This PCRf provides additional milestones and CN budget by subphase. If approved, these budgets will become the new baseline for each subphase and change management will apply for changes in scope, schedule, and budget at the subphase level.

Exhibit 2-3
Updated I-90 Snoqualmie Pass East Project Baseline
 (currently approved as of 11/17/08)*

Element	Value	Basis
Cost – Engineering, Environmental, Communications	\$48,200,000	2008 Leg Fin Book, adjusted by 9/08 PCRf
Cost - Right of Way	\$5,800,000	2008 Leg Fin Book, adjusted by 9/08 PCRf
Cost – Construction	\$491,000,000	2008 Leg Fin Book
Cost – Total Project	\$545,000,000	2008 Leg Fin Book
Schedule - Environmental Documents (ROD)	October 2008	Actual
Schedule – Project Ad Date	October 2009	Project Schedule – December 2006 Baseline
Schedule – Open to Traffic	June 2015	Project Schedule – December 2006 Baseline
Scope – Overall	Description of Preferred Alternative	IDT Preferred Alternative Recommendation Memo (June 2006), as modified by Value Engineering recommendations
Scope – Alignment	Alt 4: Shoreline	IDT Preferred Alternative Recommendation Memo (June 2006)
Scope – Gold Creek	Option A	IDT Preferred Alternative Recommendation Memo (June 2006)

*For the purposes of this PMP update, the baseline approved in November 2008 is summarized in this table as the most recently approved baseline. As discussed below, a PCRf was submitted in February 2009, which, if approved, will amend this baseline.

Project Scope of Work and Cost Estimate. The conceptual design upon which the pre-construction and construction cost and schedule are based is described in Section 1.1. This conceptual design has been described in sufficient level of detail such that key control parameters (e.g., bridge span lengths, construction material quantities, constructability issues) can be identified and used to subsequently monitor project performance against the baseline.

Integrated Resource Loaded Project Schedule. The cost and schedule baseline will be summarized in a resource-loaded schedule for the I-90 Snoqualmie Pass East Project that integrates the engineering, environmental, and communications effort. This schedule will be developed using the WSDOT standard WBS, customized to the project. For each key, definable feature of work, the schedule outlines both a duration and cost estimate for that feature.

2.6.2 Monitor Project Performance Against Baselines

With the project baseline established, the first step in the I-90 Snoqualmie Pass East Project change management process is to monitor project performance against the baseline described in Exhibit 2-2. This involves two inter-related elements: 1) monitoring the progress of the preliminary engineering and pre-construction phase of the project against the resource-loaded schedule, and 2) evaluating the design, as it is

developed, for conformance with the assumptions that underlie the construction schedule and cost estimate and the project scope approved by the Legislature.

Preliminary Engineering/Pre-Construction Performance. Each month, the I-90 Project Management Team evaluates the performance of work being performed in the preliminary engineering and pre-construction phases. This performance is typically expressed using a variety of values, as described in further detail below.

2.6.3 Evaluate Actual/Potential Variances from the Baseline

For the I-90 Snoqualmie Pass East Project each of the negative variances (increases in cost or schedule) as well as positive variances (e.g., decreases in cost or schedule due to an implemented or proposed change in design, improved efficiency in engineering, etc.) will be evaluated. This evaluation:

- “Drills down” to identify the nature of the variance (e.g., more effort required to execute baseline scope, actual scope performed differed from baseline)
- Identifies the root cause (under-estimated level of effort required to perform scope, baseline not well understood, better design provided versus “good enough”)
- Outlines potential corrective actions/mitigation measures, and ongoing monitoring that should be implemented
- Analyzes the magnitude of impacts of both the variance and any potential corrective actions/mitigation measures (e.g., value of cost increase/decrease, length of schedule acceleration/extension). The cost impacts of schedule slips are carefully considered, as schedule slips can have very significant cost impacts for this project

The evaluation is led by the I-90 Project Design Office group responsible for managing the work element where the variance occurred, supported by other I-90 Project Design Office groups as required. Progress reports on variance evaluations are provided during the weekly operations meetings described in Section 4.1.1, and at the Monthly Project Review Meeting (Section 4.1.2). Based on the evaluation described in Section 2.7.4, the I-90 Project Management Team will decide whether to accept the variance as a change and incur its impacts, or to implement corrective actions and mitigation measures and incur the related impacts.

2.6.4 Document Evaluation and Decision Regarding Variance

The I-90 Project Team has instituted an I-90 Project Change Management Form (Appendix D) and Project Change Control Log, to document and approve the identification, evaluation, and disposition of project variances. The I-90 Project Change Management Form is a project-specific version of the standard WSDOT Project Control

Form presented in Appendix C of the WSDOT Project Control and Reporting Manual (WSDOT 2008a). Each I-90 Project Change Management Form is uniquely identified and tracked within the Project Document Control system. Each change is summarized in a Project Change Control Log, which is a simplified presentation of the information from the I-90 Project Change Management Form.

Changes are managed at the project level until such time as it is clear that the overall scope, schedule, and budget will be impacted and WSDOT PCRf thresholds are met. For example, an estimated \$1 million increase in out-year construction costs may be carried on the Project Change Control Log through several months of design, until there is reasonable certainty that no offsetting cost savings will be realized. When it is recognized that corrective actions (mitigation measures) will not prevent the impacts, or off-setting cost or schedule impacts will not occur, the changes are documented using the standard WSDOT Project Control Form, and submitted for review and approval as required by the procedures described in the WSDOT Project Control and Reporting Manual (WSDOT 2008a).

Depending on the impact of the change, the approval process may require actions outside of the I-90 Project Team. The Project Control and Reporting Manual (WSDOT 2008) outlines the required approval levels and actions for PCRf changes.

2.6.5 Implement Mitigation Measures, Corrective Actions, and Lessons Learned

The process described above may identify mitigation measures or corrective actions to deal with a variance. These measures will be implemented, and their effectiveness monitored during each Monthly Project Review Meeting, until the variance is fully dispositioned (e.g., eliminated by the corrective actions or the final impacts are determined and a resulting change accepted).

The I-90 Project Team identifies potential lessons learned based on the root cause analyses performed for each variance. These lessons learned are evaluated during each Monthly Project Review Meeting, and disseminated to the I-90 Project Team. A running summary of lessons learned will be kept by the Business Manager. The I-90 Project Management Team also review the Project Risk Management Plan as a part of this monthly process, and update it as appropriate to reflect variance root causes and lessons learned.

2.7 Project Communications Plan

This section of the PMP describes the plans for communicating critical information regarding the I-90 Snoqualmie Pass East Project to various stakeholders. These include the general public, local governments, tribes, other agencies, and the WSDOT and consultant personnel involved in the execution of the project.

2.7.1 External, Internal, and Construction Communications Plans

A critical factor in the successful delivery of any complex highway improvement project is formulating and implementing clear and effective communication plans. Successful communication plans disseminate project progress and results, encourage public participation, make more efficient use of limited resources, and ultimately help accomplish the goals of the project.

The I-90 Project Team has detailed external, internal, and construction communication plans that serve as programmatic documents to guide future, event-specific, and non-specific (e.g. emergent/unforeseen) communication efforts to the general public and internal stakeholders. The communication plans include the following elements:

- Goals and objectives
- Strategies, tactics, and tools to be used to meet goals and objectives
- Key messages and risks
- A proactive plan to implement the strategies, tactics, and tools
- Matrices that identify the internal and external stakeholders participating in the communications loop, their roles and responsibilities, vested interests, potential issues, expectations, and appropriate modes for communication
- Performance measurements to validate the effectiveness of the communication effort
- An estimate of the resources needed to implement the communications plans

Project status and needs that cannot be addressed with project-specific resources must be communicated to WSDOT HQ and region personnel.

Open, honest, and timely communication between the external public and internal project stakeholders is a critical component to ensure that the I-90 Snoqualmie Pass East Project will be successfully executed.

To ensure consistent communications with external stakeholders, the *Style Guide and Graphic Standards* (WSDOT 2007d) was developed. The guide presents templates and document examples that contain formatted data, including meeting agendas, report covers, tables, charts and other graphic elements.

2.7.2 Internal Communications Plan

Open, honest, and timely communication between internal project stakeholders is a critical component to ensuring that the I-90 Snoqualmie Pass East Project will be successfully executed. In order to assure successful delivery of this project, it will be

necessary for the project team to accurately inform each other of their needs, updates and timelines. Project status and needs that cannot be addressed with project-specific resources must be communicated to WSDOT HQ and Region personnel. Guidelines and policies relevant to the day-to-day operation of the project must be communicated. Project staff needs to know about project status, accomplishments, and future project activities. The processes that will be used regularly to facilitate internal communications are summarized in Exhibit 2-4.

These processes are predominantly face-to-face, and are supplemented with other communications channels (e.g., email, memo) as needed to address specific issues or communications needs. In addition to the regular team meetings described in Section 1.9, additional means of communication are in place to identify and resolve issues.

Consultant Monthly Status Reports and Status Teleconferences. Each consultant Task Order requires the consultant to submit a monthly status report for the task, including an updated project schedule, earned value calculations, and a synopsis of the work performed during the month. More frequent status updates may be required via teleconference, depending on the task duration and the level of coordination required between the task and other project activities.

WSDOT Support Group Monthly Status Reports and Status Teleconferences. The point of contact for each WSDOT Support Group with an active task on the I-90 Snoqualmie Pass East Project will be asked to submit a monthly status report for the task via email, including an updated schedule; the estimated percent complete; and a synopsis of the work performed during that month. More frequent status updates may be required via teleconference, depending on the task duration and the level of coordination required between the task and other project activities.

Group Meetings. Each I-90 Project Design Office group (i.e., Engineering, Environmental, Business, and Communications) holds periodic group meetings to discuss project status, communicate technical information, and discuss and communicate other topics pertinent to the operation of the project.

Discipline Coordination Reviews. These reviews are described in further detail in Sections 2.8.3 and 4.1.3. They occur as required to ensure that project technical details are communicated and coordinated between the various contributors to the project. This communication process is predominantly written. A draft document is circulated among interested/involved parties for review and comment, and comments are documented in writing and provided to the author/preparer of the draft document. While predominantly a written process, comments involving discrepancies in interpretation or details of project components must be resolved, and this process often involves face-to-face discussion and interaction.

Exhibit 2-4
I-90 Snoqualmie Pass East Project Internal Communication Processes

What?	To Who / By Who	How?	When?
Team Management			
Project-Specific Guidelines and Policies	To: I-90 Project Team By: I-90 Project Director	Email; project documents; Weekly Operations Meeting; Group meetings	As Needed
Cost and Schedule Status			
Overall Project Status	To: HQ and Region By: I-90 Project Director	Quarterly Project Review and Executive Oversight Committee meeting	Quarterly
	To: I-90 Project Director By: I-90 Project Mgt. Team	Monthly Project Review Meeting	Monthly
	To: I-90 Project Team By: I-90 Project Director	Monthly Safety Meeting	Monthly
Project Activity Status: General Activities	To: I-90 Project Director By: I-90 Project Mgt. Team	Monthly Project Review Meeting	Monthly
Project Activity Status: Critical Path, High Risk, Change Threatening, or Critical for Coordination	To: I-90 Project Director and other I-90 Project Sr. Staff members By: I-90 Project Mgt. Team	Weekly Operations Meeting	Weekly
Project Activity Status: I-90 Project Design Office Activities	By: I-90 Project Team To: I-90 Project Mgt. Team	Group meetings; Issue-specific meetings	Weekly; As Required
Project Activity Status: Offsite Consultants	By: Consultant Leads To: I-90 Project Mgt. Team	Monthly Status Reports; Status Teleconferences	Monthly; As Required
Project Activity Status: WSDOT Support Groups	By: Support Group POCs To: I-90 Project Mgt. Team	Monthly Status Reports; Status Teleconferences	Monthly; As Required
Coordination of Technical Efforts			
Project Technical Decisions: General	To: I-90 Project Team By: I-90 Project Team	Discipline Coordination Reviews	As Needed; at 30/60/90% Reviews
Project Technical Decisions: Critical Path, High Risk, Change Threatening, or Critical for Coordination	To: I-90 Project Director and other I-90 Project Sr. Staff members By: I-90 Project Mgt. Team	Weekly Operations Meeting	Weekly
Project Technical Decisions	To: I-90 Project Mgt. Team By: I-90 Project Team	Group Meetings; Issue-specific meetings; draft and final documents	Weekly; As Required
Project Activity Status: Offsite Consultants	By: Consultant Leads To: I-90 Project Mgt. Team	Monthly Status Reports; Status Teleconferences	Monthly; As Required
Technical Information between Internal Organizations	By: Environmental or Engineering Staff To: Engineering or Environmental Staff	Request for Information (RFI) database	As required; status of outstanding RFIs reviewed weekly
Project Activity Status: WSDOT Support Groups	By: Support Group POCs To: I-90 Project Mgt. Team	Monthly Status Reports; Status Teleconferences	Monthly; As Required
Coordination of External Communications			
Plans for External Communications	By: I-90 Project Mgt. Team To: I-90 Project Mgt. Team	Weekly Operations Meeting	Weekly
Content of External Communications: Outgoing	By: I-90 Project Mgt. Team To: I-90 Project Mgt. Team	Draft Meeting Agendas and Discussion Topics	As Required
Content of External Communications: Incoming	By: I-90 Project Mgt. Team To: I-90 Project Mgt. Team	Meeting Minutes	As Required

2.8 Quality Plan

QA is the process of ensuring that work is performed in a professional and accurate manner, meets WSDOT expectations, limits risk, complies with laws and regulations, and meets accepted industry practices. QC is the evaluation of the individual components of a project to monitor the accuracy and completeness of the work, specifically the performance of document and design reviews, and the planning and execution of project file and performance audits.

The mission of the quality program is to establish, maintain and continually improve the efficiency of quality procedures that are consistent with project-specific requirements. The quality program is designed to ensure that technical tasks: (1) result in improved work products and services, (2) are performed according to accepted industry practice, (3) are consistent with emerging technologies, (4) comply with laws and regulations, and (5) conform to WSDOT QA policy.

The *Quality Management Plan* (“QMP”) (WSDOT 2008b) is composed of 8 sections modeled from the ISO 9001 quality standard developed by the International Organization for Standardization. This organization, established in 1947, is a non-governmental body that promotes international standardization to facilitate the effective exchange of goods and services between nations.

It is important to define the work products applicable to the project. Our work involves planning, analysis and/or design associated with the natural and/or man-made environment, and our work products are words and pictorial representations of our ideas, recommendations, conclusions and designs. The quality processes and procedures applicable to these work products are delineated primarily in Section 1, Quality Systems, and Section 2, Work Product Control of the QMP.

2.8.1 Definitions

Quality of a service is the consistency of that service with the professional standard of care and the client’s requirements.

Professional standard of care or **standard of professional practice** is the prevailing standard of professional practice as exercised by any other similar professional, on a similar project, under similar circumstances, in the same geographical area. By law (state law in the United States), professionals delivering services under professional liability (as opposed to product liability) are required to prepare those services in compliance with the professional standard of care. In professional liability cases, the expert testimony by an expert witness (other similar professional) is used by the trier of fact (a judge or jury) to establish the professional standard of care against which the allegedly deficient service is tried.

Quality control (QC) is the organized system of actions taken by the project team under the responsibility of the Project Manager to verify that ongoing quality has been achieved. Quality control is exercised to minimize defective deliverables.

Quality assurance (QA) is the organized system of actions taken by project-independent people (who are not part of the project team) to verify that quality control is effectively exercised by confirming objective evidence of quality-control actions. It provides confidence that the deliverable will satisfy the given requirements for quality.

Quality management is establishing, monitoring and improving the effectiveness of quality control and quality assurance including the organization and responsibility matrix of the corporation. Quality management defines the managerial aspect of the entire quality system.

2.8.2 Project Personnel Responsibilities

Project Director. The Project Director is the most important person in assuring the success of the quality program, and is responsible for implementing the QMP. The Project Director has the authority and responsibility to set up and execute the project to make sure that it: (1) addresses all scope of work elements, (2) achieves a level of technical quality for all technical deliverables commensurate with contract terms and conditions, and (3) is completed on schedule and within budget.

Quality Assurance Manager. The Quality Assurance (QA) Manager reviews and updates the QMP and Procedures as required and provides training to project staff. The QA Manager assures that all work products are developed in accordance with the project quality procedures in this QMP. The QA Manager may perform periodic audits to ensure quality procedures are being followed on an on-going basis throughout the design process.

Organization Managers. The Organization Managers (e.g., Project Engineer/Engineering Manager, Environmental Manager, Business Manager, and Communications Manager) are responsible for implementing the QMP for the activities under their direction. They are responsible for assigning the Squad Leader/Task Leaders for project tasks or groups of tasks. They are the approval authority for the issue of deliverables from the I-90 Snoqualmie Pass East Project.

Squad Leader/Task Leader. The Squad/Leader/Task Leaders are responsible for all design or technical functions, including schedule, budget and quality within a specified area or discipline. They are also responsible for initiating and monitoring general quality processes, specifically, Detail Checking, ITR, and DCRs. For purposes of the I-90 Snoqualmie Pass East Project, the Squad Leader/Task Leaders are the individuals assigned by the Organization Managers to lead a task or groups of tasks, generally within a single discipline area (e.g., Roadways, Bridges and Structures, Wetlands).

Originator. The Originator is the individual who is the primary author of the work product to be reviewed.

Independent Technical Reviewer. The Independent Technical Reviewer is defined as someone who has not been involved with the creation of the material to be reviewed, nor with determining the means, methods, and approaches to be used in developing the

material to be reviewed. Independent Technical Reviewers at a minimum are qualified by education, experience, and certification to be the Originator of the document; preferably, they have prior, extensive experience with similar activities on related projects.

Checker. A checker is someone who has not been involved with the creation of the material to be reviewed, and who has the requisite skills and experience to perform a check of accuracy of the work that has been performed, as determined by the Squad Leader/Task Leader.

Document Control Lead. The Document Control Lead is responsible for maintaining and storing all design and quality records; assisting in the proper distribution of documents; and tracking the progress and return of review documents.

2.8.3 General Quality Processes

Detail Check. Detail checking focuses on the accuracy of the work product (e.g., math checks for calculations, verifying that the correct inputs have been used, ensuring that drawing call-outs and references are correct and appropriate), conformance with appropriate formats and the I-90 Project Style Guide, and technical edits of deliverables, assuming that the chosen approach is correct.

Independent Technical Review (ITR). ITR focuses on the overall approach to and execution of the work, ensuring that the work product has been developed using appropriate methods and reasonable assumptions, meets industry standards, and draws logical and supportable conclusions.

Discipline Coordination Review. A review conducted on project documents to verify that they are consistent with other, related documents, as well as consistent with project design objectives and criteria. As an example, environmental permit applications are reviewed by Engineering to ensure that they properly reflect the design, and bridge and structure designs are reviewed by roadway engineers for consistency with the roadway geometrics.

Acceptance Review. The purpose of Acceptance Review (AR) is to verify that documents prepared under alternative, approved QA/QC procedures are acceptable for use by the I-90 Project. The deliverables provided by off-site consultants and/or WSDOT support groups working under their own approved QA/QC Plan are subjected to a modified review process. This process verifies that 1) the deliverables meet the requirements of the scope of work provided to the originating organization, and 2) the deliverables are consistent with other project documents.

Constructability Review. To develop a quality project, WSDOT uses a series of reviews at predetermined stages of project development. These reviews, called constructability reviews, attempt to ensure that the project development process is on schedule, the project definition and estimates are correct, the project is buildable and maintainable, and that the project documents are biddable. These reviews assure that

construction-related expertise is incorporated into the design. Qualified construction managers will complete these reviews, adding practical construction considerations to the design.

30%/60%/90%/Final Plans, Specifications, and Estimate (PS&E) Review. A review conducted on all project documents complete or in process to date as a package, conducted at established points in the project based on the status of the design (e.g., 30% complete). The reviews will be scheduled in advance, and will typically involve a multi-day, face-to-face, interdisciplinary meeting, with teams of reviewers evaluating all available project documents.

Control of Nonconforming Products. A system is established for reporting and evaluating nonconformances to specified requirements, and approved procedures identified through means other than planned procedures (i.e., any of the other QA review functions - detail checks, independent technical reviews, discipline coordination reviews, acceptance reviews). The procedure is applicable when nonconforming items, services, or activities are identified by any staff or quality assurance personnel during normal working activity.

Corrective and Preventative Actions. A system is established to correct and prevent systematic issues likely to cause reoccurrence of nonconforming product.

Initiate Audit Process. Internal Quality Audits shall be conducted periodically. Its purpose is to verify the establishment of a project central file, project quality assurance file, and the correctness and completeness of the initial required quality documentation, including the project management and quality assurance plans.

Response to Project Audits. The Project Manager shall evaluate and schedule any appropriate corrective actions and document their response on the audit finding report within 30 days of receipt of the audit. In the case of significant conditions adverse to quality, the cause of the condition shall be documented and corrective and preventive action shall be taken to prevent reoccurrence.

2.8.4 Business Office Quality Control Procedures for Cost Information from WSDOT Systems

The Cost Analysis Lead is responsible for obtaining cost information from WSDOT systems, discipline managers, and task leads, in the development of costs, including historical reviews and future projected costs. Monthly, cost data sheets are provided to each task lead within each discipline, for the purpose of developing aging projections for future expenditures.

These cost data sheets are returned to the Cost Analysis Lead, who reviews the data, manually configures for importing or exporting, and enters modifications into cost areas of the schedule, where appropriate. At this point, a final report of scheduled costs is provided to the appropriate discipline manager for validation. All cost and budget reports developed within the Business Office, regardless of reporting tools used, are considered

draft until verified by each discipline manager, through a dated signature confirming their review and acceptance of information presented. Once the scheduled costs to complete have been validated by the discipline responsible for that aspect of cost, an independent review is performed within the Business Office; including review by the Business Manager. The independent reviewer can approve reviewed datasheets and documents used for internal reporting and distribution, through an initialed and dated copy of the report. These cost analysis guidelines apply to both WSDOT Employees and Consultants, and adhere to guidelines presented in Section 2.3 Project Budget and Cost Tracking of the PMP.

External I-90 reports distributed outside of the I90 Project office must be reviewed and approved by the Business Manager, and the Project Director.

2.8.5 Business Office Quality Control Procedures for Contract Management

The Consultant Management Lead is responsible for the review, maintenance, payment, and revisions to contracts related to consultant services. All current consultant contracts are Task Order driven, under Master Agreements. Task orders are managed for the life of the project through this database portal. The database is maintained by the Consultant Management Lead and periodic independent reviews are conducted by available Business Office administrative staff, who are pre-approved by the Business Manager to conduct QA/QC. These contract management guidelines apply to both WSDOT Employees Consultants and are governed by WSDOT Consultant Management Process and Procedures. The processes and procedures adhere to the guidelines presented in Section 2.9 of the PMP.

Some contractual elements are specifically managed by the Business Manager, such as Master Agreements, and agreements with governmental agencies (such as GCAs). Master Agreements for on-call consultants are managed by WSDOT Headquarters Consultant Services.

2.9 Procurement and Contract Management

An agreement is used any time funds are exchanged between WSDOT and another entity (government agency, private company, other), for work such as engineering, governmental support activities, public involvement, or other work performed by either entity. The work may require participation by WSDOT, or the entity, at the request of either. The work may also be needed as a result of Federal, State, or local laws.

A participation agreement is required to contractually accommodate the work to be done by either or both entities. Participation agreements that would be expected to be used on the I-90 project are generally Governmental (GCA) or Non Governmental (UC).

The Business Manager is responsible for agreement initiation, review and approval of the Agreement Package, and the forwarding of agreement packages to WSDOT Headquarters, Contract Management, for finalization of the agreement.

For the duration of the agreement, the Business Manager and Contract Manager Lead monitor, submit supplements as required, approve invoices for payment, and at agreement end, commence closure of the agreement.

All processes for agreement and task order processing conform to WSDOT Regulations for Consultant Management. The Business Office maintains documentation regarding the Agree Process, and Desk Instructions for GCA, UC, and Task Orders.

2.10 Document Control

The I-90 Document Control Policy & Procedures process has been established to define the infrastructure, process, and procedure for the management of all I-90 Snoqualmie Pass East Project (Project) data. The policy for the Project office specifies the process that will be used to ensure that all significant aspects of Project documentation are retained and easily retrievable. In addition, it is equally important to insure the exchange of current and accurate information, both internal and external.

Documents / data that will be maintained as Controlled Documents, at the discretion of Project managers will be submitted to document control. Documents which have been approved in accordance with the Quality Management Plan, and distributed as directed by the responsible Discipline Manager, will be maintained as Controlled Documents.

Controlled Documents are stored within the I-90 Data Vault, which is a folder that contains PDF versions of Controlled Documents for the Project. The Project Data Manager (Document Control Lead) will manage the electronic file for the "I-90 Data Vault" to store Controlled Documents.

I-90 managers will determine which documents need to be designated as Controlled Documents. The "I-90 Data Vault Approval" stamp, filled out and signed by a manager, indicates that the appropriate QA/QC process has been done, and verifies the document has been reviewed and approved for submittal into the I-90 Data Vault. No document will be entered into the I-90 Data Vault without this signed stamp.

All Project staff will have read-only access to Controlled Documents within the I-90 Data Vault, via Expedition. The Project Data Manager (Document Control Lead) has full access to Controlled Documents within the I-90 Data Vault, but these documents can only be moved or revised with the written approval (I-90 Data Vault Stamp) of an I-90 manager. Any revisions must go through the appropriate QA / QC requirements.

Hard copies of vault documents will be located within the Document Control filing system. All requests for hard copies of any document within I-90 Document Control, must be submitted to the Project Data Manager (Document Control Lead).

2.11 Transition Control Plan

The I-90 Project Management Team is in the process of developing a "Transition Plan," which includes the following elements:

- **Phasing Out of Consultant Resources.** Planning is currently underway to efficiently phase out Consultant resources as work force needs diminish. This will be a phased process that will occur between now, and the ad date for the third construction phase (1C). The objective is to phase out our Consultant staff in a manner that enables meeting committed ad dates for the project, and provides co-located Consultant employees with sufficient opportunities for obtaining employment elsewhere.
- **Project Office.** The direction of the I-90 Office, after completion of the Preliminary Engineering (PE) for phase 1B and 1C is currently not known. The I-90 Project Director is working with SCR management staff to determine the direction that provides best management of the project during construction, while PE on later phases is still in development. A part of this decision is where the actual I-90 Project Office will be located.
- **Preliminary Engineering Phase to Construction Phase.** Much of this will depend upon the strategy for the project office as described above. This will include moving WSDOT staff that has been working on the PE effort, into roles in the Construction phases, to obtain valuable experience in construction administration. This will benefit both the individual, and SCR. Efficient transfer of project information to those working in construction administration, and continuing consistent and efficient workflows for the processes currently in place within the I-90 Office will be important factors in the Transition Plan.

Management during construction phases and transitions will be addressed in future PMPs.

- **Construction Phase**
- **Closeout of Construction Phases**
- **Construction Phase to Maintenance**

The following elements will be a key part of the above activities:

- **Rewards and Recognition.** Continue to reward and recognize accomplishments as a team that contribute to the success of the project, in accordance with WSDOT guidelines and requirements.
- **Lessons Learned.** Utilize the WSDOT “Lessons Learned” database, and process to continually review and incorporate lessons learned through the project, benefitting the project, SCR, and WSDOT as a whole.
- **Demobilization.** A significant piece of demobilization will be closing out contracts and agreements associated with the PE phase of the project. This will include financial closure, and finalization and archiving of project documentation in accordance with WSDOT and I-90 Project Office requirements. This element

will be continually revised throughout the PMP process through PE and Construction.

3.0 Endorse the Plan

Executive Order E 1032.00, Project Management, requires that project team members and specialty groups “perform the roles and responsibilities as defined in the project-specific project management plan” and “endorse the [project management] plan.” The Executive Order also requires that Senior Managers and Executives “review and endorse the project management plans for each project.” Endorsements can be found in the original June 2007 Project Management Plan. This revision does not change roles or responsibilities so another endorsement was not necessary.

4.0 Work the Plan

This section of the PMP describes the processes that will be used to control project performance, including budget, schedule, scope, and the implementation of critical processes.

4.1 Design Management

The primary project management controls that will be used to guide and direct the project include a weekly coordination meeting, monthly project review meeting, and milestone (30%, 60%, and 90%) project reviews. Each of these items is described in further detail below.

4.1.1 Weekly Coordination Meeting

Each Monday morning, the I-90 Project Management Team meet to review the status of ongoing activities and actions necessary to coordinate the efforts of the project. These meetings are the primary structured means of communicating activity status and support needs between the I-90 Project Design Office groups. Emergent issues requiring action and resolution are identified and discussed, and actions assigned.

4.1.2 Monthly Project Review Meeting

Each month, following monthly financial close (e.g., when Labor and ODC cost data are available from the WSDOT accounting system), the Business Manager will request schedule updates from each of the I-90 Project Management Team, current through the date of financial close. The Business Manager will use these data to perform earned value calculations described in Section 2.7.2 for each task, and the project as a whole. After these preliminary data have been developed, the I-90 Project Management Team will meet to review the following items:

- Cost data for the tasks under their direction
- Task progress versus the schedule (e.g., estimated percent complete, earned value)
- The current Project Risk Register, to verify that triggering actions have not occurred, or if they have, that the appropriate responses are underway
- The current Change Control Log, to verify that all changes have been identified, and that appropriate response actions are underway

The results of the preliminary earned value analysis will be either validated, or corrections made based on the input of the I-90 Project Management Team. The finalized results from this meeting will be documented in a set of meeting minutes with an updated schedule, earned value estimate, and estimated cost-at-completion attached. Any required revisions to the Risk Register and Change Control Log will be noted. These minutes will be entered into the Document Control system as a controlled

document, and will form the basis for revisions to other controlled documents (e.g., Risk Register) as required. Once each quarter, the output from this meeting will serve as the input into the preparations for the Quarterly Project Review with WSDOT senior management.

4.1.3 Project Reviews at 30%, 60%, and 90% Completion

As the I-90 Snoqualmie Pass East Project reaches certain overall completion milestones, the project team will perform a set of activities designed to assess the performance of the project as a whole. These activities, which will take place as the project reaches 30%, 60%, and 90% complete, will include:

- Discipline Coordination Review of all project documents for internal consistency, as well as consistency with project design objectives and criteria
- Constructability Review of the overall design
- Independent validation/verification by the review team that the project has reached the appropriate completion milestone (e.g., it is 30%, 60%, or 90% complete)
- Update to the CEVP® Report, including an updated construction estimate and schedule based on the actual design to date, and review/revision of the project risk register

Appendix C identifies the expected progress for various activities that will typically be achieved when the project is 30%, 60%, and 90% complete. This list will be used to identify the points within the overall project schedule when these reviews will occur. The reviews will be scheduled in advance, and will typically involve a multi-day, face-to-face, interdisciplinary meeting, with teams of reviewers evaluating all available project documents. To support this, each document will be made available to the review team in hard-copy form in a version or revision that is uniquely associated in the Document Control system with the review (e.g., a controlled version, such that any changes made to the document after the review meeting occur in a different, uniquely identified version or revision). Comments to these documents will be documented using the review comment forms and process described in Section 2.8.

4.2 Construction Management

This section will be provided in a later revision to address activities required for construction, contract closeout, and turnover to operations and maintenance prior to approval of the PS&E package.

4.3 Environmental and Compliance Plan

Three separate plans are being developed:

- Construction Permit Compliance Plan
- Salvage and Revegetation Plan
- Post-Construction Monitoring Plan

These plans will ensure compliance with commitments made to WSDOT partners and will be developed collaboratively between the environmental and engineering groups.

4.4 Project Reporting

In addition to the outputs from the project control activities described in Section 4.1, the I-90 Project Team will participate in a Quarterly Project Review with senior WSDOT management, as described in the *WSDOT Project Control and Reporting Manual* (WSDOT 2006).

5.0 References

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Appendix A

I-90 Snoqualmie Pass East Project Summary Baseline Schedule

I-90 Snoqualmie Pass East Project		Preliminary Engineering		Gantt Chart (2008-2011)																							
WBS	Activity Description	Start	Finish	2008				2009				2010				2011											
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4								
Hyak to Keechelus Dam 5-Mile																											
E09009B.PE.AA.02	Consultant Administration	01-Dec-05	13-Dec-10	[Bar]																							
E09009B.PE.AA.03	Project Management	01-Dec-05	19-Apr-06	[Bar]																							
E09009B.PE.EV.17	Environmental Documentation	01-Dec-05	20-Oct-10	[Bar]																							
E09009B.PE.EV.18	HtoKD Mitigation Plans	01-Dec-05	24-Mar-11	[Bar]																							
E09009B.PE.EV.19.01	HtoKD Pre-Construction Permits	05-Jan-06	23-May-08	[Bar]																							
E09009B.PE.DS	Preferred Alternative Identified	05-Jul-06		[Dot]																							
E09009B.PE.DS	Begin Preliminary Engineering	01-Dec-05		[Bar]																							
E09009B.PE.DS.01	Project Summary	01-Dec-05	16-Sep-08	[Bar]																							
E09009B.PE.DS.02	Cost Risk Estimate & Management	01-Dec-05	21-Nov-08	[Bar]																							
E09009B.PE.DS.05	Value Engineering	21-Aug-06	13-Feb-08	[Bar]																							
E09009B.PE.DS.06	Roadway Materials Documentation	01-Dec-05	07-Jul-08	[Bar]																							
E09009B.PE.DS.07.01	Geotechnical Program	05-Jul-06	09-Jun-09	[Bar]																							
E09009B.PE.DS.08.01	Structural Site Data	05-Jul-06	26-Dec-08	[Bar]																							
E09009B.PE.DS.10	Roadway Materials Documentation	01-Dec-05	04-Mar-09	[Bar]																							
E09009B.PE.DS.11	Preliminary Engineering R/W	01-Dec-05	21-Jul-09	[Bar]																							
E09009B.PE.DS.12	Hydraulics	08-Sep-06	31-Mar-09	[Bar]																							
E09009B.PE.DS.15	Traffic Design	01-May-06	02-Sep-08	[Bar]																							
E09009B.PE.DS.15	Work Zone Traffic Control (WZTC)	01-Dec-05	01-Dec-05	[Bar]																							
E09009B.PE.DS.16	Locate Existing Utilities	16-Jan-06	30-Mar-06	[Bar]																							
E09009B.PE.DS.18	HtoKD Design Documentation	01-Dec-05	28-Apr-08	[Bar]																							
Hyak to Crystal Springs (1A)																											
E09009B.PE.EV.18	1A Mitigation Plans	01-Dec-05	24-Dec-08	[Bar]																							
E09009B.PE.EV.19.02.1A	1A Pre-Construction Permits	17-Jan-08	22-Dec-08	[Bar]																							
E09009B.PE.DS.08.02.01	1A Structural Design & Plans	17-Dec-07	08-Dec-08	[Bar]																							
E09009B.PE.DS.10	1A Roadway Materials Documentation	25-Feb-08	19-Aug-08	[Bar]																							
E09009B.PE.DS.15.02	Develop 1A Preliminary Traffic Control Plans	17-Jan-08	21-May-08	[Bar]																							
E09009B.PE.DS.18	1A Design Documentation	06-Aug-08	13-Nov-08	[Bar]																							
E09009B.PE.DS.19.1A	1A Constructability Reviews	25-Sep-08	22-Dec-08	[Bar]																							
E09009B.PE.DS.20	1A Contract Plans Development	23-Oct-08	05-Nov-08	[Bar]																							
E09009B.PE.DS.21.1A	1A Contract Specifications Development	28-Apr-08	09-Jan-09	[Bar]																							
E09009B.PE.DS.22.1A	1A Construction Estimate Development	19-May-08	20-Nov-08	[Bar]																							
E09009B.PE.DS.23	1A Construction Permits	19-May-08	12-Aug-08	[Bar]																							
E09009B.PE.DS.24.1A	1A PS&E Reviews Summary	25-Nov-08	09-Feb-09	[Bar]																							
E09009B.PE.DS.25.1A	1A Contract Ad & Award	12-Aug-08	31-Mar-09	[Bar]																							
Hyak to Snowshed Vicinity (1B)																											
E09009B.PE.EV.18	1B Mitigation Plans	28-May-08	03-Aug-09	[Bar]																							
E09009B.PE.EV.19.02.1B	1B Pre-Construction Permits	27-May-08	19-Mar-09	[Bar]																							
E09009B.PE.DS.07.02	1B Geotechnical Conditions	27-Sep-07	10-Sep-08	[Bar]																							
E09009B.PE.DS.08.02	1B Structural Design & Plans	21-Dec-06	21-Apr-09	[Bar]																							
E09009B.PE.DS.10	1B Roadway Materials Documentation	04-Dec-06	28-Jul-08	[Bar]																							
E09009B.PE.DS.11	1B Preliminary Engineering R/W	04-Aug-08	22-Aug-08	[Bar]																							
E09009B.PE.DS.12	1B Hydraulics	30-Nov-07	04-Aug-08	[Bar]																							



I-90 Snoqualmie Pass East Project		Preliminary Engineering																									
WBS	Activity Description	Start	Finish	2008				2009				2010				2011											
				Q1	Q2	Q3	Q4																				
E09009B.PE.DS.15.02	1B Traffic Design	03-Jun-08	21-Oct-08																								
E09009B.PE.DS.15.05	1B Work Zone Traffic Control (WZTC)	09-Jan-08	14-May-08																								
E09009B.PE.DS.16	Prepare Utility Agreements for 1B	29-Jul-08	05-Mar-09																								
E09009B.PE.DS.18	1B Design Documentation	07-Oct-08	25-Nov-08																								
E09009B.PE.DS.19.1B	1B Constructability Reviews	09-May-08	21-Apr-09																								
E09009B.PE.DS.20	1B Contract Plans Development	01-May-07	04-May-09																								
E09009B.PE.DS.21.1B	1B Contract Specifications Development	09-Oct-08	06-Jul-09																								
E09009B.PE.DS.22.1B	1B Construction Estimate Development	04-Sep-07	06-Jul-09																								
E09009B.PE.DS.23	1B Construction Permits	29-Feb-08	30-Apr-08																								
E09009B.PE.DS.24.1B	1B PS&E Reviews Summary	17-Feb-09	25-Sep-09																								
E09009B.PE.DS.25.1B	1B Contract Ad & Award	21-Jul-09	02-Dec-09																								
Snowshed Vicinity to Keechelus Dam (1C)		01-Dec-05	28-Dec-10																								
E09009B.PE.EV.18	1C Mitigation Plans	31-Dec-08	09-Apr-10																								
E09009B.PE.EV.19.01.03	1C Pre-Construction Permits	02-Feb-09	22-Jul-09																								
E09009B.PE.EV.19.02.1C	1C Pre-Construction Permits	01-May-08	02-Apr-09																								
E09009B.PE.DS.07.02	1C Geotechnical Conditions	28-Mar-07	13-Apr-09																								
E09009B.PE.DS.08.02	1C Structural Design & Plans	22-Oct-07	04-Jun-09																								
E09009B.PE.DS.10	1C Roadway Materials Documentation	01-Dec-05	12-Feb-09																								
E09009B.PE.DS.11	1C Preliminary Engineering RW	19-Apr-05	18-Aug-09																								
E09009B.PE.DS.12	1C Hydraulics	25-Feb-08	25-Nov-08																								
E09009B.PE.DS.15.02	1C Traffic Design	23-Jun-08	02-Sep-08																								
E09009B.PE.DS.15.05	1C Work Zone Traffic Control (WZTC)	02-Mar-09	07-Jul-09																								
E09009B.PE.DS.16	Prepare Utility Agreements for 1C	13-Feb-09	16-Sep-09																								
E09009B.PE.DS.18	1C Design Documentation	17-Feb-09	06-Apr-09																								
E09009B.PE.DS.19.1C	1C Constructability Reviews	01-Dec-05	22-Jan-10																								
E09009B.PE.DS.20	1C Contract Plans Development	29-Jun-09	30-Jul-09																								
E09009B.PE.DS.21.1C	1C Contract Specifications Development	08-May-09	21-May-10																								
E09009B.PE.DS.22.1C	1A Construction Estimate Development	22-Jun-09	06-Aug-09																								
E09009B.PE.DS.24.1C	1C PS&E Reviews Summary	01-Mar-10	20-Oct-10																								
E09009B.PE.DS.25.1C	1C Contract Ad & Award	21-Jul-09	28-Dec-10																								

Appendix B
Earned Value Spreadsheet

Date	Revision	Checked	Approved	Data From Trains and Initial Budgets - Oct 2008 by WorkOp Code										Master Cost Analysis Review				
20-Nov-08	Cost and Budget Data - Addition ...																	
Activity Description	Activity ID	Start Date	Planned Finish	CP	SP	Budgeted Total Cost	AC (Actual) Costs	PV (Planned Value)	ETC (Estimate to Complete)	EAC (Est. Cost @ Comp.)	Roles	Cost Accounts						
Project: I90-Target - 11-2008 2008-DEC - Target budget reported ...		12-01-05 A	09-22-18	1.08	1.05	\$60,516,721.99	\$36,038,252.00	\$36,931,390.13	7,521,973.44	\$66,508,391.47								
WBS: I90-Target - 11-2008.PE PRELIMINARY ENGINEERING		12-01-05 A	09-22-18	1.00	1.04	\$52,566,721.99	\$32,772,283.00	\$31,698,042.30	12,656,235.5	\$58,378,684.41								
WBS: I90-Target - 11-2008.PE.AA BUSINESS MGMT & ADMIN		12-01-05 A	09-22-18	1.04	0.97	\$9,748,897.51	\$6,396,601.29	\$6,858,808.59	11,299,207.86	\$9,758,120.48								
WSDOT - I90 Business Administration 456003 (Management and Administration)	PE.1485	12-01-05 A	09-22-18	0.00	0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00								
WSDOT - I90 Business Administration 456003 (Management and Administration)	PE.1405	11-01-08 A	03-13-15	0.00	0.00	\$300,480.00	\$0.00	\$0.00	\$0.00	\$300,480.00	SC I-90 ...	ENGR						
WSDOT - I90 Project Administration 456001 (Management and Administration)	PE.1005	11-01-08 A	03-22-18	0.00	0.00	\$439,320.32	\$0.00	\$0.00	\$0.00	\$439,320.32	SC I-90 ...	ENGR, ENGR						
WBS: I90-Target - 11-2008.PE.AA.E09009B.PE.AA.1 Project Office Overhead Cost Account		12-01-05 A	02-18-15	1.00	1.00	\$2,381,526.90	\$1,544,801.90	\$1,544,801.90	\$0.00	\$2,381,526.90								
WBS: I90-Target - 11-2008.PE.AA.02 Consultant Administration		12-01-05 A	10-01-08	1.00	1.00	\$391,074.04	\$391,074.04	\$391,074.04	\$0.00	\$391,074.04								
WBS: I90-Target - 11-2008.PE.AA.03 Project Management		12-01-05 A	12-31-09	1.02	0.91	\$2,590,030.73	\$2,123,376.73	\$2,371,943.78	\$466,856.88	\$2,590,616.74								
WBS: I90-Target - 11-2008.PE.AA.01 Project Administration		12-01-05 A	02-20-14	1.07	0.98	\$3,646,455.52	\$2,337,348.62	\$2,550,986.87	\$932,410.94	\$3,655,102.46								
WBS: I90-Target - 11-2008.PE.CM COMMUNICATIONS		12-01-05 A	06-30-11	1.01	1.10	\$3,126,314.47	\$2,145,297.04	\$1,965,813.12	\$778,836.26	\$3,125,099.30								
WBS: I90-Target - 11-2008.PE.EV ENVIRONMENTAL		12-01-05 A	04-15-15	1.03	1.09	\$9,099,243.19	\$5,720,459.43	\$4,390,290.55	\$2,467,871.01	\$11,169,053.14								
WSDOT - I90 Environmental 456005 (Management and Administration)	PE.1480	11-01-08 A	09-13-15	0.00	0.00	\$834,726.00	\$0.00	\$0.00	\$0.00	\$834,726.00	SC I-90 ...	ENGR, ENGR						
WBS: I90-Target - 11-2008.PE.EV.17 Environmental Documentation		12-01-05 A	09-31-11	1.12	1.29	\$4,991,755.24	\$3,666,445.91	\$3,178,570.68	\$924,713.57	\$5,424,823.48								
WBS: I90-Target - 11-2008.PE.EV.01a Environmental Overhead Account		12-01-05 A	04-15-15	0.72	0.59	\$1,789,579.99	\$999,775.46	\$1,228,471.37	\$720,038.00	\$2,286,473.46								
WBS: I90-Target - 11-2008.PE.EV.18 Mitigation Plans		10-01-06 A	09-25-11	0.99	1.08	\$1,344,883.76	\$860,277.84	\$784,660.29	\$822,819.50	\$1,688,350.98								
WBS: I90-Target - 11-2008.PE.EV.18.01 Recreation Mitigation Plan		10-24-06 A	02-25-08	1.00	1.00	\$66,266.00	\$66,265.90	\$66,266.00	\$0.00	\$66,265.90								
WBS: I90-Target - 11-2008.PE.EV.18.02 Wetlands & Aquatic Resource Mitigation Plans		01-02-08 A	03-24-10	2.04	1.51	\$256,159.00	\$125,507.39	\$169,349.56	\$130,651.61	\$256,159.00								
WBS: I90-Target - 11-2008.PE.EV.18.03 Wildlife Monitoring		11-29-06 A	03-25-11	0.75	0.94	\$840,039.85	\$488,480.49	\$386,074.64	\$381,167.89	\$869,648.38								
WBS: I90-Target - 11-2008.PE.EV.18.04 Snowshed Removal Mitigation		02-04-08 A	04-21-09	0.73	1.00	\$43,005.23	\$35,540.60	\$25,773.17	\$311,000.00	\$346,540.60								
WBS: I90-Target - 11-2008.PE.EV.18.05 Landscape Design		10-01-06 A	10-22-09	0.96	1.00	\$136,413.68	\$144,483.46	\$137,196.03	\$0.00	\$140,737.10								
WBS: I90-Target - 11-2008.PE.EV.19 Environmental Permits		09-01-06 A	10-19-11	1.00	1.00	\$928,598.21	\$201,969.22	\$201,888.21	\$0.00	\$928,679.22								
WSDOT Environmental Permits Summary WSDOT (LOE) Labor	PE.1050	11-01-08 A	10-19-11	0.00	0.00	\$726,710.00	\$0.00	\$0.00	\$0.00	\$726,710.00	SC I-90 ...	ENGR, EN...						
WBS: I90-Target - 11-2008.PE.EV.19.01 Pre-Construction Permits		12-10-06 A	07-23-09	0.00	0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00								
WBS: I90-Target - 11-2008.PE.EV.19.02 Construction Permits		09-01-06 A	03-24-10	1.00	1.00	\$201,888.21	\$201,969.22	\$201,888.21	\$0.00	\$201,969.22								
WBS: I90-Target - 11-2008.PE.DS ENGINEERING		12-01-05 A	03-18-15	0.98	1.04	\$27,518,990.37	\$18,501,916.24	\$17,479,832.04	\$8,012,560.22	\$32,048,525.06								
WSDOT - I90 Engineering 456002 (Management and Administration)	12.1005	11-03-08 A	09-13-15	0.00	0.00	\$500,375.68	\$0.00	\$0.00	\$0.00	\$500,375.68	SC I-90 ...	ENGR						
WBS: I90-Target - 11-2008.PE.DS.00 Engineering Overhead Cost Account		12-01-05 A	09-17-10	1.15	1.32	\$3,589,799.21	\$2,999,510.23	\$2,603,026.32	\$489,376.25	\$4,078,567.23								
WBS: I90-Target - 11-2008.PE.DS.01 Project Documentation		12-01-05 A	09-27-09	1.55	0.82	\$32,693.88	\$16,165.86	\$30,553.25	\$0.00	\$16,165.86								
WBS: I90-Target - 11-2008.PE.DS.02 Cost Risk Estimate & Management		05-01-06 A	12-31-08	2.47	1.14	\$867,095.37	\$347,858.65	\$763,457.33	\$81,560.70	\$420,410.35								
WBS: I90-Target - 11-2008.PE.DS.1 Unapproved Planned Expenses		11-03-08 A	06-30-10	0.00	0.00	\$3,791,240.00	\$0.00	\$0.00	\$3,782,740.00	\$3,791,240.00								
WBS: I90-Target - 11-2008.PE.DS.03 Project Data		04-01-06 A	09-18-13	1.00	1.00	\$809,820.38	\$786,706.57	\$786,754.11	\$0.00	\$846,161.49								
WBS: I90-Target - 11-2008.PE.DS.05 Value Engineering		08-18-06 A	07-28-08	1.28	1.00	\$65,300.23	\$51,106.51	\$65,300.23	\$14,193.48	\$65,299.99								
WBS: I90-Target - 11-2008.PE.DS.06 Roadway Materials Documentation		03-01-06 A	03-24-09	1.00	1.00	\$71,328.85	\$68,787.89	\$68,448.85	\$0.00	\$71,667.89								
WBS: I90-Target - 11-2008.PE.DS.07 Geotechnical Program		04-01-06 A	10-06-11	0.73	0.96	\$7,220,699.59	\$8,432,488.41	\$6,470,076.09	\$539,141.53	\$9,562,854.28								
WBS: I90-Target - 11-2008.PE.DS.08 Bridge & Wall Structures		05-01-06 A	07-26-11	0.95	0.95	\$1,539,821.68	\$1,461,664.95	\$1,452,841.08	\$26,608.83	\$1,923,084.36								
WBS: I90-Target - 11-2008.PE.DS.09 Wildlife Exclusionary Fence Design/Plans		07-02-07 A	10-25-10	0.85	0.83	\$377,119.00	\$176,865.84	\$181,467.59	\$200,253.16	\$377,119.00								
WBS: I90-Target - 11-2008.PE.DS.10 Roadway Design		01-01-06 A	05-21-14	1.35	1.00	\$1,328,662.85	\$659,136.33	\$890,874.73	\$0.00	\$1,328,731.33								
WBS: I90-Target - 11-2008.PE.DS.11 Preliminary Engineering Right of Way		09-01-06 A	11-24-09	1.02	1.00	\$361,834.90	\$350,991.91	\$357,983.16	\$0.00	\$371,851.71								
WBS: I90-Target - 11-2008.PE.DS.12 Hydraulics		10-26-06 A	09-23-11	1.35	1.05	\$5,628,843.35	\$2,476,700.18	\$3,200,548.63	\$2,803,366.17	\$5,590,386.35								
WBS: I90-Target - 11-2008.PE.DS.15 Traffic		07-03-06 A	05-21-14	1.37	0.98	\$554,444.35	\$193,765.67	\$270,869.61	\$15,505.97	\$1,240,741.73								
WBS: I90-Target - 11-2008.PE.DS.16 Utilities		05-01-06 A	01-22-13	2.25	1.00	\$73,079.24	\$13,265.10	\$29,818.03	\$59,814.14	\$73,079.24								
WBS: I90-Target - 11-2008.PE.DS.18 Design Documentation		10-01-06 A	05-21-14	0.38	1.00	\$113,379.08	\$84,115.65	\$31,807.14	\$0.00	\$584,516.40								
WBS: I90-Target - 11-2008.PE.DS.19 Constructability Reviews		11-01-07 A	06-05-14	1.47	1.01	\$54,101.30	\$13,029.75	\$18,885.85	\$0.00	\$54,760.05								
WBS: I90-Target - 11-2008.PE.DS.20 Contract Plans Development		09-01-06 A	07-18-14	1.12	1.00	\$259,036.95	\$182,986.95	\$204,470.19	\$0.00	\$236,892.15								
WBS: I90-Target - 11-2008.PE.DS.21 Contract Specifications Development		05-01-08 A	01-12-15	0.00	1.00	\$195,615.40	\$0.00	\$11,072.56	\$0.00	\$195,615.40								
WBS: I90-Target - 11-2008.PE.DS.22 Construction Estimate Development		02-01-06 A	05-21-14	0.20	2.78	\$34,260.87	\$139,578.00	\$10,242.63	\$0.00	\$653,658.75								
WBS: I90-Target - 11-2008.PE.DS.23 Construction Permits		12-15-06 A	07-19-14	1.00	1.00	\$40,291.19	\$40,291.19	\$40,291.19	\$0.00	\$40,291.19								
WBS: I90-Target - 11-2008.PE.DS.24 PS&E Reviews		03-06-08 A	01-12-15	0.00	1.15	\$3,192.36	\$0.00	\$250.53	\$0.00	\$3,192.36								
WBS: I90-Target - 11-2008.PE.DS.25 Contract Ad & Award		07-01-07 A	03-18-15	0.17	1.16	\$5,954.67	\$6,898.60	\$992.96	\$0.00	\$12,853.27								
WBS: I90-Target - 11-2008.PE.DEF_ID_1E_1F PRELIMINARY ENGINEERING		02-06-12	10-30-15	0.00	0.00	\$2,283,886.45	\$0.00	\$0.00	\$0.00	\$2,283,886.45								
1E - SVO&D Exclusionary Fence & Roadside Restoration PE Summary	1F.1010	05-02-12*	10-25-13	0.00	0.00	\$1,289,267.00	\$0.00	\$0.00	\$0.00	\$1,289,267.00	SC I-90 ...	ENGR						
1F - Hts&V Exclusionary Fence & Roadside Restoration PE Summary	1E.1010	04-13-15*	10-30-15	0.00	0.00	\$807,999.00	\$0.00	\$0.00	\$0.00	\$807,999.00	SC I-90 ...	ENGR						
1D - Hyak Maintenance Facility and SW Retrofit PE Summary	1D.1010	02-06-12*	07-31-13	0.00	0.00	\$186,620.45	\$0.00	\$0.00	\$0.00	\$186,620.45	SC I-90 ...	ENGR						
WBS: I90-Target - 11-2008.RW RIGHT OF WAY ACQUISITION		01-01-08 A	10-27-09	1.82	1.14	\$7,950,000.00	\$3,265,969.00	\$5,233,347.83	\$4,863,738.04	\$8,129,707.06								

Appendix C
PS&E Task Checklists

30% Task Checklist

PS&E Sheets
Prepare Alignment/R/W Plans
Prepare Paving Plans
Prepare Roadway Sections
Prepare Profile Sheets
Prepare PS&E Vicinity map

60% Task Checklist

PS&E Sheets	Phase
Prepare Preliminary Gold Creek Area Plan	1B
Prepare Preliminary Animal Crossing Plan	1B
Prepare Preliminary Rock Run Area Plan	1B
Prepare Preliminary Resort Creek Area Plan	1C
Prepare Preliminary Snowshed Structure Plan	1C
Prepare Preliminary Slide Curve Bridge and Walls Design/Plans	1C
Prepare Preliminary Slide Curve and Resort Creek MSE Retaining Wall Design/Plan	1C
Prepare Preliminary TESC Design/Plan	1B and 1C
Prepare Preliminary Illumination Plans	1B and 1C
Prepare Preliminary Signing Plans	1B and 1C
Prepare Preliminary ITS Plan	1B and 1C
Prepare Roadside LA Package	1E and 1F
Prepare Slide Curve Snow Fence Design	1C
Prepare Preliminary Traffic Control Plans	1B and 1C
Prepare Proposed Preliminary Drainage Plans	1B and 1C
Prepare Preliminary Staging Plans	1B and 1C
Prepare Salvage Plans	1B and 1C

90% Task Checklist

PS&E Sheets	Phase
Produce Final ITS Design/Plan	1B and 1C
Prepare Summary of Quantities	1B and 1C
Develop Preliminary Contract Specifications	1B and 1C
Prepare Construction Schedule	1B and 1C
Prepare Quantity Tabulation sheets	1B and 1C
Prepare Final Staging Plans	1B and 1C
Prepare Final ITS Design/Plans	1B and 1C
Prepare Preliminary Sign structure Plans (for ITS)	1B and 1C
Prepare Rock Slope Stabilization Plans	1B and 1C
Develop Final Roadside Landscape Plans	1B and 1C

Final PS&E Task Checklist

PS&E Sheets	Phase
Finalize Slide Curve Bridge and Wall Design/Plan	1C
Produce Final Plans for Bridge Structures at Go Id Creek	1B
Produce Final Plans for Bridge Structures at Rocky Run Creek	1B
Produce Final Plans for Bridge Structures at Resort Creek	1C
Produce Final Snowshed Structure Plans	1C
Assemble Index for PS&E Review	1B and 1C
Prepare Final TESC and Temporary Design/Plans	1B and 1C
Prepare Final Drainage Design/Plans	1B and 1C
Prepare Final Temporary Drainage Structure Notes	1B and 1C
Prepare Final Engineer's Cost Estimate and Schedule	1B and 1C
Prepare Final Proposed Drainage Structure Notes	1B and 1C
Assemble Final Sign Structure Plans (ITS)	1B and 1C

Appendix D

I-90 Snoqualmie Pass East Project Change Management Form

I-90 Snoqualmie Pass East Project Change Management Form

Submitted By:		Date Submitted	
	Title:		
Reviewed By:		Date Reviewed	
	I-90 Project Business Manager		
Approved By:		Date Approved	
	I-90 Project Director		
Date Entered in I-90 Change Control Log by Business Manager			

Description of Change

Baseline Condition:
Variance:
Variance Type:
Variance Cause:

Quantification of Impacts

Impact to Budget (include cost of schedule impact):
Impact to Schedule:
Impact to Technical Approach:

Disposition / Mitigation

Proposed Disposition:
Mitigation Measures:
Lessons Learned to be Implemented: