Columbia River CROSSING

Road Map Item #: 5.11

Product Name: **RISK AND CONTINGENCY MANAGEMENT PLAN (RCMP)**

PMP Appendix: APPENDIX C

Submittal Date: May 1, 2013

ABSTRACT: This deliverable describes how the team will deal with uncertainty and risks that affect project objectives, most notably cost and schedule. Project risk management is an ongoing part of project management and is done throughout the life of the project. The CRC project management team has cultivated and continues to nurture a risk aware culture. This plan is calibrated to the Project Management Plan required for the Full Funding Grant Agreement (FFGA) stage of project development. The project team continuously monitors risks and uses this plan continuously throughout the completion of design, contracting and construction, and successful commencement of revenue service.

RISK AND CONTINGENCY MANAGEMENT PLAN

Draft Report

May 2013

Columbia River CROSSING

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DOCUMENT REVISION RECORD

Columbia River Crossing – Project Management Plan

REVISIONS

As the Columbia River Project progresses and additional details and information emerge this Risk and Contingency Management Plan will be reviewed and updated to reflect relevant changes.

APPROVAL PAGE

Columbia River Crossing - Project Management Plan May 2013 Rev 05

Approved by:

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ACRONYMS

CEVP	Cost Estimate Validation Process
CRC	Columbia River Crossing
ERMO	Enterprise Risk Management Office
FFGA	Full Funding Grant Agreement
FTA	Federal Transit Authority
ODOT	Oregon Department of Transportation
PMOC	Project Management Oversight Contractor
PMP	Project Management Plan
RA	Risk Assessment
RCMP	Risk and Contingency Management Plan
ROD	Record Of Decision *or* Revenue Operations Date
WSDOT	Washington State Department of Transportation

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1. Overview

[1]This document is the Project Risk and Contingency Management Plan (RCMP) for the Columbia River Crossing (CRC) program. This plan describes how the team will deal with uncertainty and risks that affect project objectives, most notably cost and schedule. Project risk management is an ongoing part of project management and is done throughout the life of the project. The CRC project management team has cultivated and continues to nurture a risk aware culture. This plan is calibrated to the Project Management Plan required for the Full Funding Grant Agreement (FFGA) stage of project development. The project team continuously monitors risks and uses this plan continuously through the completion of design, contracting and construction.

The Risk and Contingency Management Plan is a sub-plan of the Project Management Plan (PMP) for CRC. The purpose of the RCMP is to highlight specific areas of management focus as identified through the Cost Estimation Validation Process (CEVP), and Federal Transit Authority (FTA) risk review process.

This RCMP is a living document that is updated as necessary during project development and delivery.

1.1 Topics in this RCMP

1. Overview. This chapter provides a summary of the RCMP and how it fits into the overall project management plan for the Columbia River Crossing, CRC project.

2. Goals and Objectives. This chapter describes the major goals and objectives for risk and contingency management for CRC.

3. Risk Review Process. This chapter describes the procedures used for development of the Risk and Contingency Management Plan (RCMP) risk identification, risk assessment, risk response, risk protection measures (such as Secondary Mitigation and minimum contingencies) and risk management and control.

4. Insurance. This chapter summarizes use of insurance at CRC and where to find the detailed information.

5. Primary Mitigation. This chapter describes primary risk response actions to mitigate the impact of identified key risks.

6. Contingency Management. This chapter describes cost and schedule contingency protections including contingency recommendations and management of cost

[1] This Project Risk and Contingency Management Plan follows the rigorous standards and policies set forth by WSDOT as expressed in their directional documents, and their Project Risk Management Guide, and their Workshop Guidelines posted at: http://www.wsdot.wa.gov/Projects/ProjectMgmt/RiskAssessment/ . This RCMP is also consistent with the guidance provided by FTA Oversight Procedure 40 – Risk and Contingency Review and follows the RCMP structure provided in Appendix G.

contingency and schedule contingency. This includes procedures for authorization, transfer, and use of contingency.

7. Secondary Mitigation. This chapter describes the use of secondary mitigation and a list of items and timing necessary for implementation of secondary mitigation actions.

8. Risk Management and Risk Mitigation – this chapter describes the plans for administering and maintaining this RCMP, including:

    - Identification and Analysis of project risk;
    - Risk response options (primary and secondary);
    - Risk monitoring and control;
    - Documenting and reporting to the Federal Transit Administration (FTA);
    - Design control processes;
    - Plans for updating the risk register;
    - Plans and timing for updating the RCMP.

1.2 Risk Assessment Activities and Key Project Milestones

The WSDOT Cost Estimation Validation Process (CEVP) and FTA Risk Assessment (RA) are workshops held to help identify and manage risks.

Table 1-1 below lists some key milestones for the CRC project; the schedule management contingency section of this document provides dates.

Table 1-1. CRC Risk Management Activities and Associated Project Activities

CEVP workshop	October 9-12, 2006
Risk Assessment Workshop	July 23-27, 2007
CEVP workshop	February 2-6, 2009
Risk Review Update (LPA Options)	August 29-30, 2009
CEVP workshop	November 1-2, 2010
CEVP workshop	May 2-6, 2011
Record Of Decision Signed	December 7, 2011
CEVP workshop risk register review	April 23-27, 2012
Risk Based Estimating Exercise	October 12 – November 16, 2012
Full Funding Grant Agreement Award (FFGA)	
Ad Date for first contract package	

Key risks identified for CRC quantify both cost and schedule. These risks are identified, defined, quantified, and analyzed to effectively use resources in response to risks. This document provides the plan for sound risk management and will be augmented with supplemental information as the project develops.

1.3 Updates to the RCMP

This RCMP will be regularly reviewed by the Federal Transit Administration (FTA) Project Management Oversight Contractor (PMOC), the Federal Highway Administration and WSDOT (as the grantee). Updates will be made as necessary.

This Plan incorporates recommendations from FTA PMOC Document reviews and formal and informal review comments by the project team.

Ongoing project risk management for CRC will be provided in monthly Risk Management meetings incorporating recent risk assessment information.

Risk management is an ongoing process through design, construction and project opening. It is not possible to eliminate all risk, however through our project risk management process and risk workshops, we blend intuition and reason to produce more informed decisions. Including the appropriate subject matter experts and project team at the workshops allows for vital communication, a broader perspective, and fills in the knowledge gaps by identifying and reducing risks.

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2. Goals and Objectives

2.1 Goals

As the CRC program progresses and moves into final design and construction, the goals of this RCMP are to:

1. Ensure that CRC risks are managed pro-actively, within the control of the program.
2. CRC is committed to complete the project within budget and on schedule.
3. Maintain and manage appropriate cost and schedule contingency through project delivery.
4. Ensure that risks outside the direct control of the CRC Program are effectively dealt with through collaboration with the CRC partners and internal and external stakeholders to minimize the impacts of these events on delivery of the program within budget and schedule.

2.2 Objectives

The main objective is to respond to identified threat risks and make the most of opportunities. The CRC Program will manage risks for each of its projects and provide updates throughout program delivery. RCMP objectives, include:

- Identify and define key risk events (program level and project level)
- Ensure that risks affect more than one project are correctly identified and managed
- Avoid double-counting of risk events
- Report on the Status of key risks (monitor and control capabilities)
    - Response actions taken
    - Cost of response actions
    - Results of response actions
    - Does risk remain active or can it be retired?
    - Summary of risk management efforts and outcomes

The Risk and Contingency Management Plan for the CRC program is consistent with:

Federal Transit Administration (FTA), Oversight Procedure 40 (OP 40)
Federal Highway Administration (FHWA)
Oregon Department of Transportation (ODOT)
Washington State Department Of Transportation (WSDOT)
Project Risk Management, Guidance for WSDOT Projects, July 2010
Guidelines for Cost Risk Assessment-Cost Estimate Validation Process Workshops, March 2010
Instructional Letter IL 4071 Risk-Based Project Estimates for Inflation Rates, Market Conditions, and Percentile Selection, February 23, 2012

3. Risk Review Process

CRC risk management emphasizes "solution-based" thinking by developing response actions. A key tool is frequent and timely communication on how the project risks are trending and how they may affect neighboring projects.

Communicating risk management strategies will be included in already regular meetings. Table 3-1 offers a standard meeting plan. These meetings can be stand-alone or can be agenda items.

Table 3-1. Meeting Plan for Effective Risk Management Communications

Meeting	Meets	Length	Attendees
Project interface task force	2 weeks	1 hour	CRC risk manager and project managers
Risk update (with each specialty group or project)	Monthly	1 hour	CRC risk manager and project managers (one-on one)
Risk management validation **Interface risk management**	Quarterly	1 day	CRC risk manager and project managers
[1]Risk review check-in	Frequently	Varies	As per usual

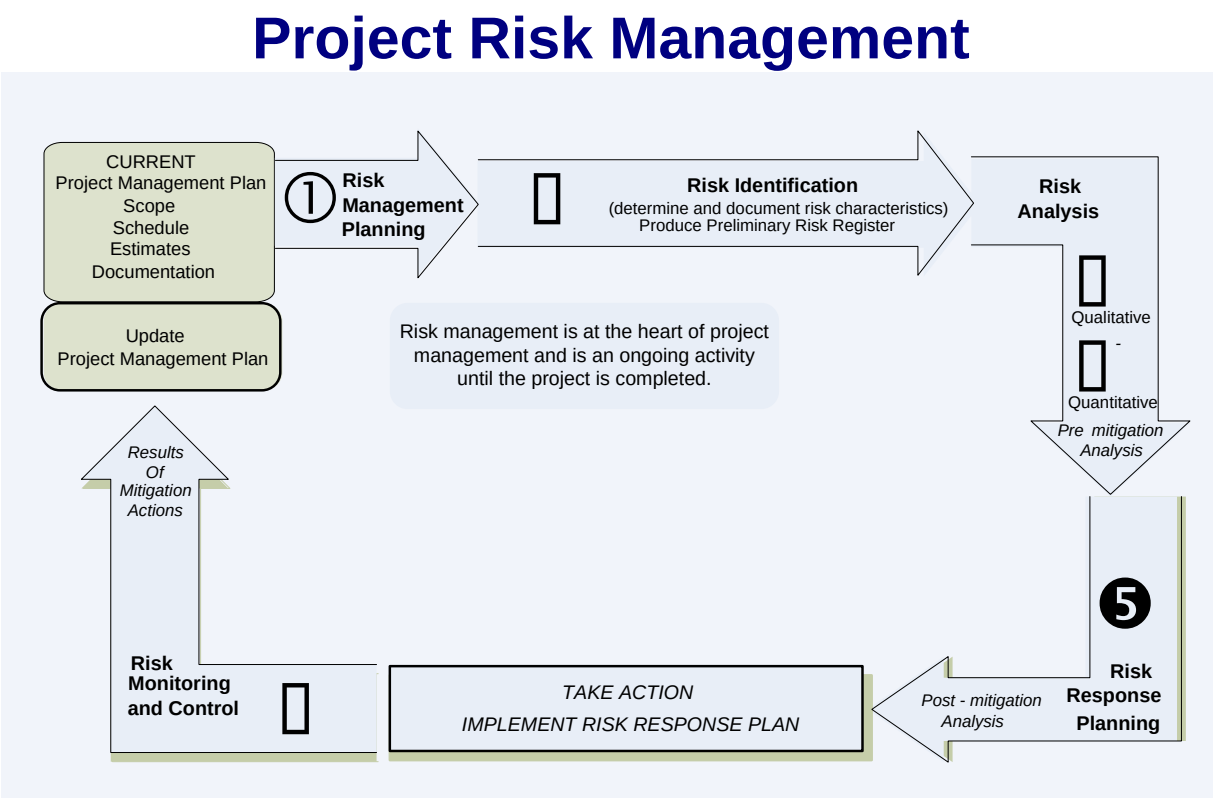
[1]At various project meetings, control meetings et al; the topic of risk should be on the agenda. These meetings serve as check-in to communicate with project staff how risk management is going and inform them of the status and progress on risk management.

This risk management effort consistent with the guidance provided in the USDOT Federal Transit Administration "Oversight Procedure 40 – Risk and Contingency Review" and the "Project Risk Management, Guidance for WSDOT Projects" posted at:
http://www.wsdot.wa.gov/publications/fulltext/cevp/ProjectRiskManagement.pdf

In addition, risk management workshops follow the rigorous guidelines established by WSDOT for its Cost Estimate Validation Process (CEVP) workshops as expressed in WSDOT Guidelines for CRA-CEVP Workshops 2010-March and posted at:
http://www.wsdot.wa.gov/publications/fulltext/cevp/WorkshopGuidelines.pdf

WSDOT uses a sophisticated risk management system, an Access database, to manage risks and have current information on project risks at all times for the project team. This tool has also been utilized at other major projects within WSDOT, such as the Alaskan Way Viaduct and the SR 520 Floating Bridge.

Figure 3-1. Project Risk Management Flowchart (general)



3.1 Risk Management Planning

① Risk Management Planning

The Level of Risk Assessment for the Columbia River Crossing program and its component projects is met or exceeded as determined through E 1053.00, Executive Order for "Project Risk Management and Risk Based Estimating".

3.2 Risk Identification

② Risk Identification

Focus on significant critical risks that affect project objectives; this may be accomplished by establishing minimum thresholds for risk events (minimum dollar and time durations that warrant formal listing and consideration). Identified risks are described and recorded in a risk register beginning early in project development. The risk register is reviewed and updated regularly; see Appendices for a copy of the active Risk Register. The risk register is maintained and kept in a state of readiness for workshops and to respond to inquiries about status of program and project risks.

Identified risks will be described in detail and include:

Identification number for each risk; (see Appendices of this document) a unique number will be assigned to each risk for tracking purposes. Unique identifier numbers will be assigned to each risk utilizing the standard FTA Risk Categories and Standard Cost Categories, SCC and WSDOT Risk Breakdown Structure (RBS). This provides a consistent and convenient way to track risks at an appropriate level of detail; and allows for the development of a risk database by category.

Date when the risk and the activity the risk affects were identified;

Name of the identified risk event; a descriptive title or name for each risk will be recorded.

Detailed description of the risk; each identified risk will be described with information that is **S**pecific, **M**easurable, **A**ttributable, **R**elevant and **T**ime bound (SMART). The description will be clear enough and thorough enough so that others reading it will be able to understand the risk.

Risk Trigger; each identified risk must include the risk trigger(s). Risks rarely just suddenly occur; usually there is some warning of imminent threat or opportunity. These warning signs should be clearly described and information about the risk trigger should be documented.

Risk Type; document whether the risk affects project schedule, cost or both.

Potential Responses to Identified Risks; document, if known, possible response actions to the identified risk –can a threat be avoided, reduce, transferred, mitigated or accepted? - can an opportunity be exploited, shared, enhanced or accepted?

FTA Risk Categories; Risks are characterized as belonging to any of the following categories; Requirement, Market, Design, and Construction (See Definitions). For detailed descriptions of FTA risk categories, visit *FTA Oversight Procedures 40 – Risk and Contingency Review Section 6.3*. Below are the FTA risk categories (Requirements, Design, Market, and Construction) with examples as of November 13, 2012:

Design Risks (56 active design risks); Currently there are extensive partnering and outreach efforts to reduce risks associated with design changes. The top key design risks are provided below:

SCC Code	Risk Title
40.05	Added aesthetics costs

RC.RC.STG.10.02	There is an increase to the aesthetic costs/context sensitive solutions for Columbia River Bridge, both structural and non-structural caused by stakeholder input.

Actively manage work of architect involved in RFP development to ensure that RFP aesthetic requirements are detailed, reasonable and cost-effective. Putting an explicit limit into the RFP may reduce the likelihood of this risk occuring. 10-17-2012 F. Green The aesthetic improvements could also be structural in nature.

7/18/2012 Frank Green to monitor - mitigate/active manage architect work to insure requirements are met and are reasonable and cost effective.

Current project risk ranking: 8	Current program risk ranking: 8

10.04 & 40.05	Design may not be able to mitigate parking loss or access to covered parking for building adjacent to southernmost platform in Vancouver.

RC.RC.STG.10.06	River Crossing structure type changes through Alternative Technical Concept process

Current leadership guidance sets the structure type at deck truss. Design-Builder may come up with a bridge type that could save money on the river crossing.

Reviewed 10-17-2012 no change.

Current project risk ranking: 9	Current program risk ranking: 9

Market Risks (8 active market risks); Long lead items have been identified to expedite the procurement process and phasing is being analyzed to allow for the implementation of large, small and specialized construction packages. In addition the specifically identified risk events the model analysis also captures the fact that things can go better than planned when bids are submitted (reflecting a favorable/highly competitive bidding environment) or things can go worse than planned when bids are submitted (reflecting a less favorable/less competitive bidding environment).

SCC Code	Risk Title
10.10.01	Uncertain market conditions for track: Steel material price fluctuations
10.12.01	Uncertain market conditions for track: Special switches and turnouts
10.12.02	Track: Special switches and turnouts exceed escalation

Construction Risk; The project has a high level of construction complexity. Depending on the contracting option selected many of these risks may be transferred to the contractor. However, the project will still monitor these risks to ensure that the contractor is mitigating them appropriately. A majority of these risks originate from the tight working conditions within the corridor and downtown Vancouver as well as Hayden Island and the necessary sequencing of activities to complete the CRC project within the tight project and budget constraints.

SCC Code	Risk Title
40.02.08	City of Vancouver requires undergrounding of utilities
	Drilled shafts need to be deeper than 150'/130' in the vicinity of Marine Dr. and Hayden Island due to differing geotechnical conditions
60.02.05	Condemnation is necessary

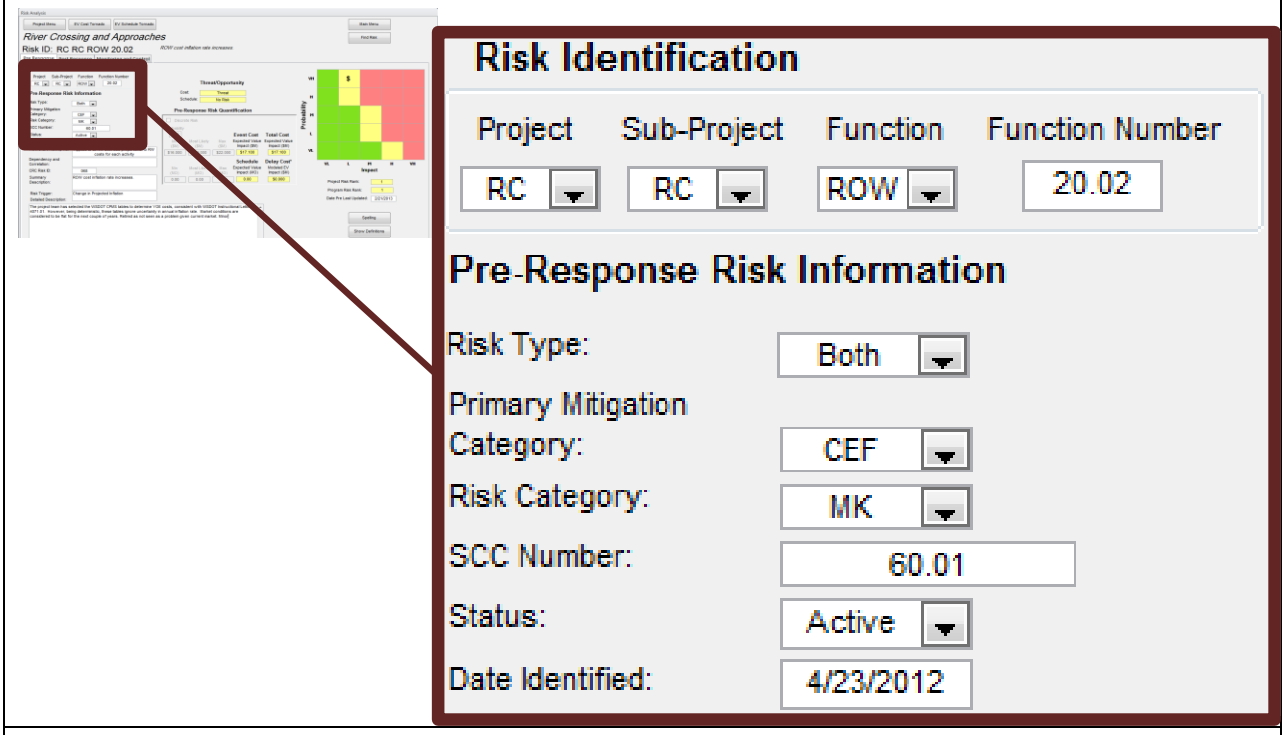
Contract Packaging Risk Identification; Delivery methods and contracting risks are largely tied to issues surrounding contracting strategy and the management and oversight of contractors.

A unique Risk Identification Numbering system is used to identify CRC project risks. The identification of risks employs an agile system with standard risk breakdown structures for highway construction by used by WSDOT and also FTA risk categories and SCC codes. Figure 3-2 depicts how each risk has a unique identifier Figures 3-3 and 3-4 illustrate the definitions of these coding systems. Figure 3-5 provides a flowchart for risk identification. Risk identification can take place anytime; this can occur at formal workshops or anytime in between. Table 3-1 lists the Standard Cost Code (SCC) categories defined by FTA and used in the risk identification system for the CRC project.

Table 3-2. SCC Categories 10-100

SCC
10 Guideway and Track Elements
20 Stations, Stops, Terminals, Intermodal
30 Support Facilities: Yards, Shops, Admin. Bldgs
40 Sitework and Special Conditions
50 Systems
60 Row, Land, Existing Improvements
70 Vehicles
80 Professional Services
90 Unallocated Contingency
100 Finance Charges

Figure 3-2. Risk Identification Numbering System (EXAMPLE)



Project – identifies the specific project the risk may affect
Sub-Project – identifies the specific sub-project the risk may affect
Function – WSDOT Risk Breakdown Structure (RBS) code
Function Number – unique numerical identifier
Risk Type – Transit, Highway or Both
Primary Mitigation Category – categorization defined by FTA OP 40 Appendix G
Risk Category – FTA risk categories (market, requirements, design, construction)
SCC Number –Standard Cost Category (FTA defined system)
Status – risk is active or retired (issues are also identified)
Date – when the risk was identified

3.2.1 FTA Risk Category Descriptions

Requirements Risk (RQ)

Risks that relate to the establishment and variability of fundamental goals and conditions of a project to which the design must respond; also the activities of the Grantee to actively identify these goals and conditions. Generally, a requirements risk is associated with all project development activities from earliest concept through Alternatives Analysis. A significant portion of Requirements Risk can be attributed to the potential influence of project stakeholders if project goals and requirements are not fully defined.

Design Risk (DS)

Risks associated with the performance and variability of design related activities occurring after Alternatives Analysis. Substantially complete design risk is indicated when no material design-related non-conformances are detected through the scope review; the estimate review indicates that 95% of all construction direct cost activities are shown on both design deliverables and cost estimate; and the schedule review indicates that no project level critical path element or procurement activity exceeds 45 calendar days.

Market Risk (MK)

Risks related to the procurement of construction services, materials, equipment and the variability associated therewith. This risk refers to both the effects of the open-market pricing of goods and services, as well as the effects of the Grantee's contract packaging strategies.

Construction Risk (CN)

Risks that consider the inevitable variability of the project's environment –including such items as unusual weather, unexpected subsurface conditions, and unexpected contractor failure –as well as performance risk that is manageable by the Grantee and its consultants and contractors – for example uncertainty surrounding the mobilization of a tunnel boring machine and its planned production rates. Construction risk is subdivided into: Early Construction Risk (composed of Geotechnical/Utilities activities, usually associated with 20% complete), Mid-range Construction Risk (associated with coordination of contractors, etc.), and Start-Up/Substantial Completion Risk (associated with 90% complete).

3.2.2 FTA Primary Mitigation Risk Categories (see Chapter 5)

Primary Mitigation:

- Technical Capacity
- Project Scoping and Design;
- Delivery Methods and Contracting;
- Construction Process;
- Project Tracking, including:
    - Cost Estimating, Financing and Financial Management; and
    - Project Schedule Management.

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Figure 3-3. FTA Standard Cost Categories (SCC)

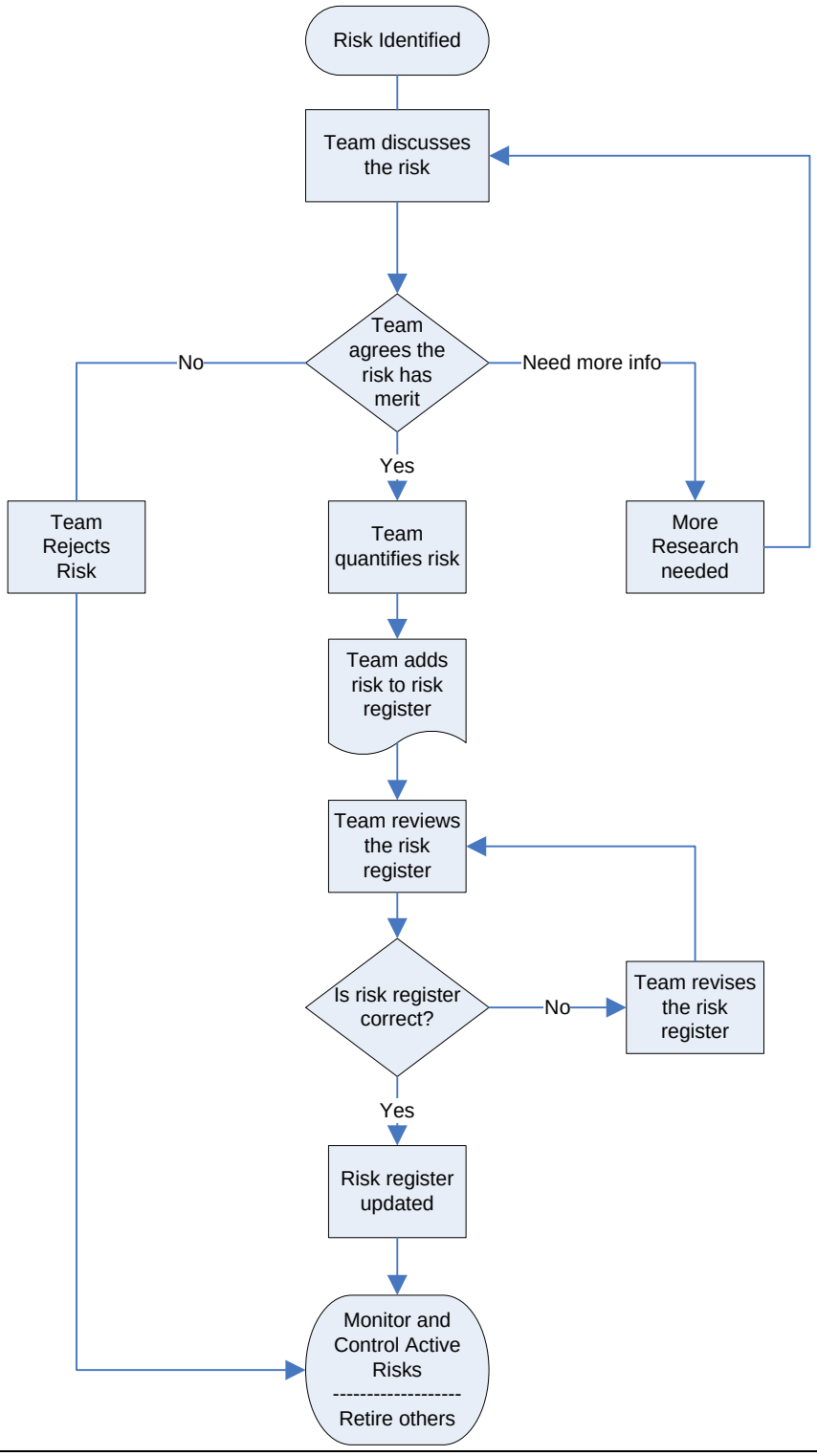
FEDERAL TRANSIT AUTHORITY (FTA) Project Risk Categories and Standard Cost Categories (SCC)

FTA STANDARD COST CATEGORIES >	10 GUIDEWAY & TRACK ELEMENTS (route miles)	20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	40 SITEWORK & SPECIAL CONDITIONS	50 SYSTEMS	60 ROW, LAND, EXISTING IMPROVEMENTS	70 VEHICLES (number)	80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	90 UNALLOCATED CONTINGENCY	100 FINANCE CHARGES
	10.01 Guideway: At-grade exclusive right-of-way	20.01 At-grade station, stop, shelter, mall, terminal, platform	30.01 Administration building: office, sales, storage, revenue counting	40.01 Demolition, Clearing, Earthwork	50.01 Train control and signals	60.01 Purchase or lease of real estate	70.01 Light Rail	80.01 Preliminary Engineering		
	10.02 Guideway: At-grade semi-exclusive (allows cross traffic)	20.02 Aerial station, stop, shelter, mall, terminal, platform	30.02 Light Maintenance Facility	40.02 Site Utilities, Utility Relocation	50.02 Traffic signals and crossing protection	60.02 Relocation of existing households and businesses	70.02 Heavy Rail	80.02 Final Design		
	10.03 Guideway: At-grade in mixed traffic	20.03 Underground station, stop, shelter, mall, terminal, platform	30.03 Heavy Maintenance Facility	40.03 Hazardous materials, contaminated soil removal/mitigation, ground water treatments	50.03 Traction power supply: substations		70.03 Commuter Rail	80.03 Project Management for Design and Construction		
	10.04 Guideway: Aerial structure	20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	30.04 Storage or Maintenance of Way Building	40.04 Environmental mitigation, e.g. wetlands, historic/archaeological, parks	50.04 Traction power distribution: catenary and third rail		70.04 Bus	80.04 Construction Administration and Management		
	10.05 Guideway: Built-up fill	20.05 Joint development	30.05 Yard and Yard Track	40.05 Site structures inlcuding retaining walls, sound walls	50.05 Communications		70.05 Other	80.05 Professional Liability and other Non-Construction Insurance		
	10.06 Guideway: Underground cut and cover	20.06 Automobile parking multi-story structure		40.06 Pedestrian/bike access and accommodation, landscaping	50.06 Fare collection system and equipment		70.06 Non-revenue vehicles	80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		
	10.07 Guideway: Underground tunnel	20.07 Elevators, escalators		40.07 Automobile, bus, van accessways including roads, parking lots	50.07 Central Control		70.07 Spare parts	80.07 Surveys, Testing, Investigation, Inspection		
	10.08 Guideway: Retained cut or fill			40.08 Temporary facilities and other indirect costs during construction				80.08 Start up		
	10.09 Track: Direct fixation									
	10.10 Track: Embedded									
----------	10.11 Track: Ballasted									
	10.12 Track: Special (switches and turnouts)									
	10.13 Track: Vibration and noice dampening									

Figure 3-4. WSDOT Risk Breakdown Structure (RBS)

Level 1	Project Risk									
Level 2	**Environmental & Hydraulics** ENV	**Structures & Geotech** STG	**Design / PS&E** DES	**Right-of-Way** (including Access and Acquisition) ROW	**Utilities** UTL	**Railroad** RR	**Partnerships and Stakeholders** PSP	**Management / Funding** MGT	**Contracting and Procurement** CTR	**Construction** CNS
Level 3	ENV 10 NEPA/SEPA Documentation Completion (incl. Section 4f, etc.) --- NEPA/SEPA Challenges	STG 10 Potential Changes to Structures Design (Bridge Superstructure, Retaining Walls)	DES 10 Potential Changes to geometric design (including vertical and/or horizontal alignment, earthwork, pavement, etc.)	ROW 10 Issues Associated with Development of ROW Plan	UTL 10 Utility Design Coordination and Agreements	RR 10 Railroad Design Coordination and Agreements	PSP 10 Tribal Issues	MGT 10 Change in Project Managers and/or other key Leadership	CTR 10 Change in Project Delivery Method	CNS 10 Traffic Control and Staging Issues (MOT/WZTC)
	ENV 20 ESA Issues (incl. consultation, Biologic Assessments/Biological Opinions, Fish Passage)	STG 20 Potential Changes to Geotechnical Design Foundations, Liquefaction, Mitigation, etc. --- Challenging Geotech Conditions	DES 20 Approval of Design Deviations --- Changes design criteria (i.e. track speeds, shoulder width, sight distance, etc.)	ROW 20 Uncertainty in Future ROW Escalation Rate (Project-Specific, including change in land use, urbanization, etc.)	UTL 20 Utility relocations and conflicts	RR 20 Railroad Coordination during construction (flagging, work restrictions, work windows, etc.)	PSP 20 Public Involvement Issues --- Agreements (i.e. ODOT, TriMet, C-TRAN, cities of Portland and Vancouver, etc.)	MGT 20 Delayed Decision Making	CTR 20 Issues Related to Contract Language (Contract Packaging, Warranties, Liquidated Damages, DBE, Insurance/Bonding, etc.)	CNS 20 Construction Permitting Issues during construction (incl. work restrictions)
	ENV 30 Permitting (incl. Appeals)	STG 30 Changes to Structural Design Criteria (e.g., seismic)	DES 30 Changes to Architectural, station design, CSS, Landscape Design	ROW 30 Limited Access (Interchange Justification Report - IJR, Access Hearing, etc.)		RR 30 Contractor Right of Entry Requirements	PSP 30 Additional Scope in Response to Third Party Concerns (e.g., artwork, shared-use pathways, intersection improvements, etc.)	MGT 30 Availability of Funding / Cash Flow Restrictions	CTR 30 Delays in Ad/Bid/Award Process (Addenda, Protests, etc.)	CNS 30 Work Windows (Weather, Fish, etc.)
	ENV 40 Archaeological/Cultural Discoveries, historic property impacts & mitigation (Section 106)		DES 40 Projects by other agencies affected by or affecting this project (design coordination)	ROW 40 Managed Access (Appeal Hearing, etc.)				MGT 40 Political/Policy Changes	CTR 40 Market Conditions (non-competitive bidding environment) Lack of Qualified Bidders	CNS 40 Construction Schedule Uncertainty (general, including timing of award)
	ENV 50 Hazardous Materials Groundwater and Soil Contamination (PE, RW, CN)		DES 50 Potential Changes to Design of Permanent Systems and Traffic Items (ITS, Communications, Track Electrification, Illumination, Intersection, etc.)	ROW 50 ROW Acquisition Issues (condemnation, relocations, demolitions, etc.)				MGT 50 WSDOT, ODOT, TriMet and C-TRAN Workforce Limitations	CTR 50 Delays in Procurement of Specialty Materials or Equipment and associated cost premiums	CNS 50 Marine/ Over Water Construction Issues
	ENV 60 Wetlands / Stream / Habitat Mitigation		DES 60 Design / PS&E Reviews --- Additional Scope Driven by Internal Considerations (e.g., Maintenance, Traffic Projections, Tolling, extend project terminii, change to purpose and need, etc.)	ROW 60 Additional ROW is required (including full vs partial takes): Temporary and Permanent Access Breaks - FHWA approval --- Construction / Subterranean Easements					CTR 60 Contractor Non-Performance	CNS 60 Earthwork Issues (re-use, haul, disposal, etc.)
	ENV 70 Stormwater, Potential Changes to Flow Control or Runoff Treatment/Hydraulic Requirements								CTR 70 Availability of Specialty Labor/Labor and/or Productivity Disruptions	CNS 70 Coordination with Adjacent Projects During Construction with other CRC and non-CRC projects
	ENV 80 Environmental Impacts during Construction (includng water quality, TESC etc.)									CNS 80 Contractor Access / Staging Coordination and Constructability Issues
	ENV 90 Permanent Noise Mitigation									CNS 90 Construction Accidents
										CNS 100 Transit Start-Up Issues
	ENV 900 Other Environmental Issues	STR 900 Other STR Issues	DES 900 Other Design Issues	ROW 900 Other ROW Issues	UTL 900 Other UTL Issues	RR 900 Other RR Issues	PSP 900 Other PSP Issues	MGT 900 Other MGT Issues	CTR 900 Other CTR Issues	CNS 900 Other Construction Issues (including unanticipated change orders/claims)

Figure 3-5. Risk Identification Flowchart



3.3 Qualitative Risk Analysis

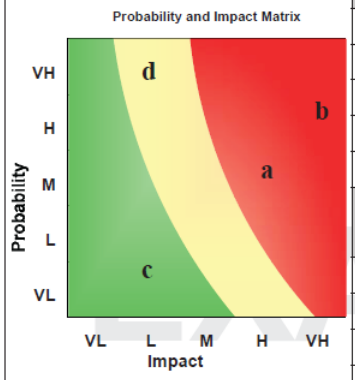
③ Qualitative Risk Analysis – can be used as a tool for screening risk to make sure we use resources effectively by focusing on risks that are most critical to project objectives. This tool is employed during risk identification when we establish minimum thresholds for risk events. Also when communicating risks many find a visual presentation more intuitive than narrative descriptions and numbers, hence risks can be depicted in a qualitative risk matrix and an example from Project Risk Management Guidance for WSDOT Projects is provided below:

Qualitative Risk Analysis ***Chapter 3***

EXAMPLE (depicts a simple list of risks evaluated and ranked qualitatively)

Qualitative Risk List

count	T/O	RBS #	Risk Title	Probability	Impact
a	T	ENV 30.1	Permits and Permit Appeals	Medium	High
b	T	UTL 20.1	Unidentified Utility Conflicts	High	Very High
c	T	STG 20.4	Change to Substructure Assumptions	Very Low	Low
d	T	ROW 40.1	Managed Access challenge	Very High	Low



Probability (Likelihood)	Synonyms		[1]Approximate %
Very high	Almost certain	Very Sure	≥ 90%
High	Likely	Pretty Sure	80%
Medium	Possible	Maybe	50%
Low	Unlikely	Seldom	20%
Very Low	Rare	Improbable	≤ 10%
Consequence (Impact)	**Synonyms**		**[1]Approximate % of Phase (PE, RN, CN)**
Very high	Very Critical	Very Strong	≥ 10%
High	Critical	Strong	8%
Medium	Moderate	Average	4%
Low	Slight	Mild	2%
Very Low	Very Little	Very Mild	≤ 1%

[1]Suggested percentages; project teams may adjust if they desire.

Source: Project Risk Management Guidance for WSDOT Projects, July 2010 page 28

3.4 Quantitative Risk Analysis

④ **Quantitative Risk Analysis –** Once risks are identified and have been screened via qualitative analysis, they can be analyzed quantitatively. Recall that identification includes a thorough description of the risk and risk triggers. With quantitative analysis the probability of occurrence and consequence if the risk event occurs must also be documented.

3.5 Risk Response

⑤ Risk Response

Critical risks must be met with vigorous response actions; lower ranking risks should receive response actions commensurate with their significance.
The output from the analysis provides a ranked risk register with the risks of greatest significance to project objectives determined. Apt response actions to significant risks must be cost effective and realistic.

Risk owner
For each risk a risk owner is appointed, the risk owner decides on possible response actions to implement and insures that the selected response is documented and incorporated into the appropriate work plans and integrated into project management plan updates as appropriate.

Documentation of Response Actions

Document the response action by describing the action, which work activities it will affect and the cost of the response action. Identify the person(s) responsible for successful implementation of the response action. Also consider the time impacts of the response action and how the risk response may affect the overall project and/or other risks.

Take action in response to identified risks. The project teams will implement the response plans focusing on risks of most significance, in order to shift the odds in favor of project success.

Risk Response requires effort to develop and implement response actions; we plan for this effort in the risk management section of our project management plan. We will also be holding a workshop with the FTA to discuss actions to be taken to mitigate risks identified, ensuring full integration and agreement as risks are resolved.
Descriptions of risk response actions:

Actions in response to risk:	Threats	Opportunities
	1. Avoid	1. Exploit
	2. Transfer	2. Share
	3. Mitigate	3. Enhance
	4. Accept	

The next three sections of this Risk and Contingency Management Plan (RCMP), sections 3.5.1, 3.5.2, and 3.5.3 describe available response actions to identified risks. The descriptions of the response actions reflect the type of action that will occur with each of the identified responses for threats and opportunities and of course what it means to "accept" a risk. The Project Management Body of Knowledge (PMBOK) was referred to for developing the descriptions for threat and opportunity responses and a book titled "Effective Opportunity Management for Projects" by David Hillson was referred to when developing the description for "accept."

3.5.1 Risk Response Actions (threats)

AVOID (threats) *- Action taken to insure the probability or impact of a threat is eliminated.* Avoidance actions include: change the project management plan to eliminate a threat, to isolate project objectives from the risk's impact, or to relax the project objective that is in jeopardy, such as extending a schedule or reducing the scope. Some risks that arise early in the project can be avoided by clarifying requirements, obtaining information, improving communication, or acquiring expertise.

TRANSFER (threats) - *Action to allocate ownership for more effective management of a threat.* Transferring a threat does not eliminate it; the threat still exists; however, it is owned and managed by another party. Transferring risk can be an effective way to deal with financial risk exposure. Transferring project risk almost always involves payment of a risk premium to the party taking the risk. Examples include: insurance, performance bonds, warranties, etc. Contracts may be used to transfer specified risks to another party.

MITIGATE – or reduce (threats) - *Action to reduce the probability and/or impact of a threat.* Risk mitigation implies a reduction in the probability or impact of an adverse risk event to an acceptable threshold. Taking early action before the risk has occurred is often more effective than trying to repair the damage afterward. Examples of mitigation strategies include: adopting less complex processes, conducting more tests or field investigations, or developing a prototype. One measure to address an impact can be to target linkages that determine the severity, such as designing redundancy into a subsystem. Redundancy may reduce the impact from a failure of the original component.

3.5.2 Risk Response Actions (opportunities)

EXPLOIT (opportunities) - *Action taken to insure the benefit of an opportunity is realized.* This strategy is the opposite of 'avoid.' The strategy is intended to insure a positive impact; an opportunity is realized by taking action to make certain the opportunity happens. Such response actions include: assigning appropriate resources to a project to reduce cost or time to complete.

SHARE (opportunities) - *Action to share with a third party; enhance or exploit an opportunity.* Sharing a positive risk involves allocating ownership to a third party who is best able to capture the opportunity for the benefit of the project. Examples of sharing actions include forming risk-sharing partnerships, teams, or joint ventures, which can be established with the express purpose of managing opportunities.

ENHANCE (opportunities) - *Action to enhance opportunity.*
This response increases the benefits of an opportunity by increasing the probability or impact. This strategy seeks to facilitate or strengthen the cause of the opportunity, and proactively target and reinforce its trigger conditions. Impact drivers can also be targeted, seeking to increase the project's susceptibility to the opportunity.

3.5.3 Risk Response Actions (acceptance)

ACCEPT - *Action taken to document the acceptance of the risk.*
The term "accept" refers to risks that remain after response actions, or for which response is not cost effective. This strategy simply means that a decision has been made to live with the consequences of the risks should they occur. Risks that are uncontrollable are 'accepted'; no response actions are realistically available.

3.6 Monitoring and Control

⑥ Monitoring and Control

Monitoring Primary Mitigation (also see chapter 5)

After we have implemented response actions, we track and record their effectiveness and any changes to the project risk profile. We report on the response actions and whether they have had a positive or negative effect on achieving project objectives. This becomes an ongoing effort of monitoring and controlling project risks.

Response tools and strategies are wide and varied, effective response actions frequently involve enhanced communication and coordination. Regular updates of project schedules, estimates and review of work activity sequencing with the project team and support groups fosters openness and transparency. These reviews contribute to good working relationships and opportunities to resolve issues and explore risk response actions.

While there are things we do not control that can affect project development and delivery we do have control over our state of readiness, we can look ahead and improvise and adapt. We can control the robustness of our response to identified risk events and the quality of our documentation. We have control over how earnestly we integrate risk management into our project management plans. We control monitoring and reporting capabilities.

Monitoring and controlling risk involves observing and reporting on the following:

- Risk response actions that have been implemented and carried out;
- Performance of the response actions (cost of response, estimated risk reduction, and effectiveness);
- If a risk trigger has occurred or appears imminent;
- Residual risks that remain after response actions;
- New risks that have not previously been identified;
- Project assumptions are still current and correct;

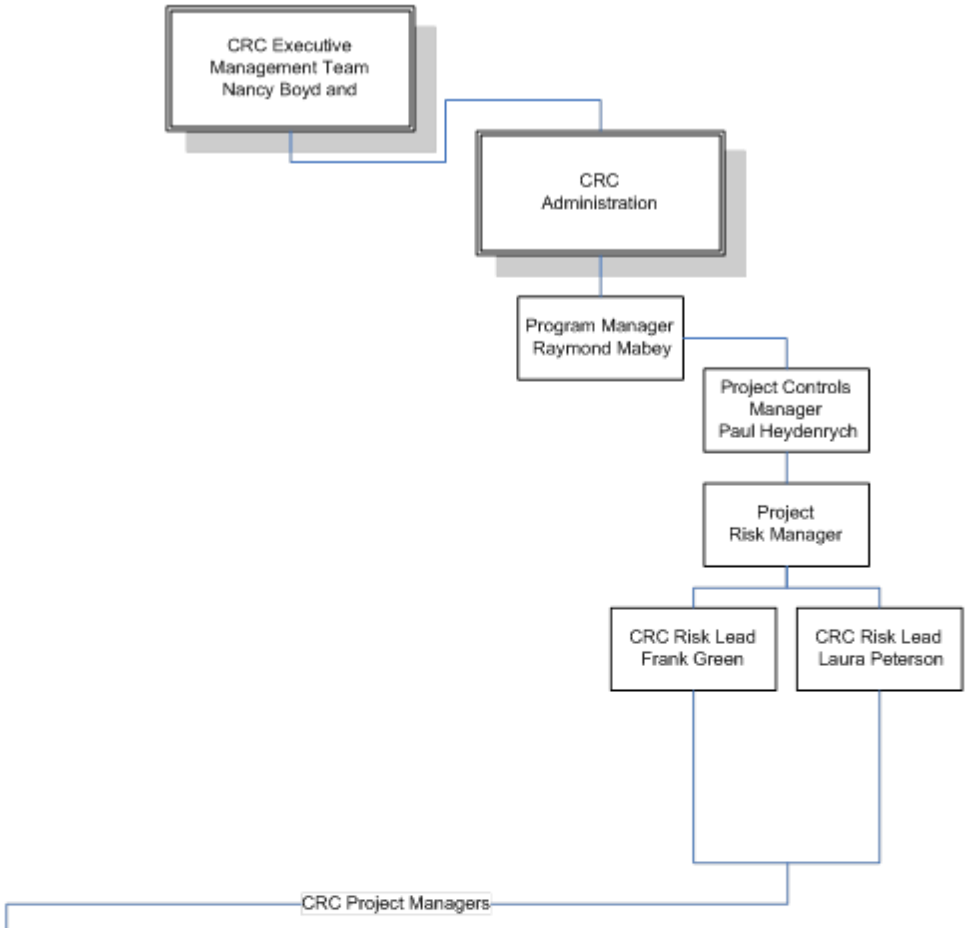
As we continue through project development the project risk profile will change. Typically as we successfully respond to risks and our project knowledge increases our risk exposure will diminish. In effect we can retire risk reserve as risk events are successfully avoided or mitigated or we have passed the time during which the risk is active and it becomes retired.

Documentation of Monitoring and Control

Monitoring and controlling project risk involves determining whether a project is tracking to plan or deviating in a negative manner. This will require a blend of qualitative judgments and quantitative measures to determine the "health" of the project delivery effort.

Risk response actions are evaluated and implemented, if the response action involves a change, the change will be implemented following the procedures in Section 3.6.3 of the Project Management Plan for the Columbia River Crossing project. Figure 3-6 depicts the Project Risk Management Organization.

Figure 3-6. Project Risk Management Organization



Project Development Planning and Procurement Contract List (Full Funding Grant Agreement)

1	Columbia River Bridges and Approaches
2	Columbia River Interstate Bridge Removal
3	Mainland Connector Bridge and Approaches
4	Marine Drive Interchange Reconstruction
5	Washington Transit
6	Park and Ride Garages
7	Transit Systems
8	Ruby Junction – Phase II Expansion
9	Steel Bridge Modifications
10	Light Rail Vehicle Procurement
11	Command Center Upgrades/Modifications
12	Ticket Vending Machine Procurement
13	Transit Owner Furnished Materials Procurement
14	Pre-Completion Tolling
15	Sandy River Habitat (mitigation)

Roles

Public (as represented by Legislatures)

- The CRC is obligated to managing risk and contingency while being financially responsible to the greater good of the public as determined by the legislature.

CRC Director and Executive Leadership Responsibilities (full time)

- Promote and provide support for active project risk management.

CRC Risk Manager Responsibilities

- Direct and manage day-to-day risk management process for the project including regularly schedule risk management and review meetings as proposed in section 4.
- Prepare and update the project risk management plan, including: schedule for key check-in milestones for the risk management plan, risk workshops; insure quality of risk data and analysis.
- Work with Strategic Analysis and Estimating Office to coordinate pre-workshop, workshop and post-workshop activities, including internal and external participants.
- Track and monitor effectiveness of risk response actions.
- Promote risk management activities within the project team and with stakeholders.
- Communicate with project managers on all matters related to risk management including:
- Review of response actions.
- Confirm deadlines for response implementation.
- Revise and update risk response plan as appropriate.
- Revise and update risk registers as appropriate.
- Work with directors when key risk-related program level decisions are needed.

Project Managers (full time)

- Promote aggressive risk management for their projects and participate in risk workshops.
- Manage active risks for their project/either serve as the risk manager for their project or designate an appropriate person to fill this roll for their team.
- Manage use of contingency risk reserve for their projects; obtain director approval for contingency risk reserve that exceeds their authorized limit.

- Review and endorse the project risk management plan and updates.
- Review and monitor response actions particularly for significant risks.
- Communicate to senior management about the project risk and response actions.

Risk Owner (Action Owner) **(full time to project/as needed to the risks they own)**

- Implement agreed upon response actions.
- Report on effectiveness of responses to the project manager/risk manager and affected project team members; including the need for additional risk response actions.
- Identify new risks that may emerge after response actions.

Project Team Members (full time to project)

- Maintain a state of risk awareness for the project.
- Document actions and report to project risk manager for risk management updates.
- Monitor response actions and document how it affects project design and development.
- Communicate with project manager about risk management actions and changing project key risks (addition of new risks or retirement of old risks –as appropriate).

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4. Insurance

4.1 Overview

This chapter conforms to the Columbia River Crossing (CRC) Risk and Contingency Management Plan (RCMP). Consistent with the Federal Transit Authority (FTA) Oversight Procedures 40 (OP 40) document, this Chapter of the RCMP and Chapter 5 of the PMP includes a summarized discussion of current or future major insurances, for the Columbia River Crossing program.

WSDOT is the grantee for FTA's transit grants and serves as a co-lead agency with ODOT for the overall multimodal project. In the Program organization, Insurance and Risk Management, is the responsibility of the Director of Project Controls. WSDOT, the grantee, organizes program risk management into two areas of responsibility: Enterprise Risk Management and Project Risk Management.

The Enterprise Risk Management Office (ERMO) of WSDOT provides a variety of services to help with a wide range of insurance, risk and legal issues. Enterprise risk management deals with the risk transfer and finance mechanisms associated with insurable risks.

In consultation with WSDOT, ODOT and TriMet Risk Management, Enterprise Risk Management is responsible for evaluating , administering and coordinating the insurance and claims for the program, which includes:

- Identifying the loss exposures and evaluating the best methods to protect the interests of the project and agencies.
- Determining the appropriate coverage types and limits.
- Developing and administering a claims management program to coordinate property, liability and workers compensation claims, including property damage recoveries.
- Conducting risk analysis.
- Managing CRC's Insurance program, monitoring the contractor insurance program.
- Assisting in litigation management.
- Reviewing contracts, lease agreements and other legal documents for assumption and transfer of risk.

The CRC Program will take the necessary actions to protect against risk in a fiscally responsible manner and to coordinate the insurance needs of the agencies.

This RCMP describes how the team will deal with uncertainty and risks that affect project objectives, most notably cost and schedule. Project risk management is an ongoing and integral part of project management and is performed throughout the life of the project.

The Risk Manager, in cooperation with the Deputy Transit Manager, provides leadership and guidance to various agency staff from WSDOT and ODOT (co-lead agencies) and partnering transit agencies (TriMet and C-TRAN) and is responsible for the day-to-day coordination of the following activities:

- Identifying the best method to protect WSDOT, ODOT, TriMet, and C-TRAN from risk exposures due to the CRC Program.
- Determining the degree of indemnification and/or insurance protection requirements for consultants and contractors providing services to the CRC.
- Preparing and implementing the Risk and Contingency Management Plan (RCMP).

4.2 Risk Management

The WSDOT Cost Estimation Validation Process (CEVP) and FTA Risk Assessment (RA) are tools that help us identify and manage risks on a particular project. These processes are further defined in the other chapters of this RCMP. Risk registers include both cost and schedule attributes which are included in an integrated model for analysis. Key risks identified for CRC are quantified for both cost and schedule. These risks are identified, defined, quantified, and analyzed to effectively use resources in response to risks.

The risk review process and development of a risk management plan include the following steps:

- Risk Management Planning.
- Risk Identification.
- Analyses of risks (Qualitative and Quantitative).
- Risk Response (analyses of risk treatment alternatives, i.e., avoidance, prevention, mitigation/cost control, and insurance).
- Assignment of risk.
- Selection of risk treatment.
- Monitoring and evaluating performance of the chosen risk treatments.

The main objective of the CRC program is to respond to identified threat risks and make the most of opportunities. The CRC team will manage risks for each of its projects and provide rapid updates throughout program delivery. The information the team will manage includes:

- Risk profile (program level and project level).
- Status of key significant risks (monitor and control capabilities):

- Response actions taken.
- Cost of response actions.
- Results of response actions.
- Current status of risk (active, retired).
- Summary of risk management efforts and outcomes.

This RCMP describes areas of risk assessment focus that were identified through the risk review process completed during the Preliminary Engineering phase and that will continue to be implemented throughout the life of the project. The RCMP for the CRC Program is consistent with WSDOT, ODOT, TriMet, C-TRAN, and FTA processes and standards. RCMP components (as listed in the Table of Contents of this document):

1. Overview – summarizes how the RCMP fits into the overall project management plan.
2. Goals and Objectives – for risk and contingency management for CRC.
3. Risk Review Process – procedures which describe risk identification, risk assessment, risk response, risk protection measures (such as Secondary Mitigation and minimum contingencies) and risk management and control.
4. Insurance –summarizes use of insurance at CRC (see also chapter 5 of the PMP).
5. Primary Mitigation – describes *response* actions to mitigate the impact of identified key risks.
6. Contingency Management – describes cost and schedule contingency protections including contingency recommendations and management of cost contingency and schedule contingency.
7. Secondary Mitigation – describes the use of secondary mitigation and a list of items and timing necessary for implementation of secondary mitigation actions.
8. Risk Management and Risk Mitigation –describes administration and maintenance of this RCMP, including:

    a. Identification and analysis of project risk;
    b. Risk response options (primary and secondary);
    c. Risk monitoring and control;
    d. Documenting and reporting to FTA.
    e. Design control processes;
    f. Plans for updating the risk register;
    g. Plans and timing for updating the RCMP.

WSDOT will treat risk analysis separately from the base cost estimates during Engineering (Final Design). This allows a more rigorous and objective approach to this important component

of the CRC Program, and includes anticipated variances in the base cost (for example, in unit costs and quantities) and the impact of risk events.

Active risk management includes convening risk workshops, updating the risk register, identifying and quantifying new risks, and ensuring that risk response strategies are successfully implemented. Workshops are typically conducted annually until contracts are awarded. The Risk Owner assigned to each risk will monitor the effectiveness of the current risk management strategy, assess any unanticipated effects, and recommend any mid-course corrections to the CRC Management Team.

In addition, in the risk register, risks are identified as "owner", "contractor", or "shared" with respect to where the risk most appropriately resides. In March of 2013 a workshop was held that reviewed and validated the allocation of the Design-Build contract risks as owner, contractor or shared. As new risks are identified this allocation will be included as part of the information in the risk register for the identified risk.

The WSDOT Cost Risk and Estimate Management (CREM) office developed a spreadsheet to track risk and modified it for transit elements. This spreadsheet offers a preliminary understanding of how to avoid or mitigate for risks if they occur. Proper tracking of risks helps internal and external communication among partners, stakeholders, the CRC Program's managers, and staff as well as independent teams at risk workshops.

4.3 Enterprise Risk Management

WSDOT's program risk management is broken down into two areas of responsibility – Enterprise Risk Management and Project Risk Management. Project risk management is discussed in detail in this document.

Enterprise risk management deals with the risk transfer and finance mechanisms associated with insurable risks. In consultation with WSDOT, ODOT, and TriMet Risk Management, Enterprise Risk Management is responsible for evaluating, administering, and coordinating the insurance and claims for the Program, including the following:

- Coordinating insurance requirements between TriMet, ODOT, and WSDOT by the following:
- WSDOT Enterprise Risk Management Office (ERMO), guide by the Enterprise Risk Management Manual, M 72-01, October 2012.
- ODOT Department of Administrative Services, Procurement Office, Insurance and Procurement Manager.
- TriMet
- [2]Claims will be processed through the appropriate offices as delineated in the [3]interagency agreements and contracts.

[2] Claims include, but are not limited to, Tort claims, Recovery claims, and insurance.
[3] Interagency agreement includes WSDOT, ODOT and TriMet.

- Indemnifying the loss exposures of the CRC Program and evaluating the best methods to protect the interests of the project and agencies.
- Determining the appropriate coverage types and limits.
- Developing and administering a claims management program to coordinate property, liability, and workers compensation claims, including property damage recoveries.
- Conducting risk analysis for insurance coverages.
- Managing the insurance program, including monitoring the contractor insurance program.
- Assisting in litigation management.
- Reviewing contracts, lease agreements, and other legal documents for assumption and transfer of risk.

The CRC Program will consult with professionals, knowledgeable in the field of insurance, to take the necessary actions to protect against risk in a fiscally responsible manner and to harmonize the insurance needs of the agencies during the preparation of the Request For Proposal, RFP and other procurement documents for approved project packages.

4.3.1 Insurance

Insurance is one of the risk transfer and finance mechanisms for CRC Program loss exposures. Given the various contracting agencies and packages, and the unique loss exposures of the project, the project is approaching risk financing in a thoughtful, diligent manner. The Program will coordinate with the WSDOT, ODOT, and TriMet Risk Management groups to develop and enforce contract indemnification and insurance requirements to protect against loss. During Engineering (Final Design) and prior to issuing the RFQ/RFP, the Program will work with the WSDOT, ODOT, and TriMet Risk Management groups to study the best method of protecting the Program and the contracting agencies. This review process will give the project team a thorough understanding of the loss exposures and identified risks associated with each contracting package.

The Program will evaluate risk transfer and finance through:

- All appropriate insurance cover types and amounts. During development of the RFP legal and Insurance Professionals will review the language regarding insurance coverage.

As described in Chapter 5 of the Project Management Plan (PMP), minimum insurance coverage types may include, but are not limited to:

Workers' Compensation	Commercial General Liability
Automobile Liability	Environmental Liability
Excess Liability	Railroad Protective Liability
Builder's Risk	Marine Liability
Aircraft Liability	Verification of Coverage
Contractor's Protective Liability	Endorsements and Waivers
Subcontractor Insurance Requirements	Changes in Requirements
Waivers of Subrogation	Support of Indemnifications
No recourse	Grantee's Right to Remedy Breach
Commercial Unavailability Alternatives	Claims Relating to Differing Site Conditions
Insurance Proceeds and Prosecution of Claims	Disclaimer
Commencing of Work	
Revenue disruption for tolling due to catastrophic loss	
Professional Liability (including consideration of design errors and multistate inspection)	

Insurance will be consistent with:

TriMet standard practices for insurance requirements on contracts.
WSDOT Standard Specifications M41-10, Chapter 1-07, 2012.
ODOT/APWA Oregon Chapter, Volume 1, 00170.70.
Interagency Agreements.

4.3.2 Preconstruction Surveys

It is anticipated that the Design-Builder will require a pre-construction survey to examine and monitor select buildings, utilities, and underground structures within areas potentially influenced by CRC Program's construction activities. The preconstruction survey will assess and record any existing cracks or damages, and provide a preconstruction record of the facilities in the event that any damage is claimed as a result of the CRC Program's construction activities. During construction, if any deep excavations adjacent to existing structures are required, the vibration consultant may use ground movement monitoring instruments. The need for any such instrumentation will be decided through discussions with the project engineer and the structural engineer. Post-construction surveys may also be conducted if there are reasons to believe that damage may have occurred or if a claim is filed.

5. Primary Mitigation

This chapter describes how the CRC team will take action in response to identified risks by focusing on risks of most significance. Primary mitigation is achieved through continuous risk management and risk response. This chapter also highlights the top risks at the time of writing this RCMP.

5.1 Technical Capacity and Capability

Technical Capacity risks identified for the CRC project are related to workforce and management limitations as well as turnover of staff. We are currently monitoring one active Technical Capacity and Capability risks, listed below in Table 5-1.

Table 5-1. Technical Capacity and Capability Risks

Project	River Crossing and Approaches	**Risk ID**	RC RC MGT 20.01
Sub-Project	RC	**Status**	Active

Delayed Project Decision Making

Risk Trigger		**Flowchart Activity Number (s)**	100, 415
Risk Type	Both	**Primary Mitigation Category**	TCC
Risk Category	RQ	**SCC Number**	80.03
CRC Risk ID	152	**Dependency & Correlation**	

Pre-Response Quantification

Probability	**Low**	**Most Likely**	**High**	**Modeled EV Delay Cost**	**Total Expected Value Impact**	**Program Rank**	**Date Pre Last Updated**
75%						6	
Cost ($M)	$0.00	$0.00	$0.00	$11.54	$11.54	**Project Rank**	10/26/2012
Schedule (Mo)	1.00	3.00	6.00		2.38	6	

Many different decision making entities both internal and external .

Post-Response Quantification

Probability	**Low**	**Most Likely**	**High**	**Modeled EV Delay Cost**	**Total Expected Value Impact**	**Additional Cost to Respond**	**Date Post Last Updated**
25%						$0.00	
Cost ($M)	$0.00	$0.00	$0.00	$11.54	$11.54	**Strategy**	10/18/2012
Schedule (Mo)	1.00	3.00	6.00		0.79	Mitigate	

10/17/2012 meeting with Nance B, Ray M, Frank G, and Laura P - timely decision making is always an area of interest; in addition some of the other risks in the register reflect the need for timely decisions- hence this risk remains however the probability is reduced from 75% to 25%.

Identify decisions that are being delayed and why. Increased communication amongst key decision makers.

Monitoring and Control

Risk Owner	**Risk Aging**		**Status Interval**
Boyd, Nancy		**From** 5/23/2012	
		To 3/29/2013	Monthly

Review Comments	**Last Review**	**Date MC Last Updated**
9/19/2012 key decisions pending include: release of RFP; start of ROW acquisitions; any decision affecting critical path schedule or dashboard items. 8/15/12 Roger Kitchin and Paul Heydenrych - Organization chart revision in progress, 7/18/2012 Roger Kitchin and Paul Heydenrych - review decision making process with Ray Mabey - and produce a documented decision making process.	8/15/2012	12/5/2012
	Affected Projects	
	"RC", "MC", "OT", "PR", "TS", "TO", "RCD", "MD", "WAN"	
	Next Review	**Risk Assignment**
	9/19/2012	Owner

RC.RC.MGT.20.01	Delayed Decision Making

5.2 Requirements Risks

Requirements risks relate to the establishment and variability of fundamental goals and conditions to which the project design must respond, as well as the Grantee's activities to identify these goals and conditions. A number of requirements risks have been identified for this project and will be reviewed and quantified at subsequent Cost Estimate Validation Process workshops.

There are 35 active requirements risks. Three of the more significant active requirements risks, identified for the CRC project, are listed below in Table 5-2, followed by detailed risk identification sheets for these risks.

Table 5-2. Requirements Risks

WT.WT.MGT.30.01	Failure to obtain C-TRAN O&M funding commitment in a timely manner
RC.RC.MGT.20.07	Issues with FFGA not resolved in a timely manner
WT.WT.CTR.900.05	City of Vancouver permit delays

Project	Washington Transit	Risk ID	WT WT MGT 30.01
Sub-Project	WT	Status	Active

Failure to obtain C-TRAN O&M funding commitment in a timely manner

Risk Trigger	Vote Fails	Flowchart Activity Number (s)	410
Risk Type	Transit	Primary Mitigation Category	CEF
Risk Category	RQ	SCC Number	80.03
CRC Risk ID	102	Dependency & Correlation	

Pre-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Program Rank	Date Pre Last Updated
10%						78	
Cost ($M)	$0.00	$0.00	$0.00	$0.23	$0.23	Project Rank	2/21/2013
Schedule (Mo)	6.00	9.00	12.00		0.90	6	

Identifying suitable alternatives if the ballot measure doesn't pass. This would lead to a delay in FTA approval to enter FD. (See Risk 071 to prevent duplication.) C-Tran has an expert review panel to analyze alternative O&M funding alternatives. This risk is that the funding sources are not committed as of yet which is necessary for FFGA application, that is the delay. If the vote fails it forces C-tran and the project to seek alternative funding sources which will take time. Delay if this funding source is not available is assumed 6 months on the low end and one year on the high end.

Post-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Additional Cost to Respond	Date Post Last Updated
50%						$0.00	
Cost ($M)	$0.00	$0.00	$0.00	$0.23	$0.23	Strategy	10/25/2012
Schedule (Mo)	0.00	1.00	2.00		0.50	Mitigate	

10/17/2012 per meeting with Nancy B, Ray M, Frank G, and Laura P - this risk was revised --the impact is reduced from 6, 9, 12 months to 0, 1, 2, months.

There may be other sources to mitigate the O&M gap.

Monitoring and Control

Risk Owner	Risk Aging		Status Interval
Ficek, Gary		From 8/22/2012	
		To 11/6/2012	Quarterly

Review Comments

02/21/2013 - SCC code updated per Marc Guichard review
02/20/2013 - Marc Guichard - CTRAN will have internal workshop/retreat on February 23, 2013 - develop a plan on funding operations and maintenance.
11/13/2012 - the vote failed to pass - need to expend effort to resolve concens associated with identifying funding for C-TRAN operations and maintenance.
10/17/2012 meeting with Nance B, Ray M, Frank G, and Laura P - if the vote fails significant effort and energy will be expended to resolve the concerns associated with this risk in a timely fashion.

Last Review	Date MC Last Updated
10/17/2012	2/21/2013

Affected Projects

"WT"

Next Review	Risk Assignment
11/7/2012	Owner

WT.WT.MGT.30.01	Failure to obtain C-TRAN O&M funding commitment in a timely manner

Project	River Crossing and Approaches	Risk ID	RC RC MGT 20.07
Sub-Project	RC	Status	Active

Issues with Full Funding Grant Agreement (FFGA) are not resolved in a timely manner

Risk Trigger	Change in FTA Policy	Flowchart Activity Number (s)	415
Risk Type	Both	Primary Mitigation Category	CEF
Risk Category	RQ	SCC Number	80.03
CRC Risk ID	104	Dependency & Correlation	

Pre-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Program Rank	Date Pre Last Updated
25%						67	
Cost ($M)	$0.00	$0.00	$0.00	$0.67	$0.67	Project Rank	2/21/2013
Schedule (Mo)	1.00	2.00	5.00		0.58	48	

Other than the Ctran O&M funding source risk 102. Issues with the advancement of project design would hinder FFGA. The FTA will require the design is sufficiently advanced to reduce the risk so the budget falls within the budget put forth in the financial plan. There is some requirement on the highway side for level of design. Main three issues for FTA are capacity issues, funding issues, and cost issues from design and schedule could delay the FFGA. FTA needs to receive documents that these issues are resolved. Cost is minimal.

Reviewed 10-17-2012 this risk is now requantified to incur a uniform 12 month delay if this risk occurs as if the milestone is missed have wait another year.

Post-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Additional Cost to Respond	Date Post Last Updated
25%						$0.00	
Cost ($M)	$0.00	$0.00	$0.00	$0.67	$0.67	Strategy	10/22/2012
Schedule (Mo)	1.00	2.00	5.00		0.58	Mitigate	

Maintain relationship with federal delegation identify any changes that may occur with the FTA funding process. Continue working with FTA and PMO.

Monitoring and Control

Risk Owner	Risk Aging	From	12/13/2012	Status Interval
Boyd, Nancy		To	12/19/2014	Monthly

Review Comments

02/21/2013 - SCC code updated per Marc Guichard review
10/22/2012 - per review and discussion this risk is confirmed by Doug Jones, Marc Guichard, Vicki Smith, Gary Ficek.
10/17/2012 meeting with Nancy B, Ray M, Frank G, and Laura P - this risk revised back to earlier quanitfication of 1 to 5 months with 2 months most likely. The issue of a significant delay to the project is being considered and will be run as a separate scenario.
10-17-2012 quantification was corrected to reflect a one year delay if this risk occurs. W King, D Jones et al

Last Review	Date MC Last Updated
10/17/2012	2/21/2013

Affected Projects

"RC", "MC", "PR", "TS", "RCD"

Next Review	Risk Assignment
11/21/2012	Owner

RC.RC.MGT.20.07	Issues with FFGA not resolved in a timely manner

Project	Washington Transit	Risk ID	WT WT CTR 900.05
Sub-Project	WT	Status	Active

City of Vancouver permit delays

Risk Trigger	Permit Application	Flowchart Activity Number (s)	160
Risk Type	Transit	Primary Mitigation Category	REQ
Risk Category	RQ	SCC Number	80.06
CRC Risk ID	123	Dependency & Correlation	

Pre-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Program Rank	Date Pre Last Updated
10%						87	
Cost ($M)	$0.00	$0.00	$0.00	$0.00	$0.00	Project Rank	2/21/2013
Schedule (Mo)	1.00	2.00	3.00		0.20	8	

City of Vancouver has never permitted light rail previously. This could potentially result in delays to receiving local land use permits (Permits listed in review /status report). Low likelihood as there is a good amount of time in the new schedule due to project delaying about a year.

Post-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Additional Cost to Respond	Date Post Last Updated
10%						$0.00	
Cost ($M)	$0.00	$0.00	$0.00	$0.00	$0.00	Strategy	8/22/2012
Schedule (Mo)	1.00	2.00	3.00		0.20	Mitigate	

Work closely w ith COV and plan for any delays w ithin the Master Permitting Plan and Schedule. Develop MOA/IGA w ith COV to help advance permit process. Continue regularly scheduled CRC/COV meetings.

Monitoring and Control

Risk Owner	Risk Aging	From	12/13/2012	Status Interval
Wills, Heather		To	12/19/2015	Monthly

Review Comments

02/21/2013 - SCC code updated per Marc Guichard review
12/13/2012 - Heather Wills risk ow ner.

Last Review	Date MC Last Updated
9/19/2012	2/21/2013

Affected Projects

"MC", "WT"

Next Review	Risk Assignment
3/20/2013	Ow ner

WT.WT.CTR.900.05 | City of Vancouver permit delays

5.3 Design Risks

Design risks are associated with the performance and variability of design-related activities occurring after alternatives analysis. There are 55 active design risks. three of the more significant design risks, identified for the CRC project, are listed below in Table 5-3.

Table 5-3. Design Risks

RC.RC.ENV.30.04	USACE 408 navigation channel authorization may require additional design information on the main river crossing or harbor bridges than currently available
RC.RC.STG.10.02	An increase to the aesthetic costs/context sensitive solutions for Columbia River Bridge, both structural and non-structural caused by stakeholder input.
RC.RC.CTR.10.02	Project is redesigned to accommodate new staging/phasing.

Project	River Crossing and Approaches	Risk ID	RC RC ENV 30.04
Sub-Project	RC	Status	Active

USACE 408 navigation channel authorization may require additional design information on the main river crossing and/or harbor bridges than currently available

Risk Trigger		Flowchart Activity Number (s)	192
Risk Type	Both	Primary Mitigation Category	DSN
Risk Category	DS	SCC Number	80.02
CRC Risk ID	168	Dependency & Correlation	

Pre-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Program Rank	Date Pre Last Updated
65%						8	
Cost ($M)	$0.00	$0.00	$0.00	$9.62	$9.62	Project Rank	2/21/2013
Schedule (Mo)	1.00	2.00	3.00		1.30	8	

USACE is more familiar with design-bid-build than design-build projects, and may desire more documentation than is currently available. Channel modifications require approval at the national level. Mutually inclusive with 167. Updated pre impacts 10-17-2012

Post-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Additional Cost to Respond	Date Post Last Updated
20%						$0.00	
Cost ($M)	$0.00	$0.00	$0.00	$9.62	$9.62	Strategy	10/18/2012
Schedule (Mo)	1.00	2.00	3.00		0.40	Mitigate	

10/17/2012 - Right now the plan is to work on getting USACE under contract to cover their expenses for review and coordination at a cost of 2.3M (1.3M for navigation and 1.0M to levees) this cost is included in the base cost.

There has been much coordination with the Corps and a better understanding of what they require is now known. This delay is with respect to the updated base schedule date of July 2014.

Monitoring and Control

Risk Owner	Risk Aging	From		Status Interval
Wills, Heather		To		Monthly

Review Comments

02/21/2013 - SCC code updated per Marc Guichard review
10-17-2012 reviewed and confirmed by Steve Morrow and Laurie Line
9/19/2012 - Risk Trigger - results of navigation simulation; Doug Jones: dates on Federal Dashboard are triggers that determine if our level of design is acceptable. Laura Peterson/Doug Jones - break this risk into two separate risks: the main river crossing and mainland connectors.

Last Review	Date MC Last Updated
9/19/2012	2/21/2013

Affected Projects

"RC", "OT", "TO"

Next Review	Risk Assignment
9/17/2012	Owner

RC.RC.ENV.30.04 | USACE 408 navigation channel authorization need additional information

Project	River Crossing and Approaches	Risk ID	RC RC STG 10.02
Sub-Project	RC	Status	Active

There is an increase to the aesthetic costs/context sensitive solutions for Columbia River Bridge, both structural and non-structural caused by stakeholder input.

Risk Trigger	RFP development - Architectural Standards	Flowchart Activity Number (s)	250 (90%), 251 (10%)
Risk Type	Both	Primary Mitigation Category	DSN
Risk Category	DS	SCC Number	10.04
CRC Risk ID	79	Dependency & Correlation	

Pre-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Program Rank	Date Pre Last Updated
50%						9	
Cost ($M)	$5.00	$15.00	$30.00	$1.32	$9.24	Project Rank	2/21/2013
Schedule (Mo)	0.00	0.00	0.00		0.00	9	

Base assumes composite deck truss bridge with standard piers, light standards, open structural sections (rather than closed box sections), etc. May increase bridge costs 5% to 10%.

Post-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Additional Cost to Respond	Date Post Last Updated
50%						$0.00	
Cost ($M)	$5.00	$15.00	$30.00	$1.32	$9.24	Strategy	10/23/2012
Schedule (Mo)	0.00	0.00	0.00		0.00	Mitigate	

Actively manage work of architect involved in RFP development to ensure that RFP aesthetic requirements are detailed, reasonable and cost-effective.

Putting an explicit limit into the RFP may reduce the likelihood of this risk occuring. 10-17-2012 F. Green The aesthetic improvements could also be structural in nature.

Monitoring and Control

Risk Owner	Risk Aging	From	2/1/2013	Status Interval
Green, Frank		To	2/28/2014	Quarterly

Review Comments	Last Review	Date MC Last Updated
02/21/2013 - SCC code updated per Marc Guichard review 7/18/2012 Frank Green to monitor - mitigate/active manage archtect work to insure requirements are met and are reasonable and cost effective.	12/13/2012	2/21/2013
	Affected Projects	
	"RC"	
	Next Review	Risk Assignment
	12/19/2012	Owner

RC.RC.STG.10.02 | Increased costs due to aesthetic costs/context sensitive solutions for CRB

Project	River Crossing and Approaches			Risk ID	RC RC CTR 10.02		
Sub-Project	RC			Status	Active		

Project is redesigned to accommodate new staging/phasing.

Risk Trigger	Funding Delay			Flowchart Activity Number (s)	100		
Risk Type	Both			Primary Mitigation Category	DSN		
Risk Category	DS			SCC Number	80.02		
CRC Risk ID	45			Dependency & Correlation			

Pre-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Program Rank	Date Pre Last Updated
50%						7	
Cost ($M)	$1.00	$2.00	$3.00	$8.78	$9.78	Project Rank	2/21/2013
Schedule (Mo)	2.00	4.00	6.00		2.00	7	

Generally there's a risk of increased cost and schedule delay if the project has to be redesigned to accommodate phasing. Current design has some phasing assumed in it. Phasing risk will be triggered by funding delays. This covers the design costs (perfectly correlated to related to Risk ID 052). This is the possibility for design for temporary work not as assumed in the base.

Post-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Additional Cost to Respond	Date Post Last Updated
10%						$0.00	
Cost ($M)	$1.00	$2.00	$3.00	$8.78	$8.98	Strategy	10/25/2012
Schedule (Mo)	1.00	2.00	3.00		0.20		

Phasing will be in response to other financial pressures. Develop a cooridor wide Traffic management plan that is alignment with available funding

10/24/12--Concepts have been developed that integrate initial construction proposal and lessen this risk.

Monitoring and Control

Risk Owner	Risk Aging	From	2/14/2013	Status Interval
Niemi, Mike		To	7/31/2013	Monthly

Review Comments	Last Review	Date MC Last Updated
02/21/2013 - SCC code updated per Marc Guichard review 9/19/2012 - Laura Peterson - this risk has been partially realized by defining the ICP. 7/18/2012 Casey Liles to monitor and actively work through design to develop corridor wide traffic management plan as that is in alignment with available funding and forward compatbility.	9/19/2012	2/21/2013

Affected Projects	Next Review	Risk Assignment
"RC", "MC", "PR", "TS", "TO", "RCD", "MD", "WAN"	10/17/2012	Owner

RC.RC.CTR.10.02	Project is redesigned to accommodate new staging/phasing.

5.4 Delivery Methods and Contracting Risks

Delivery Methods and Contracting risks are largely tied to issues surrounding contracting strategy and the management and oversight of contractors. This is an area of ongoing examination and consideration on the CRC project. One key opportunity risk was identified as summarized below in Table 5.1-4, a detailed risk identification sheet for this opportunity is provided on the following page.

Table 5-4. Delivery Methods and Contracting Risks

RC.RC.CTR.20.02	**P**erformance specifications are added enhancing **possible** design builder innovation

Project	River Crossing and Approaches	Risk ID	RC RC CTR 20.02
Sub-Project	RC	Status	Active

Additional performance specifications are added enhancing the possibility for design builder innovation

Risk Trigger		Flowchart Activity Number (s)	250 (90%), 251 (10%)
Risk Type	Both	Primary Mitigation Category	DMC
Risk Category	DS	SCC Number	10.04
CRC Risk ID	120e	Dependency & Correlation	

Pre-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Program Rank	Date Pre Last Updated
20%						14	
Cost ($M)	-$50.00	-$25.00	-$10.00	-$0.89	-$6.23	Project Rank	2/21/2013
Schedule (Mo)	0.00	0.00	0.00		0.00	13	

Opportunity to encourage DB innovation. Include pre-approved design exceptions in RFP and include list of design exceptions that will not be allowed. Prescriptive specifications can limit possible ATC's. More performance specifications enhance the possibility for design builder innovation . Reviewed and confirmed 10-17-2012

Post-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Additional Cost to Respond	Date Post Last Updated
20%						$0.00	
Cost ($M)	-$50.00	-$25.00	-$10.00	-$0.89	-$6.23	Strategy	
Schedule (Mo)	0.00	0.00	0.00		0.00		

Monitoring and Control

Risk Owner	Risk Aging	From	12/13/2012	Status Interval
Green, Frank		To	12/19/2014	Quarterly

Review Comments

02/21/2013 - SCC code updated per Marc Guichard review
10-17-2012 reviewed and confirmed F. Green / L. Peterson

Last Review	Date MC Last Updated
10/17/2012	2/21/2013

Affected Projects

"RC", "MC", "WAN"

Next Review	Risk Assignment
12/19/2012	Owner

RC.RC.CTR.20.02 | Performance specifications enhance possible design builder innovation

5.5 Construction Process Risks

Construction Process risks include risks that are due to the inevitable variability of the project's environment—including such items as unusual weather, unexpected subsurface conditions, and unexpected construction contractor failure—as well as performance risk that is manageable by the Grantee and its consultants and contractors—for example uncertainty surrounding mobilization and planned production rates. This is an area of ongoing examination and consideration on the CRC project. There are 18 active construction risks. Three of the more significant construction risks, identified for the CRC project, are listed below in Table 5-5.

Table 5-5. Construction Process Risks

RC.RC.CTR.10.02	Local partners not agreeing on access restrictions
RC.RC.CTR.900.07	Differing site conditions for foundations
RC.RC.CTR.90.1	Interfaces with other projects could lead to contractor conflicts

5.6 Project Tracking Risks

Project Tracking risks relate to the tracking and forecasting of cost and schedule outcomes. This area of risk on the CRC project is includes *Cost Estimating and Forecasting,* and *Schedule Management* risks. There are 9 active risks of this type currently identified for the CRC project There are 18 active construction risks. Two of the more significant project tracking risks are listed below in Table 5-6.

Table 5-6. Project Tracking Risks (Cost Estimating/Schedule Management)

RC.RC.CTR.10.02	Local partners not agreeing on access restrictions
RC.RC.CTR.900.07	Differing site conditions for foundations
RC.RC.CTR.90.1	Interfaces with other projects could lead to contractor conflicts

Project	River Crossing and Approaches	Risk ID	RC RC MGT 20.07
Sub-Project	RC	Status	Active

Issues with Full Funding Grant Agreement (FFGA) are not resolved in a timely manner

Risk Trigger	Change in FTA Policy	Flowchart Activity Number (s)	415
Risk Type	Both	Primary Mitigation Category	CEF
Risk Category	RQ	SCC Number	80.03
CRC Risk ID	104	Dependency & Correlation	

Pre-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Program Rank	Date Pre Last Updated
25%						67	
Cost ($M)	$0.00	$0.00	$0.00	$0.67	$0.67	Project Rank	2/21/2013
Schedule (Mo)	1.00	2.00	5.00		0.58	48	

Other than the Ctran O&M funding source risk 102. Issues with the advancement of project design would hinder FFGA. The FTA will require the design is sufficiently advanced to reduce the risk so the budget falls within the budget put forth in the financial plan. There is some requirement on the highway side for level of design. Main three issues for FTA are capacity issues, funding issues, and cost issues from design and schedule could delay the FFGA. FTA needs to receive documents that these issues are resolved. Cost is minimal.

Reviewed 10-17-2012 this risk is now requantified to incur a uniform 12 month delay if this risk occurs as if the milestone is missed have wait another year.

Post-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Additional Cost to Respond	Date Post Last Updated
25%						$0.00	
Cost ($M)	$0.00	$0.00	$0.00	$0.67	$0.67	Strategy	10/22/2012
Schedule (Mo)	1.00	2.00	5.00		0.58	Mitigate	

Maintain relationship with federal delegation identify any changes that may occur with the FTA funding process. Continue working with FTA and PMO.

Monitoring and Control

Risk Owner	Risk Aging	From	12/13/2012	Status Interval
Boyd, Nancy		To	12/19/2014	Monthly

Review Comments

02/21/2013 - SCC code updated per Marc Guichard review
10/22/2012 - per review and discussion this risk is confirmed by Doug Jones, Marc Guichard, Vicki Smith, Gary Ficek.
10/17/2012 meeting with Nance B, Ray M, Frank G, and Laura P - this risk revised back to earlier quanitfication of 1 to 5 months with 2 months most likely. The issue of a significant delay to the project is being considered and will be run as a separate scenario.
10-17-2012 quantification was corrected to reflect a one year delay if this risk occurs. W King, D Jones et al

Last Review	Date MC Last Updated
10/17/2012	2/21/2013

Affected Projects

"RC", "MC", "PR", "TS", "RCD"

Next Review	Risk Assignment
11/21/2012	Owner

RC.RC.MGT.20.07	Issues with Full Funding Grant Agreement not resolved in timely manner.

Project	River Crossing and Approaches	Risk ID	RC RC MGT 20.66
Sub-Project	RC	Status	Active

Issues with Intergovernmental Agreements required for FFGA

Risk Trigger	Difficult negotiations; unexecuted agreements (unsigned).	Flowchart Activity Number (s)	415
Risk Type	Both	Primary Mitigation Category	PSM
Risk Category	RQ	SCC Number	80.03
CRC Risk ID		Dependency & Correlation	

Pre-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Program Rank	Date Pre Last Updated
20%						89	
Cost ($M)	$0.00	$0.00	$0.00	$0.00	$0.00	Project Rank	2/20/2013
Schedule (Mo)	1.00	2.00	12.00		0.70	60	

see Roadmap 8.1 and Roadmap 8.2 for list of agreements; Intergovernmental Agency agreements.

Post-Response Quantification

Probability	Low	Most Likely	High	Modeled EV Delay Cost	Total Expected Value Impact	Additional Cost to Respond	Date Post Last Updated
0%						$0.00	
Cost ($M)	$0.00	$0.00	$0.00	$0.00	$0.00	Strategy	2/20/2013
Schedule (Mo)	0.00	0.00	0.00		0.00	Mitigate	

pro-active communication with parties (active management by the agreements team Doyle et al)

Monitoring and Control

Risk Owner	Risk Aging	From	To	Status Interval
Palazzo, Mike		2/20/2013	5/30/2014	Weekly

Review Comments

02/20/2013 - this new risk was added by Mike Palazzo et al (Lyn Wylder) - this risk replaces RC RC MGT 20.06 (which was retired today).

Last Review	Date MC Last Updated
2/20/2013	2/20/2013

Affected Projects

"RC"

Next Review	Risk Assignment
2/27/2013	Owner

RC.RC.MGT.20.66 | Issues with Intergovernmental Agreements required for FFGA.

The CRC project maintains a register of identified risks and the probabilities and impacts associated with them; these impacts are estimated in terms of both cost and schedule. The Monte-Carlo analysis that we perform uses an integrated model that includes both schedule and cost impacts. These risks are evaluated and the top risks for cost and schedule receive the greatest attention for response actions (mitigation).

5.7 Top Active Risks Cost and Schedule

The following page provides information on the top active risks.

A current risk register of all risks is provided in the appendices of this document.

Table 5-7. Top Active Cost Risks

Top Risks Impacting Cost

Risk		Cost ($M)	Schedule (MO)	Risk Owner
1. RC RC ROW 20.02 *ROW cost inflation rate increases.*	*Pre-Response Expected Value*	$17.100	0.00	Palazzo, Mike
	Post-Response Expected Value	$0.000	0.00	
2. RC RC CNS 900.01 *Construction Group Minor Aggregate*	*Pre-Response Expected Value*	$15.087	0.00	Liles, Casey
	Post-Response Expected Value	$15.087	0.00	
3. RC RC CTR 40.02 *Steel prices are considerable different than anticipated*	*Pre-Response Expected Value*	$14.956	0.00	Green, Frank
	Post-Response Expected Value	$14.956	0.00	
4. RC RC ENV 10.02 *Large project changes post-ROD trigger a supplemental NEPA*	*Pre-Response Expected Value*	$14.321	2.85	Wills, Heather
	Post-Response Expected Value	$14.096	1.90	
5. RC RC ROW 50.08 *More parcels than projected go into condemnation proceedings.*	*Pre-Response Expected Value*	$13.833	0.00	Palazzo, Mike
	Post-Response Expected Value	$11.399	0.00	
6. RC RC MGT 20.01 *Delayed Project Decision Making*	*Pre-Response Expected Value*	$11.543	2.38	Boyd, Nancy
	Post-Response Expected Value	$11.543	0.79	
7. RC RC CTR 10.02 *Project is redesigned to accommodate new staging/phasing.*	*Pre-Response Expected Value*	$9.780	2.00	Niemi, Mike
	Post-Response Expected Value	$8.980	0.20	
8. RC RC ENV 30.04 *USACE 408 navigation channel authorization may require additional design information on the main river crossing and/or harbor bridges than currently available*	*Pre-Response Expected Value*	$9.620	1.30	Wills, Heather
	Post-Response Expected Value	$9.620	0.40	
9. RC RC STG 10.02 *There is an increase to the aesthetic costs/context sensitive solutions for Columbia River Bridge, both structural and non-structural caused by stakeholder*	*Pre-Response Expected Value*	$9.239	0.00	Green, Frank
	Post-Response Expected Value	$9.239	0.00	
10. RC RC STG 10.06 *River Crossing structure type changes through Alternative Technical Concept process*	*Pre-Response Expected Value*	($8.629)	0.00	Niemi, Mike
	Post-Response Expected Value	($8.629)	0.00	

Table 5-8. Top Active Schedule Risks

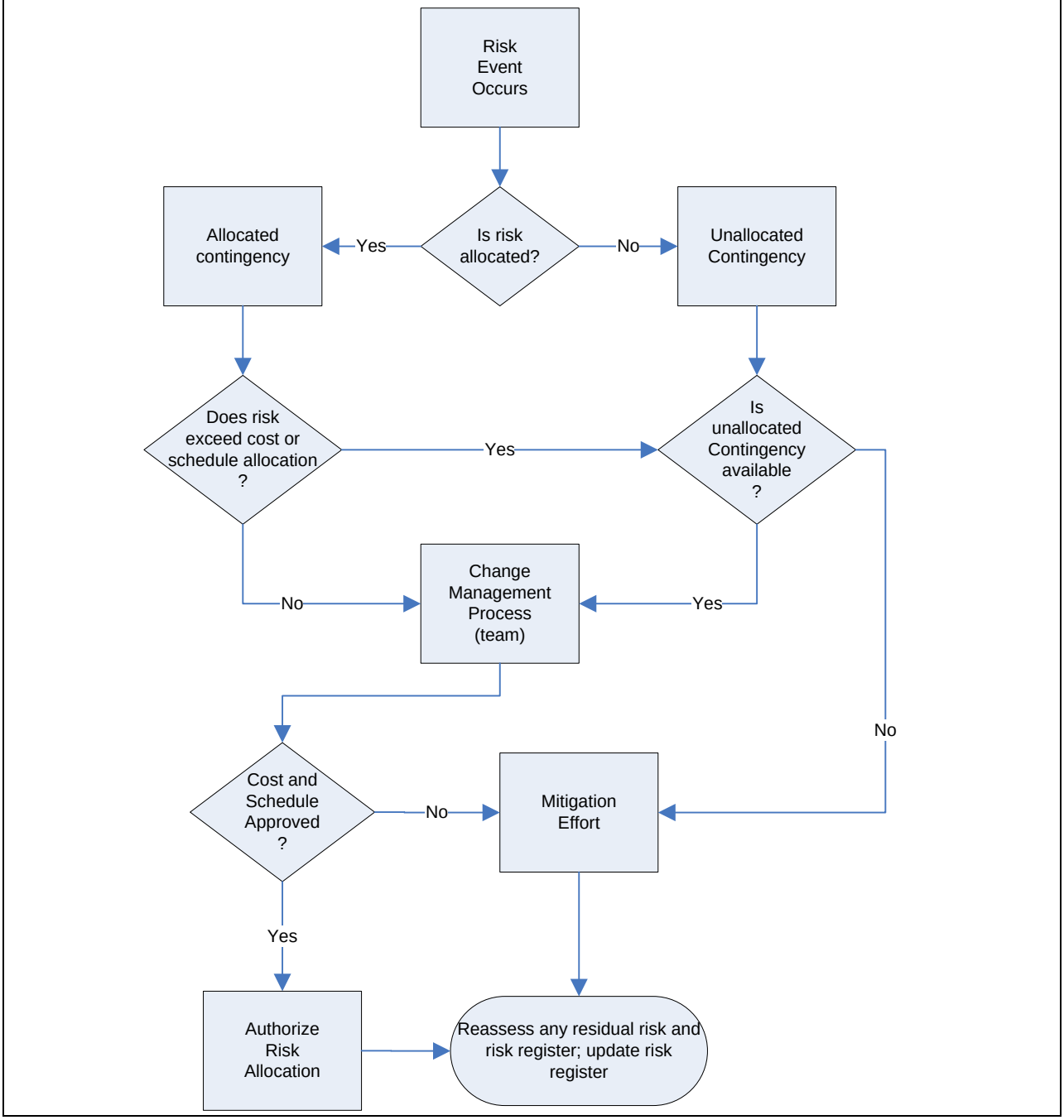
Top Risks Impacting Schedule

Risk		Cost ($M)	Schedule (MO)	Risk Owner
1. RC RC ENV 10.02	Pre-Response Expected Value	$14.321	2.85	Wills, Heather
Large project changes post-ROD trigger a supplemental NEPA	Post-Response Expected Value	$14.096	1.90	
2. RC RC MGT 20.01	Pre-Response Expected Value	$11.543	2.38	Boyd, Nancy
Delayed Project Decision Making	Post-Response Expected Value	$11.543	0.79	
3. RC RC ROW 60.04	Pre-Response Expected Value	$2.401	2.25	Palazzo, Mike
Design revision require additional property rights	Post-Response Expected Value	$2.401	2.25	
4. RC RC CTR 10.02	Pre-Response Expected Value	$9.780	2.00	Niemi, Mike
Project is redesigned to accommodate new staging/phasing.	Post-Response Expected Value	$8.980	0.20	
5. MC MC STG 10.04	Pre-Response Expected Value	$1.922	2.00	Wills, Heather
Late changes caused by stakeholder comments, City of Portland Design Review, and discoveries during final design.	Post-Response Expected Value	$1.922	0.80	
6. MC MC DES 10.02	Pre-Response Expected Value	$1.765	1.88	Liles, Casey
A realignment of Expo South Access is required	Post-Response Expected Value	$1.765	1.88	
7. RC RC MGT 30.03	Pre-Response Expected Value	$2.239	1.55	Boyd, Nancy
FTA rejecting toll revenues as a budgeted funding source	Post-Response Expected Value	$2.239	0.52	
8. RC RC ENV 30.04	Pre-Response Expected Value	$9.620	1.30	Wills, Heather
USACE 408 navigation channel authorization may require additional design information on the main river crossing and/or harbor bridges than currently available	Post-Response Expected Value	$9.620	0.40	
9. RC RC ROW 900.01	Pre-Response Expected Value	$0.633	1.13	Palazzo, Mike
Agreement issues between FHWA and FTA on shared parcels	Post-Response Expected Value	$0.633	1.13	
10. RC RC ROW 60.02	Pre-Response Expected Value	$0.474	1.13	Palazzo, Mike
Late discovery of the need to acquire additonal property due to ground improvements on Hayden Island and Marine Drive	Post-Response Expected Value	$0.474	1.13	

6. Contingency Management

Figure 6-1 provides a flowchart of the contingency management process for CRC.

Figure 6-1. Risk Contingency Management



This chapter describes how CRC contingency reserves are established for both cost and schedule. The mechanism established to draw down, or reduce, the contingency reserve as risks expire, and the process adopted to transfer funds from the contingency reserve to the baseline cost estimate should risks materialize or funds are committed to mitigate risks.

Costs will be managed to the escalated (or year-of-expenditure) *base cost estimate* prior to contract award. After contract award, costs will be managed to the amount of the successful bid.

Currently, CRC has identified contingency draw-down at the program level. As the project progresses and specific contract packages are defined contingency draw-down curves for specific project contract packages can be established.

6.1 Establishing Cost Contingency

The Columbia River Crossing program currently has two contingency pools which are funded under separate Work Identification Numbers (WINs). One contingency WIN is for the Transit Contingency and is to be shared by the associated Transit contracts in the project. The other contingency WIN is for all other portions of the CRC program and is to be shared by the associated projects that comprise this work.

Cost contingency is reported as a dollar value and as a percentage of the escalated base cost described under “Definitions” in the preamble to this plan. When construction contracts are awarded, the *base cost estimate* is replaced by the successful bid. Schedule contingency is reported in days.

The total contingency, for each contingency pool, is comprised of two parts. One is the allocated contingency, which will be allocated to risks that were identified and listed in the risk register, (risk and uncertainty that is integral to the Grantee’s CEVP). The other is unallocated contingency which represents unknown risks.

Allocated contingency is a measure of known risks on both budget and schedule, as identified in the risk register. Risk and uncertainty is initially developed by the CRC team, and further expanded and validated through the CEVP. Each risk is associated with an item on the project schedule and, as such, has a date at which it becomes active and a date after which it becomes inactive and can be retired.

The allocated contingency is the difference between the escalated base cost or base schedule and the total project cost or risk-loaded schedule, respectively, with a specified percentage likelihood of occurrence based on the CEVP modeling output. Appropriate contingency levels are established per the guidance provided by WSDOT and the FTA.

At this stage of development, a single risk or allocated contingency reserve fund will be shared by all components of the CRC program. When specific projects (that is, construction packages) are identified, each will be assigned its own fund based on risks associated with that project

Unallocated contingency is a measure of unforeseen events which, should they occur, would have an effect on budget or schedule. These are unknown events and cannot be managed until known.

The unallocated budget contingency is the difference between the allocated contingency and the total cost contingency levels based on the percentages shown in Table 6-1 for the different phases of program or project development. These are considered to be the minimum desirable levels and may need to be increased at specific milestones depending on the results of the FTA Risk Assessments performed by the PMOC. The unallocated schedule contingency may be set as a percentage of the allocated contingency.

Allocated contingency, by standard practice with WSDOT CEVP analysis is typically established using the 60th percentile figure; however, this can be adjusted as project conditions and management judgment warrants. Unallocated contingency may be added to reach the appropriate recommended minimum contingency from the Federal Transit Authority (FTA) for the project phase (level of development).

Table 6-1. CRC Contingency Drawdown Levels (Pre-construction and Construction)

	Project Phase	[1]Recommended Minimum Contingency
Pre-construction	Engineering (formerly known as entry to Final Design)	20%
	Full Funding Grant Agreement	15%
	90% to 100% Bid	10%
Construction	50% Construction	5%
	75% Construction	4%
	90% Construction	3%
	Revenue Operating Date	1% to 3%

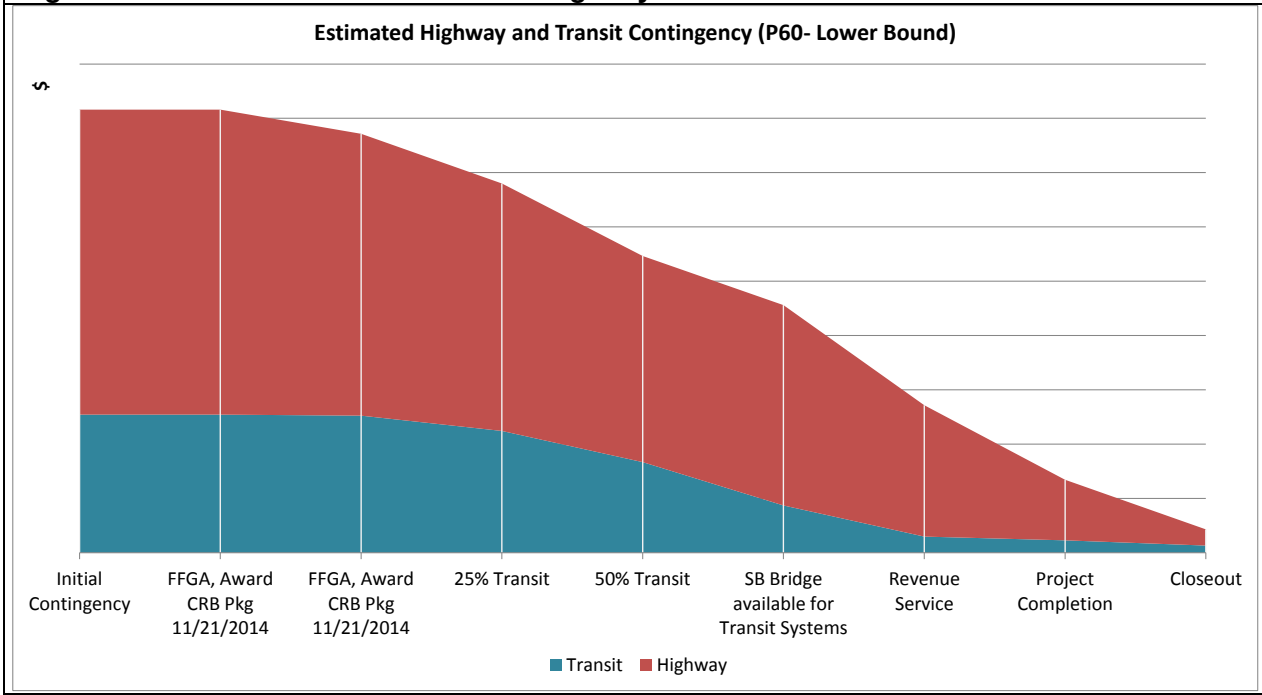
[1]Source: FTA Oversight Procedure 40 – Risk and Contingency Reserve Section 6.5.4.1 page 14 of 17; Note the source document does not provide a recommended minimum contingency for 75% Construction and 90% construction hence these are included as additional hold points for informational purposes.

Contingencies for cost and schedule will be drawn down over the design and construction of the CRC program as risk events pass, and curves will be developed showing how those contingencies are drawn down at specific to-be-determined milestones. The curves will be updated as necessary, typically at each milestone as a minimum.

The risk or allocated contingency to which the project would be exposed at each milestone will be informed by risk workshops (WSDOT CEVP workshops or FTA Risk Assessment workshops). The risk register developed for the CRC project considers the complexity and location of the project. The following contingency levels are suitable for the CRC project, based on the blended experience of WSDOT and ODOT, an examination of the FTA minimum contingency levels, and research reviews.

The contingency drawdown provided in Figure 6-2, on the following page, establishes the contingency drawdown targets for the CRC project; these curves take into account the unique nature of the project and its blend of transit and highway components. As the project progresses and definition of contract packages emerge more detailed updates will be available.

Figure 6-2. CRC Estimated Cost Contingency Draw Down Curves4



Transit	20.1%	20.1%	19.9%	17.7%	13.2%	6.9%	2.3%	1.8%	1.0%
Hwy	20.1%	20.1%	18.5%	16.3%	13.6%	13.2%	8.6%	4.0%	1.1%
Total	20.1%	20.1%	19.0%	16.7%	13.4%	11.2%	6.7%	3.3%	1.1%

1									
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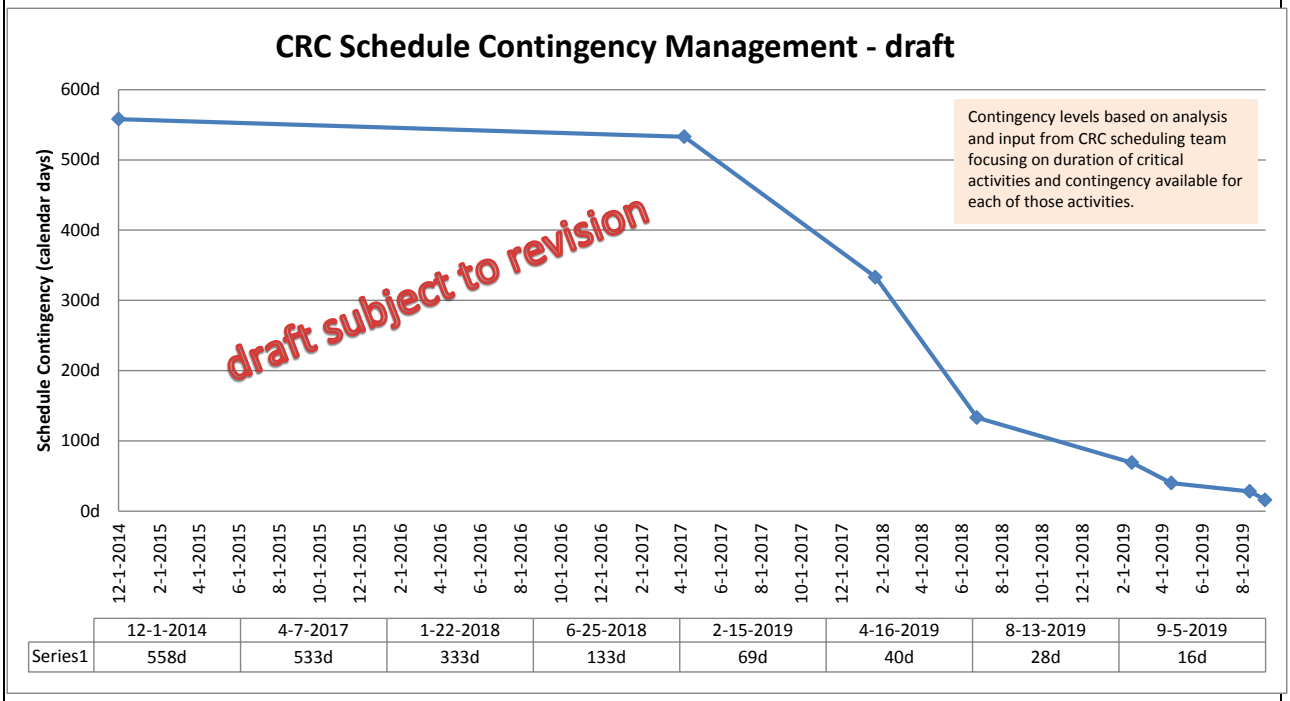
[4]Contingency percentages estimated using the risk profile from CEVP. Per FTA practices the contingency is measured from the estimated Lower Bound figure (P5 used as Lower Bound). Dollar values apply to the 2011 cost estimate for elements comprising the Initial Construction Package (ICP) escalated from Q1-2011 to Q1-2012 dollars using a global inflation rate of 2.8 percent. Hold point values were approximated using Highway and Transit Contingency ratios (P60-P5) as provided by HDR, 2012. Estimated cost allocation is 31% Transit and 69% highway.

The status of the top active cost and schedule risks are summarized in chapter 5; a complete risk register is provided in the appendices of this document

6.2 Schedule Contingency Management

Schedule contingency is identified time to allow for the potential of schedule disruptions or delays. Potential delays are benefit identified as risks in the risk register. Schedule contingency is identified at key milestones, sometimes referred to as "hold points". If contingency is not sufficient, even after primary mitigation actions have been implemented, consideration will have to be given to additional actions. The targeted amount of schedule contingency, for the project as a whole, is 20% of the time from final design to the start of revenue operations. Figure 6.3 depicts a draft estimate of contingency as of 12/3/2012.

Figure 6-3. CRC Estimated Schedule Contingency Draw Down Curves



	12-1-2014	4-7-2017	1-22-2018	6-25-2018	2-15-2019	4-16-2019	8-13-2019	9-5-2019
Series1	558d	533d	333d	133d	69d	40d	28d	16d

NOTE: As with cost there are uncertainties and risks associated with schedule. The ability to cope with schedule variations and potential risks is important for project management. To that end project schedule contingency and management is being addressed and will be presented in a future schedule update.

Schedule Contingency

The project will maintain an estimated schedule contingency of approximately of 20% of the duration of the project from Entry into Final Design (FD) through Revenue Operations. Status of the schedule, and associated contingency will be reviewed as part of the risk management process. The recommended schedule contingency amount was developed through consideration of project conditions. The project will guard against premature use of significant amounts of schedule contingency by regularly reviewing contingency levels at key hold points.

6.3 Managing Contingency Reserves

It is anticipated that the majority of risk items, including right-of-way and construction, will be identified and quantified during the design phases of the project. It is expected that most design risks will be retired by the time that construction contracts are awarded. The Configuration Change Management program will be used to associate the use of the contingency to a specific risk, and funds shall be moved into the contracts as needed to mitigate for risks that come to be realized.

Established reserves, for both cost and schedule impacts of risk events, are intended to provide a guard against schedule delay and a source of funds to cover the impact of risk events that occur and for new risks identified by the CRC team. The cost and schedule contingency reserves will be reassessed in conjunction with each CEVP or Risk Assessment workshop as a minimum and more frequently should the need arise; for example, should there be a significant change in project scope, risk profile, or other changes.

A number of events could take place that would affect the allocated and/or unallocated contingency reserves such as:

- New key risk(s) are identified.
- Implementing risk response or risk mitigation strategies.
- The aging of a risk trigger.

Following is a description of the processes that will be followed for each event listed above. The processes are intended to provide mechanisms for formal approval of the movement of funds between unallocated and allocated contingencies, of funds between allocated contingencies and base cost, and for acceptance of the schedule impacts of that event. They also provide documentation to support any decision to move such funds. In general, adjustments to the base cost and schedule for risks that materialize or for risk response strategies will be made when such adjustments are approved. Adjustments to the allocated and unallocated contingencies will be made following established change management procedures as outlined in Section 3 of the Project Management Plan for the CRC program.

Summary of Risk contingency Management

1. Establish separate “Reserve WINs” of specifically allocated reserve for each contract and manage through the CRC Change Control process.

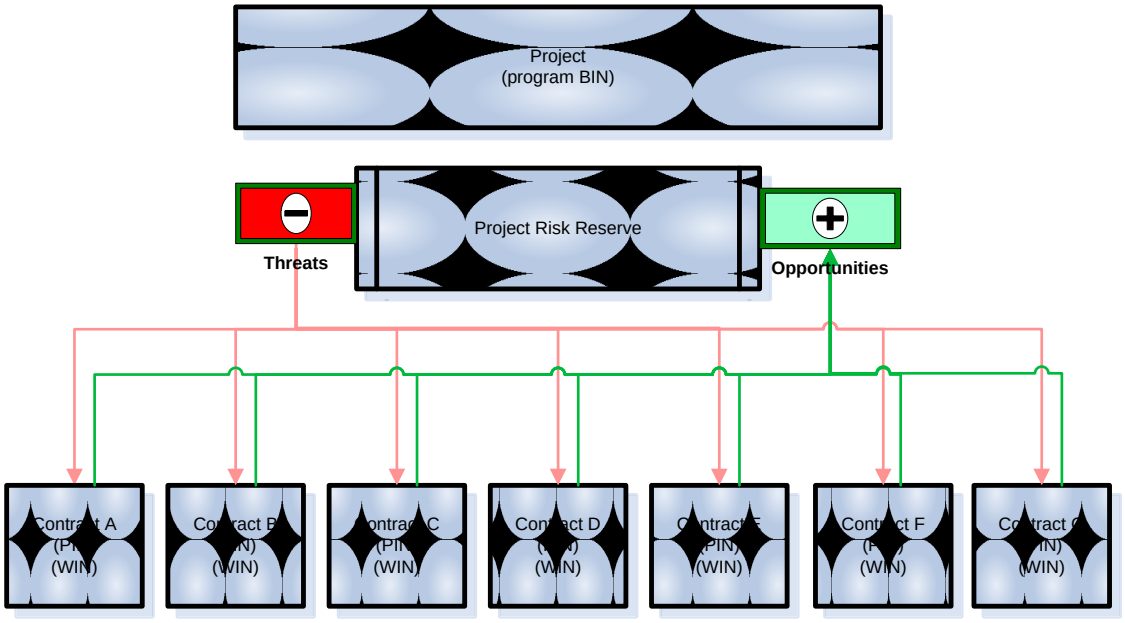
2. Establish a separate “Reserve WIN” for the overall proposed CRC project consisting of General Reserve.

3. Review to determine if applicable to Risk Register items in the “Specifically Allocated” list.

4. Reserve will be moved from the Reserve WIN to the given contract based on review and approval notices by the CRC Change Control.

5. Approved Notices not concerning Specifically Allocated Risk Register items will be funded from CRC General Reserve (unallocated contingency).

6. The CRC Cost Engineering section will track consumption of reserve.



7. Secondary Mitigation

CRC Secondary Mitigation consists of pre-planned strategies to mitigate potential scope or process changes that are triggered by risk events occurring. Examples of potential issues related to CRC include: Environmental factors including artifact discovery, geotechnical concerns, and bidding environment for construction contracts.

7.1 Recovery Plans

A recovery plan (secondary mitigation) if contingency levels drop below the FTA minimum will be developed. The CRC project management will develop and approve a mitigation list of elements that may be deleted or deferred if necessary. Once this is accomplished it will be added to the next update of this RCMP.

DETAIL TO BE ADDED

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8. Risk Management and Risk Mitigation

8.1 Assessing Project Cost and Schedule Risk

Ongoing and pro-active risk management involves adding new significant risks as they are identified and insuring they will be assigned a risk owner.

Opportunity risks: the risk owner, working with the project team, will develop a proposed strategy to maximize the likelihood and/or beneficial impacts of the opportunity. If the strategy is approved by the Executive Management Team through the established change management process, the Risk Owner will make the necessary revisions and re-submit for entry into the project plan through the Business Service Manager, the base cost will be adjusted to include the cost of the response strategy, the schedule will be adjusted if necessary, and the risk will be added to the risk database.

Threat risks: the risk owner, working with the project team, will develop a proposed strategy to minimize the likelihood and/or impacts of the threat. If the strategy is approved by the Executive Management Team through the established change management process, the Risk Owner will make the necessary revisions and re-submit for entry into the project plan through the Business Service Manager, the base cost will be adjusted to include the cost of the response strategy, the schedule will be adjusted if necessary, and the risk will be added to the risk database. Residual risk, if significant, will be added to the risk database.

The contingency reserves for budget and schedule will be adjusted after results are available for the first CEVP performed after the new risk or risks have been added to the database.

8.2 Developing risk handling options Strategies Adopted

As stated in the paragraphs above, the cost of approved response or mitigation strategies will be added to the base cost, the schedule will be adjusted if necessary, and the risk database will be revised to reflect the residual risk. Contingency reserves for budget and schedule will be adjusted ***after*** results are available from the next CEVP workshop.

8.3 Developing Secondary Mitigation Plans

The process of recognizing and incorporating the impact of a risk event occurring is initiated when the Risk Owner submits a notice identifying such to the project management. When a risk materializes, the base cost and/or schedule is revised following discussion and review by the project manager, Risk Manager, and appropriate specialty review by discipline for the risk. The project team will follow established change management processes and look for strategies to offset the impact of the change, such as reducing scope, and if necessary and appropriate, budget and schedule adjustments will be made.

8.4 Monitoring Risks

As we continue through project development the project risk profile will change. Typically as we successfully respond to risks and our project knowledge increases our risk exposure will diminish. In effect we can retire risk reserve as risk events are successfully avoided or mitigated or we have passed the time during which the risk is active and it becomes retired.

After we have implemented response actions, we must track and record their effectiveness and any changes to the project risk profile. Did the response actions have a positive or negative effect on achieving project objectives? If so explain how and why in the risk management plan.

8.5 Documenting and Reporting

The risk drawdown curves will be reviewed and updated at appropriate intervals. Tracking the use of the risk reserves, and reporting on contingency management on a program-wide basis will be performed regularly. Project Risk Leads will be responsible for tracking the use of allocated contingency reserves and identifying risk mitigation strategies at a project level and ensuring program procedures are followed when requesting the transfer of funds from the risk reserve to base cost estimate.

The documentation required for approval to retire risks or to transfer funds from the contingency fund to the base cost estimate will be logged with Document Controls.

Progress and updates will be provided in the Monthly and Quarterly Reports and/or on an as-required basis.

8.5.1 Retiring Risks

The unmitigated risk or the residual risk does not materialize and the trigger for that risk has passed, the risk is simply retired and noted as such in the database. The effect of this will not be incorporated into the contingency reserves until the next CEVP.

Funds can only be moved and schedule impacts accepted upon approval from the Risk Manager up to pre-determined thresholds or by a Contingency Management Committee (CMC) if the thresholds are exceeded. The committee will comprise a representative each from the grantee (WSDOT) and each sub recipient (ODOT, TriMet and C-TRAN).

9. Definitions

Complete glossary posted at: http://www.wsdot.wa.gov/publications/fulltext/CEVP/Glossary.pdf

Contingency A *contingency* is an amount established as a reserve against known or anticipated risk events and unforeseen or unknown events that might occur during program development and execution. The total contingency comprises two parts: allocated contingency and unallocated contingency, see Section 6.1 of this document.

Allocated contingency A measure of known risks on both budget and schedule. As described elsewhere in this plan, risk and uncertainty are initially developed by the CRC team, and further expanded and validated through the CEVP. Each risk is associated with an item on the project schedule and, as such, has a date at which it becomes active and a date after which it becomes inactive and can be retired. The allocated contingency is the difference between the escalated base cost or base schedule and the total project cost or risk-loaded schedule.

Unallocated contingency A measure of unanticipated events which, should they occur, would have an effect on budget and/or schedule. These are unknown events and cannot be managed until known. The unallocated budget contingency is the difference between the allocated contingency and the total cost contingency; Federal Transit Authority (FTA) contingency levels are based on the percentages shown in the table:

Project Phase	Recommended Minimum Contingency
Full Funding Grant Agreement (FFGA)	15%
100% Bid	10%
50% Construction	8%
75% Construction	6%
90% Construction	4%
Revenue Operating Date	3%

CEVP® Cost Estimate Validation Process – An intense workshop where transportation projects are examined by a team of top engineers and risk managers from local and national private firms and public agencies who review project details with WSDOT engineers. Many of the participants have had extensive first-hand experience with large programming and delivery. The CEVP workshop team uses systematic project review and risk assessment methods to evaluate the quality of the information at

hand, and to identify and describe cost and schedule risks. Importantly, the process examines how risks can be lowered and vulnerabilities cut, managed or reduced.

Federal Transit Authority (FTA) Risk Assessment

A risk assessment process coordinated by the FTA to evaluate project scope, cost estimate, schedule and risks of the project.

Reserves

Funds established for risk and uncertainty, and unknown contingencies. During construction, actual accounts will be set up and funds reserved.

Risk*

The effect of uncertainty on objectives.

Source: ISO 31000, ISO/IEC Guide 73:2009 – Vocabulary for Risk Management

Specific Risk Categories**

Technical Capacity risks are risks that affect project delivery as a result of available resources, and strategies to address these risks. Can include workforce and management limitations as well as staff turnover. *Technical Capacity Risks and Mitigations*.

In addition to Technical Capacity risks four categories of risk which may present a threat or an opportunity, have been adopted for the CRC project:

- *Requirements Risk* relates to the establishment and variability of fundamental goals and conditions of a project to which the design must respond, as well as the activities of the Grantee to actively identify these goals and conditions.
- *Design Risk* is associated with the performance and variability of design-related activities occurring after Alternatives Analysis.
- *Market Risk* is related to the procurement of construction services, materials, and equipment, and the variability associated therewith.
- *Construction risk* includes both risks that are due to the inevitable variability of the project's environment—including such items as unusual weather, unexpected subsurface conditions, and unexpected construction contractor failure—as well as performance risk that is manageable by the Grantee and its consultants and contractors

Source: Federal Transit Administration Oversight Procedures 40 Risk and Contingency Review

**Risk can be positive or negative, an event that presents a potential positive impact to project objectives is an opportunity; an event that poses a negative impact to project objectives is a threat.*

***In addition to these general categories detailed identifiers and risk breakdown structures as well as standard cost categories are used and described in much more detail later in this document.*

APPENDICES

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APPENDIX A

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RISK SUMMARY

RISK ID	PRIMARY PROJECT	STATUS	SCC	CATEGORY	RBS	RISK EVENT	DESCRIPTION	TRIGGER	RISK OWNER		ESTIMATED PRE-RESPONSE IMPACT			RESPONSE	
									PRIMARY	SECONDARY	LIKELIHOOD	COST	SCHEDULE	STRATEGY	ACTION
001	Hayden Island-Mainland Connector	Active	60.01	Design	ROW 10	Opportunity to not acquire Ross Island Sand and Gravel	Full acquisition is in the base cost estimate. Opportunity to get deviation through IAMP to provide access without this property so might not have to acquire. Before we enter the final design phase and begin the right of way phase, it should be fairly certain if the acquisition will be a total take. This is a parcel with a greater than $5 million dollar impact.	IAMP	Joe Gray	Mike Palazzo	30%	-$12.0 million	0.0 mths	Mitigate	Opportunity to be resolved with IAMP. Before we enter the final design phase and begin the right of way phase, it should be fairly certain if the acquisition will be a total take.
002	Columbia River Bridges	Active	90	Requirements	PSP 20	Delay to ODOT/WSDOT agreement for tolling	This pertains to O&M (tolling). Only the funding and construction agreements are in place. There is a chance that there will be challenges getting agreement on finance plan, particular tolling finance and governance. Could affect FTA FFGA application. Risk is considered to be minor (i.e. very low probability).	FFGA Application	Mike Williams	Steve Siegel	0%	$0.0 million	0.0 mths	Avoid	Develop term sheets through early discussions between ODOT & WSDOT. Capitalize on existing bi-state agreements between WSDOT and ODOT.
003	Columbia River Bridges	Active	80.02	Design	RR 10	Railroad agreement term sheets take longer than assumed	This could delay construction. Delay in getting railroad term sheets delays entry into FTA final design - need term sheet by the end of 2011. Railroad may require their own flaggers during construction and will need to approve encroachment onto their right of way for construction. Impacts SR 14 and transit north approach.	Construction	Laura Peterson	Devin Reck	35%	$0.0 million	1.5 mths	Avoid	Early discussions happening with BNSF to reduce the risk of delay. Potential completion of agreement with BNSF before application to enter Final Design.
004	Hayden Island-Mainland Connector	Active	90	Requirements	PSP 20	Delay to agreements with the City of Portland	Agreements include: TriMet and City over arterial bridge ownership and operation; ROW agreements; O&M agreements; arterial bridge; and ODOT O&M agreements. Aesthetics agreements are excluded.	FFGA Application	Paul Heydenrych	Wesley King	20%	$0.0 million	0.5 mths	Mitigate	To be tied into operations and maintenance plans being developed with the COP. Deliverable COP/TriMet Agreement O&M.
005	Program Wide	Active	40.05	Design	PSP 30	Delays getting agreements on aesthetics with partner agencies	Partner agencies will want to be involved with hiring architects and getting feedback on aesthetic elements of project. This could affect completing development of the RFP. Cost issues with aesthetics are captured elsewhere.	DAP	Casey Liles	Devin Reck	20%	$0.0 million	0.7 mths	Mitigate	Early discussion with partner agencies and involvement in RFQ RFP process for bridge architect.
006	Columbia River Bridges	Active	40.05	Requirements	MGT 900	Cost sharing agreement for CRB is necessary to avoid shifts in cost allocation	Agreement between, CRC, FHWA, FTA need to allocate costs of bridge between the various agencies. Considered to be a minor risk.	FFGA Application	Casey Liles	Devin Reck	0%	$0.0 million	0.0 mths	Mitigate	Develop term sheets. Recognize FTA guidelines on financial match and associated milestones. Deliverable: IGA between Transit and Highway addressing the approach.

RISK ID	PRIMARY PROJECT	STATUS	SCC	CATEGORY	RBS	RISK EVENT	DESCRIPTION	TRIGGER	RISK OWNER		ESTIMATED PRE-RESPONSE IMPACT			RESPONSE	
									PRIMARY	SECONDARY	LIKELIHOOD	COST	SCHEDULE	STRATEGY	ACTION
007	TriMet Contracts	Active	30.02	Requirements	MGT 900	Milwaukee project does not proceed.	If Milwaukee project is not constructed, CRC would possibly need to take on more costs associated with Ruby Junction.	No PMLR FFGA issued	Wesley King	Vicky Smith	10%	$5.0 million	0.0 mths	Accept	Milwaukie project is moving forward however there is an adjustment in projected cost sharing. Griffiths to produce a financial plan for Ruby Junction Maintenance Facility Split with TriMet's Portland to Milwaukee.
008	Columbia River Bridges	Active	40.05	Construction	CTR 20	Consensus issues on design package for Main River Crossing DB RFP	Differences between ODOT and WSDOT specifications will be difficult to resolve. FTA also involved as transit will be on S/B bridge, and the agency may view unresolved differences as a technical capacity issue; one that could delay approvals.		Casey Liles	Devin Reck	25%	$0.0 million	1.0 mths	Accept	Develop Design Acceptance Package (Oregon). Continue coordination with between CRC, WSDOT and ODOT.
009	Program Wide	Active	90	Construction	CTR 10	Significant change in construction sequencing/phasing	Captured largely through other opportunities in this register and the base duration uncertainty for the DB contracts. Considered to be a minor risk.	Package Identification	Mike Niemi	Lynn Rust	0%	$0.0 million	0.0 mths	Accept	Based on the need for packaging and availability of funding this risk will occur.
010	Program Wide	Active	90	Construction	CNS 900	Significant construction claims	Base costs include some allowance for change orders and claims (2% of construction for DB, 4% overall for DBB). Minor additional here. Excludes differing site conditions for foundations. Considered to be a minor risk.	Proposal Review	Mike Niemi	Lynn Rust	0%	$0.0 million	0.0 mths	Mitigate	Propose timely response to claims and identify and ripple effect to other projects
011	Program Wide	Active	40.05	Construction	CNS 900	Differing site conditions for foundations	This is separate from anticipated construction claims allowance. Perhaps 2% of base deep foundation costs for the project, which is still relatively minor.	When Realized	Mike Niemi	Lynn Rust	0%	$0.0 million	0.0 mths	Mitigate	Development of Geotechnical report and program, some transference to contractor.
012	Columbia River Bridges	Active	40.05	Construction	CNS 90	River traffic accidents could lead to schedule delay and associated costs	Could include ships colliding with construction equipment or temporary structures, coffer dams, etc. Most likely minor possibility of impact to the project. Considered to be a minor risk.	Collision	Mike Niemi	Lynn Rust	0%	$0.0 million	0.0 mths	Mitigate	Supplement tug and river pilots; provide construction schedule and staging plan to barge companies. Deliverable: Conduct of Construction Plan for River Crossing.
013	Highway OR	Active	40.05	Construction	CNS 900	Rapid construction of jump span.	For example, build offline and roll in (SPMT). Minor direct cost impact. Could be a reduction in schedule for the jump span, but perhaps not for the overall duration of constructing the interchanges. Risk is considered to be minor (i.e. very low probability). Considered to be a minor risk.		Mike Niemi	Lynn Rust	0%	$0.0 million	0.0 mths	Mitigate	
014	Program Wide	Active	90	Requirements	DES 900	Significant change in project limits	Very unlikely to occur. The FEIS includes the Full Build as well as the LPA Phase I. Considered to be a minor risk.		Casey Liles	Devin Reck	0%	$0.0 million	0.0 mths	Mitigate	As design is refined continued coordination with the various disciplines (etc.) will continue to ensure that changes are reflected and captured appropriately.

RISK ID	PRIMARY PROJECT	STATUS	SCC	CATEGORY	RBS	RISK EVENT	DESCRIPTION	TRIGGER	RISK OWNER		ESTIMATED PRE-RESPONSE IMPACT			RESPONSE	
									PRIMARY	SECONDARY	LIKELIHOOD	COST	SCHEDULE	STRATEGY	ACTION
015	Transit WA	Active	90	Requirements	DES 900	Significant change in transit concept/design	Discussion of options for reducing costs of transit across the entire alignment. Unlikely for any major change in concept. Risk is considered to be minor (i.e. very low probability). Considered to be a minor risk.		Wesley King	Vicky Smith	0%	$0.0 million	0.0 mths	Mitigate	Discussion of options for reducing costs of transit across the entire alignment. A VE workshop is planned for mid-January 2012.
016	Columbia River Bridges	Active	40.05	Construction	ENV 20	New Endangered Species Act listing during construction	Species currently present in area is listed under ESA before end of construction, requires reinitiating of ESA consultation, new conservation measures.	New ESA listing	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Continue tracking ESA listing developments through agency coordination and contact. Project has already incorporated impact minimization measures that can be used if lamprey or streaked horned larks are listed.
017	Columbia River Bridges	Active	40.05	Requirements	ENV 20	New listed species shows up in the project area	Currently listed species arrives in project area before end of construction, requires reinitiating of ESA consultation, new conservation measures	New species observed	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Track listed species sightings on a regular basis. Very low risk, unless orca start following sea lions to Bonneville. Continuing the tracking of ESA listing developments through agency coordination and contact. Any listings likely will be addressed by project before the ESA listing is official.
018	Program Wide	Active	90	Construction	ENV 20	Terms and conditions of the BO and other approvals cannot be met during construction	Examples: pile driving operations cause more take than Biological Opinion called out, despite best efforts of contractor. Recent completion of the Test Pile Program has validated project team's conservative estimates for take.	Construction	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Re-initiate consultation if the terms and conditions are impossible to meet. Monitor the contractor during construction. Deliverable: Biological Opinion.
019	Program Wide	Active	40.03	Construction	ENV 50	Hazardous materials liability associated with property acquisition	Primary concern is Hayden Island and Marine Drive, unknown hazmat. The base cost estimate has some allocation for this.	Environmental Assessments	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Phase I and Phase II hazardous materials analysis.
020	Program Wide	Active	90	Requirements	ENV 10	Controversy on environmental process leads to Post-ROD NEPA challenge	Likelihood of a challenge is high, and it may result in delay. May delay ROW acquisition through injunction. The likelihood of a delay resulting from the challenge depends on the outcome from this set of potential, mutually-exclusive outcomes.	ROD	WSDOT Attorney General	Heather Wills	20%	$0.0 million	1.2 mths	Accept	The project has no control over whether the ROD is challenged. To mitigate the impact of expected challenges, ensure that due process is followed and that the process is fully documented. Ongoing coordination with NPS and other stakeholders prior to finalizing the 4 (f) documents. Nearly 100% guarantee that there will be a challenge by an interested party.
021	Program Wide	Active	90	Requirements	ENV 70	Environmental regulations change	Water quality regulations, definition of jurisdictional resources (e.g., ditches). Schedule impact larger if change occurs later.	Construction	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Track draft rules and policy changes through construction. Continued coordination with regulatory agencies.

RISK ID	PRIMARY PROJECT	STATUS	SCC	CATEGORY	RBS	RISK EVENT	DESCRIPTION	TRIGGER	RISK OWNER		ESTIMATED PRE-RESPONSE IMPACT			RESPONSE	
									PRIMARY	SECONDARY	LIKELIHOOD	COST	SCHEDULE	STRATEGY	ACTION
022	Program Wide	Active	90	Requirements	PSP 20	Interagency coordination/agreements Post-ROD	Marine Mammal Protection Act, Corps 404, Section 9 RHA (USCG), DEQ 401, Ecology 401, WA WPCA, OR Removal-Fill, WDFW HPA, ODFW Fish Passage, ODFW Habitat Mitigation, COP, COV, Other EPA.		Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Track terms and conditions of existing authorizations and like terms from authorizations still needed. Continued coordination with regulatory agencies.
023	Program Wide	Active	90	Requirements	PSP 10	Tribal consultation	Ensure that there are not fatal flaws for natural resources and cultural resources with the tribes.	ROD	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Recent interaction with CRITFC and tribes indicate issues with project; despite on-going coordination and communication. Likely a demand for additional mitigation.
024	Program Wide	Active	40.04	Construction	ENV 80	Inadvertent discovery of human remains	Risks associated with discovering human archaeological remains during excavation, demolition, construction	Construction	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Even with an inadvertent discovery plan, there is still a risk for delay. Add cost impact of $1 to $5M.
025	Program Wide	Active	90	Construction	CNS 20	Contractor not following the terms and conditions of permits	Example: IWWW needs to be extended to complete work operations. Permits include all listed in above risk.	RFP Release	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Place permits into bid packages, highlight need for compliance, and penalties for lapses. Place permits into bid packages, highlight need for compliance, and penalties for lapses.
026	Program Wide	Active	40.04	Requirements	ENV 10	Negative community impacts expected (civil rights title VI lawsuit or EJ issues)	Potential lawsuit on EJ issues; various pressures from communities	ROD	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Revise risk to a cost risk, remove 2 month delay.
027	Program Wide	Active	40.04	Construction	ENV 80	Unexpected cultural resources may be encountered	Associated with demolition and construction. Some areas cannot be easily investigated until construction begins. This risk does not include inadvertent discovery of human remains.	Construction	Heather Wills		30%	$0.5 million	0.0 mths	Mitigate	Will likely find a lot of common items on Vancouver side, which will likely not be significant and will not cause a delay. There is a chance of finding something that might cause a delay. $0.5 million cost impact at most for cataloging.
028	Program Wide	Active	40.04	Construction	ENV 80	Environmental impacts of demolition/excavation/dewatering work (underground)	Applies to on land demolition not in water. Risks associated with demolition work: contamination of soil conditions, ground water, disposal site, sediments. Level of contamination unknown.	Drilled shaft test program	Heather Wills		30%	$0.5 million	0.0 mths	Mitigate	Identify construction techniques for on land demolition as early as possible to complete any environmental work necessary. Should EPA approve CRC Focused Environmental Assessment Work Plan, risk could be reduced.

RISK ID	PRIMARY PROJECT	STATUS	SCC	CATEGORY	RBS	RISK EVENT	DESCRIPTION	TRIGGER	RISK OWNER		ESTIMATED PRE-RESPONSE IMPACT			RESPONSE	
									PRIMARY	SECONDARY	LIKELIHOOD	COST	SCHEDULE	STRATEGY	ACTION
029	Program Wide	Active	60.02	Design	ROW 50	Unknown or unresolved relocation for right of way acquisition	Property owner can delay acquisition in WA, resulting in additional costs and delays. Parcels are currently not yet into the acquisition process; haven't talked to property owners. This may be driven by design changes; likelihood of significant design changes is low. As acquisition process proceeds later acquisitions that may be delayed can have a greater impact.		Joe Gray	Mike Palazzo	0%	$0.0 million	0.0 mths	Mitigate	Lock in alignment ASAP. States can take possession and resolve $$ through appeal process.
030	Columbia River Bridges	Active	40.05	Requirements	ENV 80	Marine mammal monitoring	Monitoring requirements could further restrict construction beyond current assumptions.	LOA of MMPA	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Very low risk now, less than 10% that will need monitoring beyond what is currently planned. Project did marine mammal monitoring during test pile project. NMFS was OK with monitoring effort.
031	Columbia River Bridges	Active	40.05	Requirements	PSP 20	Delay in obtaining USCG permit/agreement	Can apply for permit as soon as have ROD. Project has been communicating with USCG, and primary interest is maintaining navigable channel. Considered to be a minor risk.	RFP	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Continue coordination with USGS. Pre-application meetings with regulatory agencies at the federal, state and local levels will be scheduled in fall 2011.
032	Program Wide	Active	90	Requirements	ENV 30	Challenge to major permit (e.g. a Section 404 Permit)	There is some opposition to the project with threats to sue, but not under the 404 permit specifically. Given the time in the base schedule between ROD and start of construction, there is unlikely to be a significant on schedule. Risk is considered to be minor (i.e. low probability and unlikely impact on schedule).	RFP	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Continue coordination with agencies. Pre-application meetings with all regulatory agencies will be scheduled this fall; however risk remains of a 3rd party opposing the project can interject during the permit process
033	Program Wide	Active	40.04	Requirements	ENV 60	Changes to proposed wetland, floodplain, or other mitigation requirements	Current mitigation is at a ratio of 10:1, versus lower requirements (e.g. 3:1). Minimal impact to river level from piers expected. Risk is considered to be minor (i.e. very low probability). Potential impacts to jurisdictional wetlands on property project have not been allowed to access.	Proposal Review	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Continue coordination with agencies. InterCEP concurrence point in May, 2010 was InterCEP partner's concurrence with proposed CRC compensatory mitigation.
034	Program Wide	Active	90	Requirements	PSP 900	Delays in obtaining land use permits	It is anticipated that there is sufficient time for the permitting process in the base schedule (18 months). Risk is considered minor (i.e. very low probability).	RFP Release	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Continue coordination with agencies. Pre-application meetings will be scheduled this fall with City of Portland and City of Vancouver.

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035	Columbia River Bridges	Active	40.05	Construction	ENV 20	DB contractor's plan for foundation differs from Biological Opinion	This is an ESA issue. Contractor might propose a plan for installing river foundations (e.g. cofferdams at all piers) that is different from what was approved by NMFS in its Biological Opinion. Based on industry experiences, requested changes are likely to be relatively minor and should not trigger new consultation. Risk is considered minor (i.e. very low probability).	Proposal Review	Heather Wills		0%	$0.0 million	0.0 mths	Mitigate	Dependent upon what the selected design-builder ultimately decides. If at that time, design deviates significantly, project can re-initiate consultation with NMFS.
036	Program Wide	Active	90	Requirements	MGT 30	ODOT or WSDOT funding shortfalls occur			Mike Niemi	Lynn Rust	0%	$0.0 million	0.0 mths	Avoid	
037	Columbia River Bridges	Active	40.05	Construction	ENV 80	Sole source aquifer impacted by pile driving and shafts	Possible cross contamination of aquifers to drinking water aquifers. If occurs during construction could have an impact; low probability due to not coming near or drilling deep enough to hit the aquifer	EPA Ruling	Steve Morrow		25%	$10.0 million	0.0 mths	Accept	Geotechnical investigation and analyses will determine whether more expensive methods of ground improvement will be required.
038	Columbia River Bridges	Active	40.05	Design	STG 20	Reduced cost of ground improvements at Hayden Island interchange	Proposed geotechnical investigation may result in reduced costs. Results from the numerical modeling for the Columbia River Bridge indicate that reduced ground improvements will be needed at Marine Drive. Note that this risk and Risk ID 039 are mutually exclusive.		Laura Peterson		25%	-$5.0 million	0.0 mths	Accept	Project has no control over the outcome of the geotechnical investigation beyond he interpretation of the numerical modeling results. Capture the opportunity in the base cost and change this risk to a threat.
039	Columbia River Bridges	Active	40.05	Design	STG 20	Increased cost of ground improvements at Hayden Island interchange	Potential that vibratory ground improvement methods and stone column may be disallowed either because of potential to damage adjacent property or because of environmental issues. This could result in need to go to more expensive ground improvement methods such as jet grouting. These methods could cost twice what is assumed in base. Note that this risk and Risk ID 038 are mutually exclusive.		Laura Peterson		25%	$10.0 million	0.0 mths	Accept	Project has no control over the outcome of the geotechnical investigation beyond he interpretation of the numerical modeling results. Geotechnical investigation and analyses will determine whether more expensive methods of ground improvement will be required.
040	Highway OR	Active	40.05	Design	STG 20	Reduced cost of ground improvements at Marine Drive interchange	Proposed geotechnical investigation may result in reduced costs. Results from the numerical modeling for the Columbia River Bridge indicate that reduced ground improvements will be needed at Marine Drive. Note that this risk and Risk ID 041 are mutually exclusive.		Laura Peterson		40%	-$3.0 million	0.0 mths	Accept	Project has no control over the outcome of the geotechnical investigation beyond he interpretation of the numerical modeling results. Capture the opportunity in the base cost and change this risk to a threat.

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041	Highway OR	Active	40.05	Design	STG 20	Increased cost of ground improvements at Marine Drive interchange	Potential those vibratory ground improvement methods and stone columns may be disallowed either because of potential to damage adjacent property or because of environmental issues. This could result in need to go to more expensive ground improvement methods such as jet grouting. These methods could cost twice what is assumed in base. Note that this risk and Risk ID 040 are mutually exclusive.		Laura Peterson		40%	$5.0 million	0.0 mths	Accept	Requirements may be dictated by others. For example, the Multnomah County Drainage District has already advised that stone columns will not be allowed because of potentially adverse impacts on the levee system.
042	Columbia River Bridges	Active	40.06	Design	PSP 30	Multi-use path design requires more access points than planned	Risk impact only accounts for elevators and stairs. Not yet included in the base since ADA ramps will be provided.	COV/COP Requests	Casey Liles	Devin Reck	0%	$0.0 million	0.0 mths	Mitigate	MUP access locations will be determined upon completion of the bridge type review, at that time the project will have a better understanding of the bridge designs impacts on the MUP.
043	Program Wide	Active	40.07	Design	DES 60	Planned pavement overlaying needs to be rebuilt	Vertical profile of the highway in these areas is not changing; the age of the current pavement is about 35 years old by the time construction begins; Cost per 2 miles is about 15 million above resurfacing costs; This risk is due to the condition of the pavement leading to more rebuilding than planned.		Casey Liles	Devin Reck	0%	$0.0 million	0.0 mths	Mitigate	Coordination with SW region for pavement evaluations.
044	Program Wide	Active	40.08	Construction	CNS 10	Staging issues due to local partners not agreeing on access restrictions	Project does not have related agreements with the Cities. Costs are for making unanticipated detour improvements to mitigate for various closures. For example, City of Vancouver not agreeing to the project temporarily closing access from SR 14 to City Center.	COV/COP Agreements	Casey Liles	Aaron Myton	60%	$10.0 million	0.0 mths	Mitigate	Early development and coordination with local partners and agencies. Deliverable: Early development of Traffic Mitigation Plan.
045	Highway WA	Active	40.08	Design	CTR 10	Changes in staging result in additional design costs.	Generally there's a risk of increased cost and schedule delay if the project has to be redesigned to accommodate phasing. Current design has some phasing assumed in it. Phasing risk will be triggered by funding delays. This covers the design costs (perfectly correlated to related to Risk ID 052). This is the possibility for temporary work not as assumed in the base.	Funding Delay	Casey Liles	Devin Reck	25%	$4.0 million	1.0 mths	Accept	Phasing will be in response to other financial pressures.
046	Highway OR	Active	40.06	Design	PSP 30	Pedestrian undercrossing between Delta Park and North Portland Harbor	The city has requested an extra span on east side of freeway (it would like it "wide open"). Increase bridge (WHICH BRIDGE) by an additional 80' x 100'.		Casey Liles	Devin Reck	20%	$6.5 million	0.0 mths	Accept	Phasing will be in response to other financial pressures.

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047	Highway OR	Active	60.01	Design	ROW 60	Additional ROW may be required and or change in alignment	HI Drive at Target, City not requiring enough half street for project cross-section. COP/ODOT may require full width ROW and street improvements.	COP/ODOT Requirements	Casey Liles	Devin Reck	0%	$0.0 million	0.0 mths	Avoid	There is development going in, may require widening to the north, narrow cross-section or stop improvements. Would need to acquire bank. This should not impact schedule. ROW base cost uncertainty is -20%/+10% (accounts for valuation, not number of parcels). Widen to the north (Acceptance) Stop short (Avoidance) Narrow cross-section (Mitigation).
048	Highway OR	Active	40.05	Design	DES 60	Replacement of Victory overcrossing	The base cost assumes widening. Cost impact to replace the bridge is $20 to $30 million.	ODOT Requirement	Casey Liles	Devin Reck	15%	$25.0 million	0.0 mths	Avoid	Pressure will be to keep cost low. There should be a design solution that is acceptable.
049	Program Wide	Dormant	90	Construction	CNS 40	Early construction finish	There is no indication of early finish to construction. Design build options for some packages could accelerate some construction, however delays are related to funding, political reasons, and therefore DB may not add much acceleration. Low likelihood, not quantified.	Contractor Strategies	Nancy Boyd	Kris Strickler	15%	$25.0 million	0.0 mths	Mitigate	Ongoing opportunity throughout the project to be monitored by CRC staff.
050	Program Wide	Active	40.08	Construction	CNS 10	Close staging site available	The base cost assumes widening. Cost impact to replace the bridge is $20 to $30 million.	Third Party Agreement	Casey Liles	Devin Reck	15%	$25.0 million	0.0 mths	Mitigate	Opportunities will be identified as the project progresses and undergo a thorough analysis for implementation.
051	Program Wide	Dormant	90	Construction	CTR 10	Delivery type provides flexibility and cost savings		Design-Build Decision	Casey Liles	Devin Reck	0%	$0.0 million	0.0 mths	Accept	Opportunities will be identified as the project progresses and undergo a thorough analysis for implementation. Deliverable: PMP / Project Packaging and Delivery Methods Workshop Analysis Completion.
052	Program Wide	Active	90	Construction	CTR 10	Phasing results in additional construction costs	Generally there's a risk of increased cost and schedule delay if the project has to be redesigned to accommodate phasing. Current design has some phasing assumed in it. Phasing risk will be triggered by funding delays. This covers the design costs (perfectly correlated to related to Risk ID 045). This is the possibility for temporary construction not as assumed in the base.	Funding Delays	Casey Liles	Devin Reck	25%	$35.0 million	0.0 mths	Accept	Phasing will be in response to other financial pressures.

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053	Highway OR	Dormant	40.07	Construction	DES 10	Increase in schedule/budget/cost delays to avoid LRT impacts at Victory Braid	There is a tight area to fit this structure into, and the location has poor soils and the existing LRT line adjacent. There may be a need for an expensive ground improvements, staging and access needs. There is some concern over the potential impact to the adjacent existing LRT alignment. Cost and schedule impact uncertainties are independent of one another.	Full Build Decision	Casey Liles	Devin Reck	50%	$8.0 million	1.0 mths	Mitigate	Consider performing a more detailed constructability review to satisfy concerns and then accept any changes in cost.
054	Highway OR	Dormant	40.05	Construction	CNS 900	Obstructions to 5S-500 Alignment construction	There is a possibility for this alignment to hit obstructions with the 39th Street overcrossing frank piles and a potential dump site.	Full Build Decision	Casey Liles	Devin Reck	0%	$0.0 million	0.0 mths	Mitigate	Consider doing more subsurface mapping.
055	Highway OR	Dormant	40.08	Construction	CNS 10	39th Street overcrossing remains open during construction	Base assumes 39th Street overcrossing can be closed for 12-18 months. If this cannot occur we may need a temporary bridge or to stage construction. Cost and schedule impact uncertainties are independent of one another. If decision made to implement Full Build, additional triggers include a COV agreement and staging plans.	Full Build Decision	Casey Liles	Devin Reck	90%	$3.0 million	5.4 mths	Mitigate	Project team needs to work with the City to determine acceptability of closing 39th Street during construction.
056	Highway OR	Dormant	40.05	Design	DES 20	Replace SR 500 to I-5 South structure	Base assumes 500-5S structure will not be replaced (assumes can deviate the shoulders and avoid building the bridge). There is a possibility this may be required to meet standards and accommodate auxiliary lanes. Do not combine with ROW 18.	Full Build Decision	Casey Liles	Devin Reck	30%	$20.0 million	0.0 mths	Avoid	SW Region has verbally stated that deviation of shoulders is acceptable as a measure to avoid replacement.
057	Columbia River Bridges	Active	40.04	Design	ENV 40	Packaging a historical impact and SR-14 in with bridge crossing	Risk that this package will impact transit schedule.	Full Build Decision	Casey Liles	Devin Reck	0%	$0.0 million	0.0 mths	Mitigate	No clear on what risk entails.
058	Program Wide	Active	90	Market	CTR 40	Uncertain market conditions for Design-Bid-Build contracts	Competition is high and will likely remain high the next few years. Range is higher than for Design-Build because these contracts are scheduled to be let further out. Range could be -10% to + 20% of base cost. Assume no delay impacts (captured elsewhere). Weakly correlated with other DBB contracts. Not correlated with DB contracts. Variations in steel costs are covered under Risk ID XXX.	DBB Packages	Mike Niemi	Lynn Rust	0%	$0.0 million	0.0 mths	Accept	The project has little or no control over the outcome. This risk was assigned a 100% probability in the May 2011 CEVP and, as such, should be modeled as part of the base cost uncertainty.

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059	Program Wide	Active	90	Construction	CTR 30	Bid protest	For example, WSDOT doesn't have the right RFQ process or doesn't follow its RFQ process, such as short-listing too many; claim of conflict of interest, such as from consultants; sore losers blame WSDOT. Potential delay on the order of a few weeks to a few months (Oregon – 1 month max), but unlikely to occur.	Short list or RFP award	Mike Niemi	Lynn Rust	0%	$0.0 million	0.0 mths	Accept	CRC realizes that protests are a possibility with any project, will work to follow WSDOT guidelines.
060	Program Wide	Active	90	Market	CTR 70	Limited availability of critical equipment or labor	Only valid if not included under market condition risks. Team says not likely.	Construction Market Improves	Mike Niemi	Lynn Rust	0%	$0.0 million	0.0 mths	Accept	If realized delay future projects till adequate funding is available or get more funding.
061	Program Wide	Active	90	Construction	CTR 30	Owner delays in developing and issuing Design-Build RFP	For example, from issues with joint Oregon/Washington AG review of the procurements; inadequate staffing causing delays such as in issuing RFP; or other delays from HQ. Potential delays related to reviewing RFPs covered under Risk ID 062. Sequencing currently being developed, to followed by packages and delivery plan.	Schedule Slip	Mike Niemi	Lynn Rust	50%	$0.0 million	1.5 mths	Mitigate	Confirm packaging and sequencing as well as funding timing/availability.
062	Program Wide	Active	90	Construction	CTR 30	Owner delays in awarding Design-Build contracts	For example, inadequate staffing causes delays approving Alternative Technical Concepts, or contractor design or submittals; or other delays from HQ. Potential delays related to issuing RFPs covered under Risk ID 061.	Schedule Slip	Mike Niemi	Lynn Rust	50%	$0.0 million	1.5 mths	Mitigate	Form quick response team.
063	Program Wide	Active	90	Construction	CTR 30	Owner caused design builder delays	Approval of contractor design or submittals; or other delays from Owner.	Schedule Slip	Mike Niemi	Lynn Rust	0%	$0.0 million	0.0 mths	Mitigate	Follow PMP procedures for design review and mitigation having adequate staff.
064	Program Wide	Active	90	Construction	CTR 30	Owner issues managing/delivering Design-Build procurement	For example, inadequate staffing causes delays such as in issuing RFP, approving Alternative Technical Concepts, or contractor design or submittals (i.e., design delays); or other delays from HQ. Need to make sure this does not duplicate Risk IDs 061, 062 and 063.	Issue Final RFP	Mike Niemi	Lynn Rust	50%	$0.0 million	0.5 mths	Mitigate	Form quick response team.
065	Program Wide	Active	90	Construction	CTR 60	Issues related to bidders meeting DBE goals	Bidders may have difficulty meeting program DBE goals.	Proposal Review	Mike Niemi	Lynn Rust	25%	$0.0 million	0.3 mths	Mitigate	Review with proposers as identified. If DBE goals are unattainable the proposers will notify CRC and a review will be conducted.

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066	Program Wide	Active	90	Market	CTR 40	Rebar steel costs accelerate faster than general inflation	Steel costs are very variable over time. Model as 100% chance of triangular distribution with minimum = -20%, mode = +20%, and maxim mum = +60%% ($.65/lb to $1.20/lb). This cost uncertainty is separate from base cost uncertainty, CCI inflation, and market conditions risks captured separately. Independent of market conditions risks. Moderately correlated with other steel-specific uncertainties.	Rapid Rebar Cost Increase	Mike Niemi	Lynn Rust	0%	$0.0 million	0.0 mths	Accept	Review costs at RFP release. This risk was assigned a 100% probability in the May 2011 CEVP and, as such, should be modeled as part of the base cost uncertainty.
067	Program Wide	Active	90	Market	CTR 40	Structural steel costs increase more than projected escalation	Steel costs are very variable over time. Model as a triangular distribution with minimum = -15%, mode = +0%, and maxim mum = +30% ($2.00/lb to $2.90/lb). This cost uncertainty is separate from base cost uncertainty, CCI inflation, and market conditions risks captured separately. Independent of market conditions risks. Moderately positively correlated with other steel-specific uncertainties.	RFP Release	Mike Niemi	Lynn Rust	25%	$0.0 million	0.3 mths	Accept	The project has little or no control over the outcome. This risk was assigned a 100% probability in the May 2011 CEVP and, as such, should be modeled as part of the base cost uncertainty.
068	Program Wide	Active	60.01	Market	ROW 20	Uncertainty in ROW cost inflation rate	The project team has selected the WSDOT CPMS tables to determine YOE costs, consistent with WSDOT Instructional Letter IL 4071.01. However, being deterministic, these tables ignore uncertainty in annual inflation rate. Market conditions are considered to be flat for the next couple of years.	Change in Projected Inflation	Joe Gray	Mike Palazzo	0%	$0.0 million	0.0 mths	Accept	Refine program estimates as needed or early acquisitions.
069	Program Wide	Active	60.01	Design	ROW 50	Additional Condemnation to what is in the base	WSDOT can only condemn if the property is for a highway use, or its within limited access of our hwy system. Base includes 30% allowance for condemnations. Could apply to any properties other than the Columbia River Bridge properties (which are addressed separately).		Mike Palazzo		15%	$0.0 million	0.9 mths	Mitigate	Takes that can affect the critical path should be started as soon as possible after the ROD.
070	Program Wide	Active	60.01	Design	CTR 70	Lack of appraisers	Due to the small number of qualified appraisers in the region who perform eminent domain appraisal, appraisal may take additional time. In addition there may be several other large public projects underway concurrently. May not be as severe a problem on the WA side as other state projects will be winding down before start of CRC project. More of a risk to subsequent procurements rather than initial procurements.	Multiple Regional Mega-Projects	Joe Gray	Mike Palazzo	25%	$0.0 million	1.1 mths	Accept	Hire firm temporarily with qualified appraisal resources to complete appraisal process for each ROW acquisition phase. (Analysis must be done for availability of local qualified appraisers before looking nationally (Just WSDOT)). Need to send out email statewide asap requesting appraisers to come work on project.

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071	Transit OR	Active	60.01	Design	PSP 20	Agreements or Term Sheets not in place to allow acquisition process to begin	IGA agreements are needed and they are critical. Coordination is required among the different government agencies. Early agreements among the agencies should prevent later time-delaying controversies. Risk relates to reluctance of CTRAN/COV to exercise eminent domain authority to acquire property (WSDOT may not have eminent domain rights for property not be used for highways. Only affects WA transit ROW.	FD Application	Joe Gray	Mike Palazzo	25%	$0.0 million	1.1 mths	Mitigate	It is anticipated that the establishment of the right of way (ROW) term sheet that is the outline for the ROW agreement will take place before we enter into the final design phase.
072	Program Wide	Active	60.01	Design	ROW 50	Acquisition from federal agencies	Parcels owned by these agencies, which include USA, Western Federal Lands, and National Parks, require additional time to negotiate and process the transactions. They may require a lengthy mitigation process involving functional replacement.	Finding Replacement Parcels	Mike Palazzo		10%	$0.0 million	0.3 mths	Mitigate	If disagreements occur between USA, Western Federal Lands and Parks, parcel options have already been identified and early discussions for mitigation opportunities are ongoing.
073	Program Wide	Active	40.07	Design	DES 60	Unable to mitigate parking loss or access to covered parking for Columbia Manor	If we are not able to cure circulation issues it could be a lengthy negotiation process as the owner tries to exhaust all their options. This issue is with the number of parking spots. Discrete risk with 50% probability of additional $5 million; 5% probability of additional $20 million full cost to acquire, 45% no impact.	Impact Analysis	Mike Palazzo		50%	$5.0 million	0.0 mths	Mitigate	Appraisal phase will address diminution of value for any loss of use of garage, other parking areas.
074	Transit OR	Active	60.01	Design	PSP 20	Agreement between FHWA and FTA on shared parcels	Some parcels are being acquired and portions will be used for transit and the rest for highway.	Acquisition Schedule	Joe Gray	Mike Palazzo	25%	$0.0 million	1.1 mths	Mitigate	Acquisition proposal to be submitted to the FTA, and the FHWA for review. The review should be complete before the project enters final design phase. Parcels are being identified for acquisition based on which agency will be utilizing the parcels. Agreements to follow.
075	Transit OR	Active	60.01	Design	ROW 60	Additional acquisition due to ground improvements	Risk of acquisition due to ground improvements. Additional $1.75 million cost impact for full acquisition and relocation.	Design Change	Mike Palazzo	Joe Gray	0%	$0.0 million	0.0 mths	Mitigate	Additional funds will be estimated to pay for any unforeseen costs, and contingency factor of 25% will be used for these parcels that may require ground improvements. Soil and foundation tests will be performed for the buildings that are in question.

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076	Transit OR	Active	60.01	Design	ROW 60	ROW for SR 500 to Fourth Plain Slip Ramp	Base assumption is no slip ramp. If ramp is included requires 20 additional parcels to be acquired. If a slip ramp is added to the project, 20 additional parcels would require with associated cost and schedule impacts. Schedule impact assumes decision is made early enough to not impact ROW acquisition schedule. Conditional cost and schedule impact uncertainties are independent.	COV Opposition	Mike Palazzo	Joe Gray	5%	$30.0 million	0.1 mths	Transfer	Not included in EIS, ROD expected in December. After ROD is received may still be a risk to WSDOT as a separate project but not to CRC.
077	Transit OR	Active	60.01	Design	ROW 60	Design revision require additional property rights	No significant changes in anticipated ROW requirements are expected prior to design-build. However, there is potential for late identification of required utility relocations (and, therefore, required easements or new property for relocation). Risk likely higher on Hayden Island. Could happen before or during D/B.	Design Change	Joe Gray	Mike Palazzo	50%	$0.0 million	0.8 mths	Mitigate	Finalize utility locations ASAP.
078	Transit OR	Active	60.01	Design	ROW 50	Delay getting possession and use of all necessary properties for Columbia River Bridge	Impact is delay of acquisition missed construction windows; The risk is to the core project; NOT AN OREGON RISK.		Joe Gray	Mike Palazzo	25%	$0.0 million	1.1 mths	Mitigate	As soon as the funding, ROD, and plans are nearing approval, several key R/W processes could begin. Some of these include begin interviews, prepare the relocation plan, and begin appraisals for BNSF, Thunderbird, Federal Highways, and other parcels that may take additional time to acquire. Make offers ASAP to expedite the process.
079	Transit OR	Active	40.05	Design	DES 30	Increased aesthetic costs/context sensitive solutions for CRB	Impact is delay of acquisition missed construction windows; The risk is to the core project; NOT AN OREGON RISK.	Architectural Standards	Frank Green	Laura Peterson	50%	$12.5 million	0.0 mths	Mitigate	Actively manage work of architect involved in RFP development to ensure that RFP aesthetic requirements are reasonable and cost-effective.
080	Columbia River Bridges	Active	40.05	Design	STG 20	Reduced foundation depths at the SR14 interchange (mainline bridges only)	Change from deep foundations to shallow foundations. Assumes a change in 50% of mainline approach bridge foundations from drilled shafts to spread footings.		Frank Green	Laura Peterson	30%	-$10.0 million	0.0 mths	Transfer	Due to the change to design-build at the SR14 interchange, the design builder will optimize the design within the bounds of the RFP requirements.
081	Columbia River Bridges	Active	40.05	Design	STG 30	Increased foundation sizes at the SR14 interchange (mainline bridges only)	Increasing shaft diameter to D+3. Current base estimate assumes D+2 shafts for SR14 mainline approach bridges.		Frank Green	Laura Peterson	0%	$0.0 million	0.0 mths	Transfer	Due to the change to design-build at the SR14 interchange, the design builder will optimize the design within the bounds of the RFP requirements.

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082	Columbia River Bridges	Active	40.05	Design	STG 30	Increased foundation depths at the SR14 interchange (landside bridges only)	This risk is being added to represent the potential for change in foundation sizes at the SR 14 interchange landside bridges. Current base estimate assumes shafts for 5N-14 E bridge. All other SR 14 bridges are assumed to be on spread footings. Risk assumes landside bridge foundations change from spread footings to drilled shafts.	Geotechnical Baseline Report	Frank Green	Laura Peterson	75%	$10.0 million	0.0 mths	Transfer	Due to the change to design-build at the SR14 interchange, the design builder will optimize the design within the bounds of the RFP requirements. Will include in the results of the drilled shaft and driven pile test program in the RFP to provide the design-builder an additional basis for efficient design of foundations.
083	Columbia River Bridges	Active	40.05	Design	STG 30	Reduced foundation depths at the SR14 interchange (landside bridges only)	Change from deep foundations to shallow foundations.	Geotechnical Baseline Report	Frank Green	Laura Peterson	0%	$0.0 million	0.0 mths	Transfer	Due to the change to design-build at the SR14 interchange, the design builder will optimize the design within the bounds of the RFP requirements. Will include in the results of the drilled shaft and driven pile test program in the RFP to provide the design-builder an additional basis for efficient design of foundations.
084	Program Wide	Active	40.05	Design	DES 30	Increased aesthetic costs for landside bridge and wall structures	These could include lighting, wall form liner, barrier, throw fences, noise walls, etc.	Architectural Guidelines	Frank Green	Laura Peterson	0%	$0.0 million	0.0 mths	Mitigate	Actively develop cost-effective and moderate aesthetic solutions in the layout phases of the bridges and walls. Deliverable: Architectural Guidelines
085	OR Wide	Active	40.05	Design	STG 20	Drilled shafts need to be deeper in the vicinity of Marine Drive and Hayden Island	Base costs assume depths of 150' and 130' at Marine Drive and Hayden Island interchanges, respectively. Opportunity to use piles on Hayden Island and Marine Drive. Upper end is having to use 210' deep shafts on the Oregon bridges; Most likely is to use 150' deep piles; Lower end assumes 125' deep piles.	Geotechnical Report	Frank Green	Laura Peterson	15%	$10.0 million	0.0 mths	Transfer	Due to the change to design-build at the Hayden Island and Marine Drive interchanges, the design builder will optimize the design within the bounds of the RFP requirements. Will include in the results of the drilled shaft and driven pile test program in the RFP to provide the design-builder an additional basis for efficient design of foundations.
086	Highway WA	Active	40.05	Design	STG 10	Wall type north of Fourth Plain (west side) could change	Base estimate assumes soldier pile, may need to change to secant pile.	Geotechnical Report	Frank Green	Laura Peterson	0%	$0.0 million	0.0 mths	Mitigate	Base estimate assumes soldier pile with tie back, may need to change to secant pile. Fairly low risk, already assuming secant piles in pinch point. Should not have a schedule impact.
087	Program Wide	Active	40.05	Construction	CNS 900	Conflicts with existing bridge foundations will require field modifications	Impacts of needing to move a pier during construction; redesign during construction. Planning to put foundations in existing median, near existing foundations. If as-builts are wrong, would need to move new foundation location.	Construction	Frank Green	Laura Peterson	0%	$0.0 million	0.0 mths	Mitigate	Survey the above-ground features and search construction records to minimize conflicts. Lay out bridges to avoid existing foundations where practical. Designs incorporating best understanding of existing foundation locations.

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088	Hayden Island-Mainland Connector	Active	40.05	Design	STG 10	Arterial bridge over the North Portland Harbor changes type	Base assumption is steel plate girder bridge, chance that it could change to weathering steel (small premium) or something else -- iconic (limited on the types). Potential (mutually-exclusive) outcomes: a) 30% chance of base; b) 10% chance of $45M extra; or c) 60% chance of $10M extra. No time impact (not critical to the overall activity).	COP Design Review	Frank Green	Laura Peterson	60%	$10.0 million	0.0 mths	Mitigate	Work with affected agencies to develop a common understanding of structure type implications. Deliverable: TS&L of Bridge Structure.
089	Columbia River Bridges	Active	40.04	Design	ENV 40	Seismic retrofit is required for Post Hospital	On one corner of the Post Hospital, coming 6' away with secant pile wall. Foundation of the hospital is cobbles. Construction activity near hospital could damage the foundation. Hospital is a historical structure.	COV/WSDOT IGA	Frank Green	Laura Peterson	0%	$0.0 million	0.0 mths	Avoid	Could reduce the amount of vibration by specifying means and methods to the contractor. High likelihood of doing something, with wide range of potential cost impacts. Low end to excavate around foundation and reinforce; cost impact of $200k with 75% probability. High end for drilled micro piles; $5 million with 10% probability.
090	Columbia River Bridges	Active	40.05	Design	CTR 900	Design complexities and increased bid costs for the composite truss structure	Some accounted for in the base, this is above what is accounted for in the base. Considered to be a minor risk.	Receive Proposals	Frank Green	Laura Peterson	0%	$0.0 million	0.0 mths	Accept	Design builder will address detailed design of deck truss.
091	Columbia River Bridges	Active	40.05	Design	DES 30	Additional aesthetics required for the CRB	This accounts for changes in structural elements to accommodate aesthetics. Considered to be same as Risk ID 079.	Architectural Guidelines	Frank Green	Laura Peterson	0%	$0.0 million	0.0 mths	Mitigate	Work with architectural team to understand cost/structural implications and architectural opportunities.
092	Columbia River Bridges	Active	40.05	Design	STG 20	Test shaft/pile program (on land) to reduce foundation costs	Test program would cost $5 million, may reduce bid costs.		Frank Green	Laura Peterson	30%	-$30.0 million	0.0 mths	Accept	Structure program to capture data for a variety of foundation scenarios. Deliverable: Drilled shaft test program documents.
093	Columbia River Bridges	Active	40.05	Design	STG 10	Hayden Island structures shortened by creating new fills	Potential to shorten structures by switching to fills in some areas. Possibly several hundred feet of structures could be removed. Potential $10M savings on structures side. However, this option only likely to work if lightweight fill were used. More ground improvement likely needed for this option. Height of fills required makes this option iffy. Savings likely minor as a result of all these issues.	Receive Proposals	Frank Green	Laura Peterson	0%	$0.0 million	0.0 mths	Accept	During next phase of design development, after geotechnical recommendations are received, CRC can determine whether or not savings can be realized with walls on HI vs. structures. The most cost-effective approach can be shown in the RFP.

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094	Columbia River Bridges	Active	40.05	Design	STG 10	Increase span lengths to remove a main river crossing pier	Potential savings would be offset by needing bigger foundations at piers and larger structural members for the bridge. Many geometric constraints (height of bridge increases because truss deck become deeper, grades change because of bridge height, potentially changing interchange configurations at either end) make this change unlikely to be cost-effective. Considered to be a minor risk.	Receive Proposals	Frank Green	Laura Peterson	0%	$0.0 million	0.0 mths	Accept	Don't believe this is a viable proposal. Design builder can propose ATC for review and approval if it is deemed viable in the future.
095	Columbia River Bridges	Active	40.05	Design	STG 20	Do not need to case drilled shafts to Troutdale formation	Could use oscillator and segmented casing to get casing down into Troutdale formation. Oscillator could allow casing to be removed. Would require changing test program to mob an oscillator rig, which is not currently planned... Contractor would probably need to do their own test shaft to get design values for uncased shaft. Could save 100 feet of casing per hole.	Receive Proposals	Frank Green	Laura Peterson	0%	$0.0 million	0.0 mths	Accept	Drilled shaft and driven pile test program assumes casing to Troutdale. Design builder has the ability to submit Alternative Technical Concept during RFP.
096	Columbia River Bridges	Active	40.05	Design	DES 10	Change in profile required for composite deck truss to provide navigational clearance	Profile would need to be raised 5-10' over the river, which likely would not modify length of structures and touchdown point at SR14/HI. Minor cost impact, no schedule impact.	Cross-Section Analysis	Frank Green	Laura Peterson	0%	$0.0 million	0.0 mths	Mitigate	Scope is being developed to study effect of profile raise, in preparation for RFP development.
097	Columbia River Bridges	Dormant	40.02	Design	ENV 70	Changes in the BMP selection over the multi-year design process	New technologies may decrease the cost, thus an opportunity; a threat because water quality has become more of an issue over time; Changes in the selection methodology may lead to an opportunity or risk.	Design Process	Laurie Line	Devin Reck	0%	$0.0 million	0.0 mths	Mitigate	Track draft rules and policy changes through construction. Continued coordination with regulatory agencies.
098	WA Wide	Active	40.02	Design	ENV 70	Incorporate Low Impact Development opportunities as design work progresses	Minor opportunity.	WDOE Guideline Changes	Laurie Line	Devin Reck	0%	$0.0 million	0.0 mths	Accept	Follow ecology guidelines for low impact development.
099	OR Wide	Active	40.02	Design	ENV 70	Insufficient data available on existing drainage systems on Hayden Island	Hayden Island almost entirely privately owned; have a lack of data on the existing drainage systems; Unknown if the systems are in place or maintained; May be issues with septic systems and row issues there; Correlated with other ROW risks.	As-Built Data from UMS	Laurie Line	Devin Reck	25%	$10.0 million	0.0 mths	Accept	UMS to provide as built data, potential redesign or none.
100	Highway OR	Active	40.02	Design	ENV 70	Lack of downstream conveyance capacity	Downstream conveyance has not been analyzed for pipe capacity with added flows from new pavement areas.	As-Built Data from UMS	Laurie Line	Devin Reck	25%	$10.0 million	0.0 mths	Accept	UMS to provide as built data, potential redesign or none.

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101	Highway OR	Active	40.02	Design	ENV 70	USACE does not allow use of existing pipes in levees	USACE must approve use of pipes through levees during construction. If not approved, will need two pump stations to route stormwater to the outfall.	As-Built Data from UMS	Laurie Line	Devin Reck	25%	$10.0 million	0.0 mths	Accept	Worst case scenario we may be required to pump over the top of the levee.
102	Program Wide	Active	90	Requirements	MGT 900	C-TRAN tax increase for O&M does not pass after one ballot measure	If the tax does not pass it may jeopardize the FTA approval to enter final design; There is not enough time prior to the FTA approval needed for final design to hold 2 ballot measures.	Vote Fails	Wesley King		10%	$6.0 million	0.0 mths	Avoid	Early polling by C-TRAN indicates positive support for the proposed increase. If fails, work with C-TRAN to redistrict and identify best polling opportunity. Deliverable: Successful Ballot Measure in 2011.
103	Program Wide	Active	80.02	Design	MGT 20	FTA approval to enter into Final Design delayed	Hinges on NEPA approval, agreements and finance plan.	Completion of FD Finance Plan	Wesley King	Vicky Smith	0%	$0.0 million	0.0 mths	Mitigate	Ramp up staff to complete deliverables for scheduled Final Design application and approval however, this all hinges on the NEPA process. Deliverable: Work closely with the FTA/PMOC to address issues and concerns while completing the Road Map.
104	Program Wide	Active	90	Construction	MGT 20	Full Funding Grant Agreement (FFGA) delayed	Other than the C-tran tax increase vote risk (Risk ID 102).	Change in FTA Policy	Vicky Smith	Wesley King	30%	$3.0 million	0.0 mths	Avoid	Maintain relationship with federal delegation identify any changes that may occur with the FTA funding process. Continue working with FTA and PMO.
105	Transit WA	Active	90	Construction	CNS 40	Construction days/hours are less limited than assumed in the base schedule	Base assumes limited construction time downtown Vancouver; may be opportunities if businesses want the work done faster and relax the work windows; Don't believe this is feasible as of the most recent update.	IGA	Wesley King	Ray Mabey	25%	$0.0 million	-0.5 mths	Mitigate	Early coordination with COV and business owners in downtown Vancouver to identify acceptable opportunities for reduced construction duration. Deliverable: IGA.
106	Transit WA	Active	50.05	Design	DES 900	Changes in technologies (esp. communications and signaling)	Issues with compatibility of systems between Oregon and Washington; testing delay would be minor: Power supply -- two different utility providers; Communication systems between C-Tran and TriMet; Integration with C-Tran BRT.	Utilities Agreements	Wesley King	Vicky Smith	50%	$1.0 million	0.0 mths	Mitigate	Ongoing coordination with C-TRAN and TriMet communications and specifications for transit alignment. New technologies will be evaluated based on compatibilities and benefits. All signal and comm. infrastructure will be provided by the same contract at the same time. There should be no difference between the two. All will need to be compatible with the existing TM and C-TRAN infrastructures.

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107	Transit WA	Active	90	Requirements	PSP 20	C-TRAN Review Panel for HCT	Work with C-Tran to discuss what aspects of the LRT the HCT panel will review. LRT might be covered by last project review panel. Considered to be a minor risk.	C-TRAN LPA Adoption	Wesley King		0%	$0.0 million	0.0 mths	Mitigate	Work closely with C-TRAN to help develop the process and see if the elements from CRC review panels will be beneficial in the HCT panel. Deliverable: C-TRAN HCT Review and Approval of proposed projects.
108	Transit WA	Active	90	Requirements	PSP 20	City of Vancouver Design Approval Processes	City of Vancouver design review for P&R and anything required at the stations.	Early Design Application	Wesley King	Ray Mabey	25%	$1.5 million	0.0 mths	Mitigate	Work closely with the COV to develop an agreement to streamline the COV design process. Deliverable: MOU with COV.
109	Transit WA	Active	40.07	Design	PSP 20	Parking Mitigation	City has policy to pay for every parking space that is removed if it cannot be relocated within 750 feet. Cost of $20,000 per spot.	FFGA Application	Wesley King	Casey Liles	20%	$2.3 million	0.0 mths	Mitigate	Work with COV and C-TRAN to develop a Parking Mitigation and Management Plan. Deliverable: Tied to MOU and Parking Management/Mitigation Plan.
110	Transit WA	Active	50.02	Design	DES 60	Crossing Gates	Included in base costs but a decision has yet to be made at the touchdown with 5th St. Minor risk.	PE	Wesley King	Casey Liles	0%	$0.0 million	0.0 mths	Mitigate	Internal coordination and analysis for necessity of crossing gates within downtown. Issues related to pedestrian traffic flows and noise.
111	Transit WA	Active	40.02	Design	UTL 20	OCS decision impacting utilities	Feed to OCS poles could impact utilities. There is uncertainty until utility mapping is complete. Minor issue.	PE	Vicky Smith	Daniel Teran	0%	$0.0 million	0.0 mths	Mitigate	Minor risks, however once utilities are mapped conflicts will be identified.
112	Transit WA	Active	40.07	Design	PSP 30	Bank Access Mitigation	Bank access is not in the base cost. Bank is entire block. Transit is impacting parking structure and drive thru for bank.	Structures Report	Wesley King		100%	$0.2 million	0.0 mths	Mitigate	Scope developed for structures engineer to explore options for access being affected. Analysis of cost for mitigation, acquisition, or buying-out. Most cost-effective and time sensitive solution for mitigation.
113	Transit WA	Active	40.02	Design	PSP 20	City of Vancouver requests underground utilities	City may request that utilities are relocated underground as part of transit construction.	IGA	Wesley King	Ray Mabey	25%	$5.0 million	0.0 mths	Avoid	Work with COV to develop an agreement that the undergrounding of utilities will be a COV cost not a project cost. Deliverable: IGA.
114	Transit WA	Active	20.06	Construction	CNS 900	Unforeseen site conditions in the guideway / park and ride sites	Minimize by utilities mapping. Contamination or fills are potential issues. Obstructions and contamination are covered elsewhere. Minor risk.	Construction	Wesley King	Frank Green	0%	$0.0 million	0.0 mths	Mitigate	Complete Geotechnical Baseline Report, incorporate in contract provisions. Review history of trolley lines in Vancouver to identify possible conflicts. Deliverable: Geotech Report, Phase I Environmental Review, Utility Report.

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115	Transit WA	Active	90	Market	CTR 40	Uncertain market conditions for Track: Steel material price fluctuations	Most issues relate to materials prices, particularly steel prices, particularly if Buy-American waivers continue to be unavailable. Assumes potential increase in material prices of 50%, and potential decrease of 15%. Assessments are minor cost change.	RFP	Paul Heydenrych	Mike Niemi	0%	$0.0 million	0.0 mths	Mitigate	Assess / Buy long lead items early and just in time delivery. Incorporate approval processes. Routine conversations with rail vendors, inclusion of escalation clause in procurement contract. Strategy matrix. Incorporate procurement of long lead items in CIP. Deliverable: Contract Implementation Plan.
116	Transit WA	Active	10.1	Design	DES 60	Embedded Track	Opportunity as TriMet currently assumes embedded track. Potential to switch from t-rail to girder rail could save money. Not quantified. Considered to be a minor risk.	RFP	Vicky Smith	Mike Niemi	0%	$0.0 million	0.0 mths	Mitigate	Assess / Buy long lead items early and just in time delivery. Incorporate approval processes. Routine conversations with rail vendors, inclusion of escalation clause in procurement contract. Strategy matrix. Incorporate procurement of long lead items in CIP. Deliverable: Contract Implementation Plan.
117	Transit WA	Active	10.12	Market	CTR 40	Uncertain market conditions for Track: Special (switches, turnout)	Combined into one category with other track for steel fluctuations. Considered to be a minor risk.	RFP	Paul Heydenrych	Mike Niemi	0%	$0.0 million	0.0 mths	Mitigate	Assess / Buy long lead items early and just in time delivery. Incorporate approval processes. Routine conversations with rail vendors, inclusion of escalation clause in procurement contract. Strategy matrix. Incorporate procurement of long lead items in CIP. Deliverable: Contract Implementation Plan.
118	Transit WA	Active	50.01	Market	DES 60	Track Operations Requirements: Special (switches, turnout) - exceeds escalation	Combined into one category with other track for steel fluctuations. Considered to be a minor risk.	RFP	Vicky Smith	Mike Niemi	0%	$0.0 million	0.0 mths	Mitigate	Additional operations requirements. Plans review by operations in conjunction with Fleet Management Plan. Routine conversations with rail vendors' inclusion of escalation clause in procurement contract. Deliverable: Contract Implementation Plan.
119	Transit WA	Active	20.01	Design	DES 30	Added aesthetics to station features	There is a significant chance that Hayden Island and City of Vancouver areas will probably both require more architectural improvements than those provided in the base case.	Final Design	Wesley King	Vicky Smith	50%	$3.0 million	0.0 mths	Mitigate	Early communication with COV, COP, input from VTAC and PWG, Station design recommendations being established. Deliverable: Conceptual Design Reports.
120	Transit WA	Active	90	Construction	CNS 70	Interfaces with other construction projects could lead to contractor conflicts	For example, conflicts over unrelated utility / street work. Potential conflicts could lead to claims. Hayden Island and McLoughlin Bridge are particular risks given close quarters. Civil/structural overlap periods are pretty small and pretty localized.	Construction Schedule	Paul Heydenrych	Mike Niemi	20%	$2.5 million	0.0 mths	Mitigate	Obtain major projects schedule from cities, transit agencies, and DOTs, incorporate any major project by others into master schedule, general conditions. Deliverable: Show Major Projects in Master Schedule (MOU).

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121	Transit WA	Active	90	Construction	CNS 40	Civil to systems Turnover risk	Risk that Contractor does not complete civil works correctly so transit systems contractor is delayed while work is re-done. Risk is higher at CRC and NPH bridges. General civil construction delays are captured elsewhere. Minor cost impact. Schedule impact could be one to three months.	RFP Development	Paul Heydenrych	Mike Niemi	50%	$0.0 million	1.0 mths	Mitigate	Clear standards to be identified in (RFP) civil contractors' quality management plan followed by QA by CRC. Assign liquidated damages to civil contractor for systems turnover.
122	Transit WA	Active	90	Construction	CTR 50	Late delivery of owner-furnished materials	Owner furnishes materials such as track and attachment materials. If those materials were to arrive late, this could trigger contractor delays. There is float available in the schedule. Most OFMs are in Washington. One possible scenario is a six-month delay at a 5% chance.	Contractor Schedule Submittal	Paul Heydenrych	Mike Niemi	5%	$0.0 million	0.2 mths	Mitigate	Build float in the to account for any possible OFM delays regular OFM procurements regular vendor progress reports, factory visits if necessary.
123	Transit WA	Active	90	Requirements	CTR 900	City of Vancouver permit delays	City of Vancouver has never permitted light rail previously. This could potentially result in delays to receiving n/ permits (Permits listed in review/status report).	Permit Application	Wesley King	Devin Reck	20%	$0.0 million	0.7 mths	Avoid	Work closely with COV and plan for any delays within the Master Permitting Plan and Schedule. Develop MOA/IGA with COV to help advance permit process. Continue regularly scheduled CRC/COV meetings.
124	Transit WA	Active	20.06	Design	DES 60	Reduction in number of Park and Ride Spaces and or P&Rs.	Plan is well established. Potential opportunity to reduce size of a park-and-ride or eliminate a park and ride if FTA approves.	FTA Funding Formula Change	Wesley King		10%	-$35.0 million	0.0 mths	Mitigate	Opportunity to reduce park and ride size should FTA funding formula be changed.
125	Transit WA	Active	70.01	Design	DES 60	Purchase more or fewer LRT vehicles under this project	Base assumes 19 vehicles. Team says this is unlikely to change. Small chance to eliminate 1 or 2 vehicles.	PLMR FFGA	Kelly Betteridge		10%	-$6.0 million	0.0 mths	Mitigate	Currently budgeted for 19 vehicles or 9.5 full size trains, possible opportunity to reduce by 1 or 2.
126	Transit WA	Active	70.01	Market	CTR 40	Significant change in LRT vehicle price	Base case has +/-10% cost risk. TriMet confirmed that competitive bidding for Milwaukie vehicle procurement includes the ability to add at least 19 vehicles for CRC. This significantly reduces the chance of a significant change in LRT vehicle price. Considered to be a minor risk.	PMLR LRV Procurement Contract	Paul Heydenrych	John Griffiths	0%	$0.0 million	0.0 mths	Avoid	Due to the competitive bid process for the Milwaukee project it's unlikely that there will be a cost change.
127	Transit WA	Active	90	Construction	CNS 70	Interface issues between civil and systems contractors	Minor issue.	RFP Development	Wesley King	Ray Mabey	0%	$0.0 million	0.0 mths	Mitigate	Milestones with liquidated damages in the initial contracts. Review of contractor QC and include CRC QA inspectors.
128	Transit WA	Active	80.08	Construction	CNS 100	Delays in system testing or start-up	For example, communications, training (issue exists primarily on the Washington side). Very unlikely - minor risk.	Construction Schedule	Paul Heydenrych	Wesley King	0%	$0.0 million	0.0 mths	Mitigate	Pre-Revenue and Operational Plan to be completed during FD.

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129	Transit WA	Active	40.02	Construction	UTL 20	Other utility relocations not completed on planned schedule	This applies to all KNOWN utilities but the relocation does not happen according to schedule.	Relocation Schedule Slippage	Daniel Teran	Devin Reck	30%	$4.0 million	0.0 mths	Mitigate	Currently developing relocation plans and timelines with the 17 public and private utilities. Also SUE Phase 2 work will look into utility avoidance measures the project and undertake in Final Design. Road Map Deliverables: Utility Relocation Schedule, Utility Agreements, Utility Coordination, and Conflict Resolution Engineering.
130	Transit WA	Active	40.02	Construction	UTL 10	Utility owners argue a project impact where none has been identified - North Side	On other projects utility owners have come back and argued a project impact where none has occurred; MINOR Cost. This applies to WA. Another risk applies to OR. Considered to be a minor risk.	Utility Owner Raises Issue	Daniel Teran	Devin Reck	0%	$0.0 million	0.0 mths	Avoid	Sue Phase 1 and Phase 2 work. Subsurface Utility Engineering Contractor will develop a detailed geo-referencing database with utility owners. Additional Deliverable is Utility Conflict Analysis.
131	Transit OR	Active	40.02	Construction	UTL 10	Utility owners argue a project impact where none has been identified - South Side	On other projects utility owners have come back and argued a project impact where none has occurred; MINOR Cost. This applies to OR. Another risk applies to WA. Considered to be a minor risk.	Utility Owner Raises Issue	Daniel Teran	Devin Reck	0%	$0.0 million	0.0 mths	Avoid	Sue Phase 1 and Phase 2 work. Subsurface Utility Engineering Contractor will develop a detailed geo-referencing database with utility owners. Additional Deliverable is Utility Conflict Analysis.
132	Transit WA	Active	40.02	Construction	UTL 20	Delay relocating Qwest lines	Qwest lines conflict with light rail in Vancouver. Qwest has said relocation will take four years. CRC meeting with Qwest. Qwest will not relocate prior to ROD. WSDOT can't reimburse pre-ROD. Qwest franchise agreements with Vancouver have expired. WSDOT looking for way to incentivize Qwest to move. Might also mitigate by paying to move. Minor cost and not modeled.	Qwest Cannot Meet Schedule	Daniel Teran	Devin Reck	30%	$0.0 million	2.7 mths	Mitigate	Sue Phase 1 and Phase 2 work. Subsurface Utility Engineering Contractor will develop a detailed geo-referencing database and schedule with utility owners.
133	Transit WA	Active	40.02	Design	PSP 20	Undergrounding of overhead utilities on McLoughlin/17th St would increase costs	City may ask project to underground utilities on McLoughlin. Minor cost and schedule risk.	COV Request or City Code	Daniel Teran	Devin Reck	0%	$0.0 million	0.0 mths	Avoid	Avoid undergrounding, develop IGA with COV addressing undergrounding on 17th/McLoughlin as a betterment.
134	Transit WA	Active	40.02	Construction	UTL 20	Utility relocation will be difficult in congested downtown area	May find unanticipated utilities and run into unanticipated costs. Mitigating by surveying. Residual risk is minor.	Utility Relocation	Daniel Teran	Devin Reck	0%	$0.0 million	0.0 mths	Accept	Potholing and site investigation, traffic control planning with COV / COP. Deliverable: Conduct of Construction Agreement with Cities.
135	Highway OR	Active	40.02	Construction	UTL 20	NPH utility relocation delays	Many utilities in NPH. Gas line and water line are particular issues. Cost of relocating NPH utilities will belong to CRC. Gas and water line need to be relocated prior to contractor starting. Jump span would be early on in the project.	Relocation Schedule Slip	Daniel Teran	Devin Reck	30%	$0.0 million	1.2 mths	Accept	Sue Phase 1 & 2 work. Develop a relocating plan through early coordination, detailed utility mapping, & conflict analysis.

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									PRIMARY	SECONDARY	LIKELIHOOD	COST	SCHEDULE	STRATEGY	ACTION
136	Program Wide	Active	80.06	Requirements	CTR 70	Lack of Resources for Regulatory Agency Staff Reviews	Lack of resources for regulatory agency staff review and processing of permits will result in agencies not meeting project schedule timelines for review and issuance of permits.		Heather Wills		0%	$0.0 million	0.0 mths	Avoid	
137	Columbia River Bridges	Active	80.06	Requirements	ENV 30	Project must have Section 408 permit for levee before Section 404 permit for MRC	This risk could affect timing of Main River Crossing construction. USACE policy requires projects to have Section 408 permit before a Section 404 permit will be issued. While there is precedence for uncoupling the two permits, we do not know if this approach or having a "phased" permit is feasible for the CRC.		Heather Wills	Steve Morrow	40%	$0.0 million	4.8 mths	Mitigate	Continued close coordination with the USACE to ensure question re: uncoupling the permits is answered in a timely manner. If the permits cannot be uncoupled, design of project elements that would affect the levee system will need to be accelerated to avoid adversely affecting construction of the Main River Crossing. No additional coordination meetings are anticipated.
138	Columbia River Bridges	Active	80.06	Design	DES 20	USCG requires a greater navigation clearance	Project has been recently advised that the USGS (and USACE) may require a greater navigation clearance than is currently proposed.				0%	$0.0 million	0.0 mths	Mitigate	
139	Transit WA	Active	60.01	Design	ROW 10	Use C-TRAN Condemnation Authority			Wesley King		0%	$0.0 million	0.0 mths	Mitigate	
140	Transit WA	Active	60.01	Design	ROW 10	Use COV Condemnation Authority			Wesley King		0%	$0.0 million	0.0 mths	Mitigate	
141	Transit WA	Active	20.06	Design	PSP 30	Undergrounding of Park and Rides not covered in FEIS			Wesley King		0%	$0.0 million	0.0 mths	Mitigate	
142	Highway OR	Active	80.06	Design	ENV 900	Levee improvements cost more than anticipated and permitting delays construction		USACE Permit Requirements	Laura Peterson		60%	$2.0 million	12.0 mths	Mitigate	To mitigate, the team is meeting with the Corps to determine what improvements are needed and to try to negotiate separation of the CRB permit from the NPH permit.
143	OR Wide	Active	80.07	Design	ROW 50	Rights of Entry are delayed	There is reluctance to engage the property owners during the discussions with the Oregon legislature. Establishing the final r/w boundary is dependent on having an accurate terrain model which is dependent on gaining right of entry to private property.	Delay in Engaging Owners	Joe Gray		60%	$0.0 million	3.6 mths	Mitigate	The project team is having discussions with the legislature now.
144	Transit WA	Active	20.06	Design	DES 60	Central Park and Ride Exterior Foundation Wall	Preliminary foundation design assumes no earth loads on basement walls for the Central Park and Ride. This reduces basement wall thickness and amount of internal shear walls. A perimeter MSE wall is assumed to retain earth loads.		Joe Eskew		75%	$2.5 million	4.5 mths	Avoid	Final design could provide internal load bearing/shear walls with a reconfiguration of basement parking.

RISK ID	PRIMARY PROJECT	STATUS	SCC	CATEGORY	RBS	RISK EVENT	DESCRIPTION	TRIGGER	RISK OWNER		ESTIMATED PRE-RESPONSE IMPACT			RESPONSE	
									PRIMARY	SECONDARY	LIKELIHOOD	COST	SCHEDULE	STRATEGY	ACTION
145	Transit WA	Active	20.06	Design	DES 60	Park and Ride Deep Foundations	Preliminary geotechnical information suggests deep foundations may be necessary to support all three park and ride structures while limiting settlement. Preliminary foundation design assumed continuous mat foundations and soil reinforcement to limit settlement.		Joe Eskew		50%	$115.0 million	6.0 mths	Avoid	

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