



Considering  
the significance  
of our natural  
environment



# Cost Estimate Validation Process (CEVP) Report

March 2026

## Cost Estimate Validation Process (CEVP)

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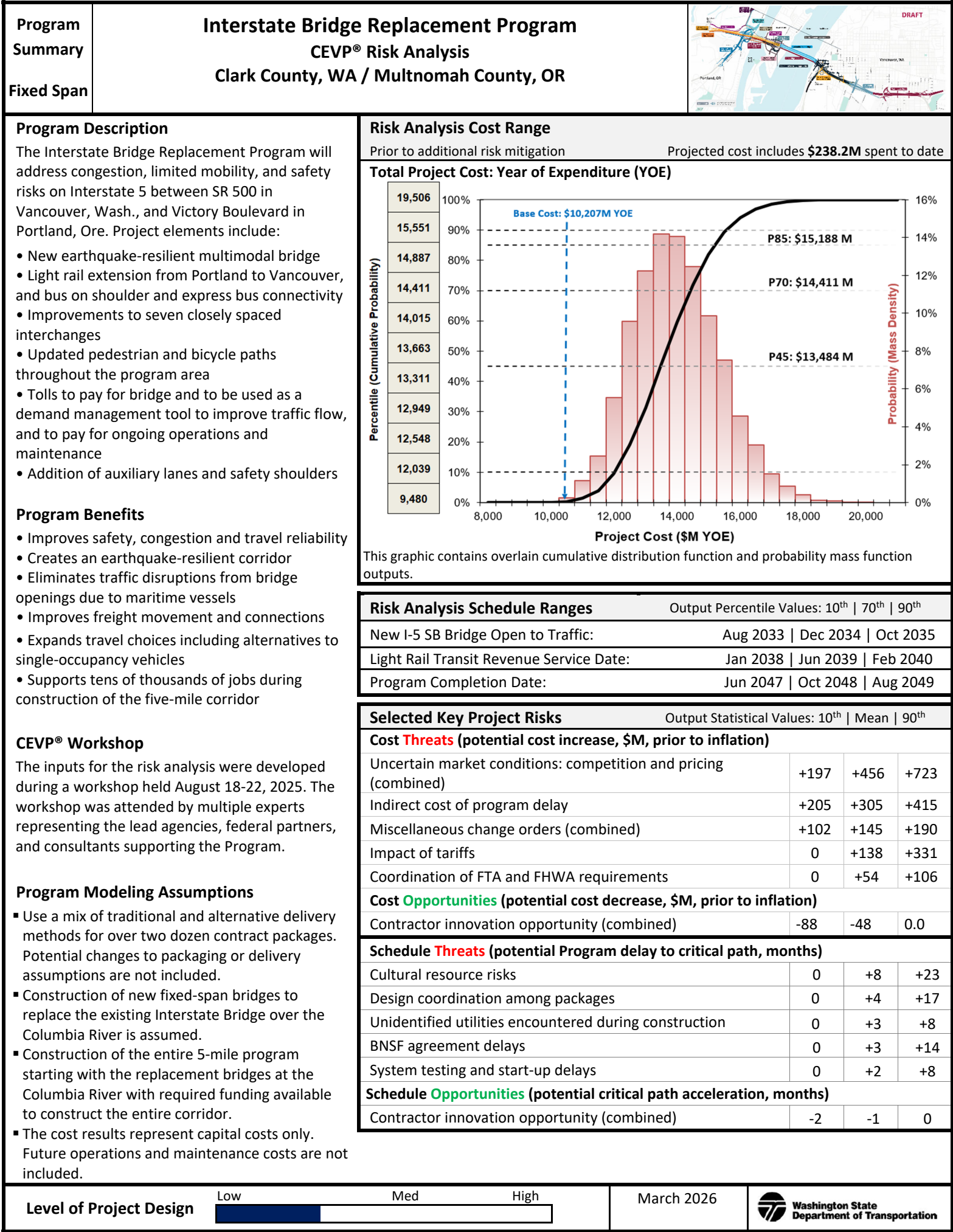
## ACRONYMS AND ABBREVIATIONS

| Acronym/Abbreviation | Definition                                      |
|----------------------|-------------------------------------------------|
| C-TRAN               | Clark County Public Transportation              |
| CCI                  | Construction Cost Index                         |
| CDF                  | Cumulative Distribution Function                |
| CEVP                 | Cost Estimate Validation Process                |
| CM/GC                | Contract Manager / General Contractor           |
| CN                   | Construction                                    |
| CRB                  | Columbia River Bridge                           |
| CRBA                 | Columbia River Bridges and Approaches           |
| CRC                  | Columbia River Crossing                         |
| CSRA                 | Cost and Schedule Risk Assessment               |
| C-TRAN               | Clark County Public Transportation Benefit Area |
| DBB                  | Design-Bid-Build                                |
| FEIS                 | Final Environmental Impact Statement            |
| FFGA                 | Full Funding Grant Agreement                    |
| FHWA                 | Federal Highway Administration                  |
| FTA                  | Federal Transit Administration                  |
| I-5                  | Interstate 5                                    |
| IBR                  | Interstate Bridge Replacement                   |
| LPA                  | Locally Preferred Alternative                   |
| LRT                  | Light Rail Transit                              |
| MAX                  | Metropolitan Area Express                       |

## Cost Estimate Validation Process (CEVP) Report

| Acronym/Abbreviation | Definition                                     |
|----------------------|------------------------------------------------|
| NB                   | Northbound                                     |
| NEPA                 | National Environmental Policy Act              |
| NTP                  | Notice to Proceed                              |
| ODOT                 | Oregon Department of Transportation            |
| P70                  | 70th Percentile                                |
| PDB                  | Progressive Design-Build                       |
| PE                   | Preliminary Engineering                        |
| PEI                  | Preliminary Engineering Cost Index             |
| PM                   | Program Management                             |
| PMF                  | Probability Mass Function                      |
| PNCD                 | Preliminary Navigation Clearance Determination |
| Program              | Interstate Bridge Replacement Program          |
| RBS                  | Risk Breakdown Structure                       |
| RFQ                  | Request for Qualifications                     |
| RFP                  | Request for Proposals                          |
| RMV                  | Real Market Value                              |
| ROD                  | Record of Decision                             |
| ROW                  | Right-of-Way                                   |
| ROWI                 | Right-of-Way Cost Index                        |
| SB                   | Southbound                                     |
| SME                  | Subject Matter Expert                          |
| SR                   | State Route                                    |

| Acronym/Abbreviation | Definition                                                |
|----------------------|-----------------------------------------------------------|
| TriMet               | Tri-County Metropolitan Transportation District of Oregon |
| USCG                 | U.S. Coast Guard                                          |
| WSDOT                | Washington State Department of Transportation             |
| YOE                  | Year-of-Expenditure                                       |



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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| <div>Program Summary</div> <div>Movable Span Scenario</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <div>Interstate Bridge Replacement Program</div> <div>CEVP® Risk Analysis</div> <div>Clark County, WA / Multnomah County, OR</div> <div>August 2025 Workshop</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <div></div>                                                          |        |        |        |        |        |        |        |        |        |        |                                                                                               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                          |    |    |   |
| <div>Program Description</div> <p>The Interstate Bridge Replacement Program will address congestion, limited mobility, and safety risks on Interstate 5 between SR 500 in Vancouver, Wash., and Victory Boulevard in Portland, Ore. Project elements include:</p> <ul style="list-style-type: none"><li>• New earthquake-resilient multimodal bridge</li><li>• Light rail extension from Portland to Vancouver, and bus on shoulder and express bus connectivity</li><li>• Improvements to seven closely spaced interchanges</li><li>• Updated pedestrian and bicycle paths throughout the program area</li><li>• Tolls to pay for the bridges and to be used as a demand management tool to improve traffic flow, and to pay for ongoing operations and maintenance</li><li>• Addition of auxiliary lanes and safety shoulders</li></ul> <div>Program Benefits</div> <ul style="list-style-type: none"><li>• Improves safety, congestion and travel reliability</li><li>• Creates an earthquake-resilient corridor</li><li>• Improves freight movement and connections</li><li>• Expands travel choices including alternatives to single-occupancy vehicles</li><li>• Supports tens of thousands of jobs during construction of the five-mile corridor</li></ul> <div>CEVP® Workshop</div> <p>The inputs for the risk analysis were developed during a workshop held August 18-22, 2025. The workshop was attended by multiple experts representing the lead agencies, federal partners, and consultants supporting the Program.</p> <div>Program Modeling Assumptions</div> <ul style="list-style-type: none"><li>▪ Use a mix of traditional and alternative delivery methods for over two dozen contract packages. Potential changes to packaging or delivery assumptions are not included.</li><li>▪ Construction of new movable-span bridges to replace the existing Columbia River Bridge is assumed.</li><li>▪ Construction of the entire 5-mile program starting with the replacement bridges at the Columbia River with required funding available to construct the entire corridor.</li><li>▪ The cost results represent capital costs only. Future operations and maintenance costs are not included.</li></ul> | <div>Risk Analysis Cost Range</div> <div>Prior to additional risk mitigation</div> <div>Projected cost includes \$238.2M spent to date</div> <div>Total Project Cost: Year of Expenditure (YOE)</div> <div><table><tr><td>22,440</td></tr><tr><td>17,447</td></tr><tr><td>16,677</td></tr><tr><td>16,139</td></tr><tr><td>15,681</td></tr><tr><td>15,278</td></tr><tr><td>14,853</td></tr><tr><td>14,419</td></tr><tr><td>13,950</td></tr><tr><td>13,335</td></tr><tr><td>10,327</td></tr></table></div> <div>This graphic contains overlain cumulative distribution function and probability mass function outputs.</div> | 22,440                                                               | 17,447 | 16,677 | 16,139 | 15,681 | 15,278 | 14,853 | 14,419 | 13,950 | 13,335 | 10,327 | <div>Risk Analysis Schedule Ranges</div> <div>Output Percentile Values: 10<sup>th</sup>   70<sup>th</sup>   90<sup>th</sup></div> <table><tr><td>New I-5 SB Bridge Open to Traffic:</td><td>Jan 2036   Aug 2037   Jun 2038</td></tr><tr><td>Light Rail Transit Revenue Service Date:</td><td>May 2039   Jan 2041   Jan 2042</td></tr><tr><td>Program Completion Date:</td><td>Feb 2049   Oct 2050   Sept 2051</td></tr></table> <div>Selected Key Project Risks</div> <div>Output Statistical Values: 10<sup>th</sup>   Mean   90<sup>th</sup></div> <div>Cost Threats (potential cost increase, \$M, prior to inflation)</div> <table><tr><td>Uncertain market conditions: competition and pricing (combined)</td><td>+218</td><td>+539</td><td>+872</td></tr><tr><td>Indirect cost of program delay</td><td>+191</td><td>+307</td><td>+437</td></tr><tr><td>Miscellaneous change orders (combined)</td><td>+109</td><td>+155</td><td>+204</td></tr><tr><td>Impact of tariffs</td><td>0</td><td>+152</td><td>+364</td></tr><tr><td>Coordination of FTA and FHWA requirements</td><td>0</td><td>+65</td><td>+125</td></tr></table> <div>Cost Opportunities (potential cost decrease, \$M, prior to inflation)</div> <table><tr><td>Contractor innovation opportunity (combined)</td><td>-83</td><td>-38</td><td>0</td></tr></table> <div>Schedule Threats (potential Program delay to critical path, months)</div> <table><tr><td>Cultural resource risks</td><td>0</td><td>+8</td><td>+23</td></tr><tr><td>Columbia River Bridge Contract Guaranteed Maximum Price</td><td>0</td><td>+6</td><td>+11</td></tr><tr><td>Negotiation Delays</td><td>0</td><td>+6</td><td>+11</td></tr><tr><td>Systems Testing or Start-Up Delays</td><td>0</td><td>+6</td><td>+11</td></tr><tr><td>Missed In-Water Work Window</td><td>0</td><td>+3</td><td>+5</td></tr><tr><td>Owner agency decision making following Preliminary Navigation Clearance Decision requiring a movable span</td><td>0</td><td>+3</td><td>+9</td></tr></table> <div>Schedule Opportunities (potential critical path acceleration, months)</div> <table><tr><td>Contractor innovation opportunity (combined)</td><td>-6</td><td>-2</td><td>0</td></tr></table> | New I-5 SB Bridge Open to Traffic: | Jan 2036   Aug 2037   Jun 2038 | Light Rail Transit Revenue Service Date: | May 2039   Jan 2041   Jan 2042 | Program Completion Date: | Feb 2049   Oct 2050   Sept 2051 | Uncertain market conditions: competition and pricing (combined) | +218 | +539 | +872 | Indirect cost of program delay | +191 | +307 | +437 | Miscellaneous change orders (combined) | +109 | +155 | +204 | Impact of tariffs | 0 | +152 | +364 | Coordination of FTA and FHWA requirements | 0 | +65 | +125 | Contractor innovation opportunity (combined) | -83 | -38 | 0 | Cultural resource risks | 0 | +8 | +23 | Columbia River Bridge Contract Guaranteed Maximum Price | 0 | +6 | +11 | Negotiation Delays | 0 | +6 | +11 | Systems Testing or Start-Up Delays | 0 | +6 | +11 | Missed In-Water Work Window | 0 | +3 | +5 | Owner agency decision making following Preliminary Navigation Clearance Decision requiring a movable span | 0 | +3 | +9 | Contractor innovation opportunity (combined) | -6 | -2 | 0 |
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| 15,278                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| Uncertain market conditions: competition and pricing (combined)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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| Indirect cost of program delay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| Miscellaneous change orders (combined)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| Impact of tariffs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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| Coordination of FTA and FHWA requirements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| Contractor innovation opportunity (combined)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| Cultural resource risks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| Columbia River Bridge Contract Guaranteed Maximum Price                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| Negotiation Delays                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| Systems Testing or Start-Up Delays                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| Missed In-Water Work Window                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| Owner agency decision making following Preliminary Navigation Clearance Decision requiring a movable span                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| Contractor innovation opportunity (combined)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| <div>Level of Project Design</div> <div><div>Low</div><div>Med</div><div>High</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <div>March 2026</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <div></div> <div>Washington State Department of Transportation</div> |        |        |        |        |        |        |        |        |        |        |                                                                                               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## EXECUTIVE SUMMARY

A probabilistic cost and schedule risk assessment (CSRA) was performed for the Interstate Bridge Replacement (IBR) Program (“the Program”) following the Washington State Department of Transportation’s (WSDOT’s) Cost Estimate Validation Process (CEVP) methodology (WSDOT 2018) and consistent with Federal Highway Administration (FHWA) CSRA requirements for Major Projects (FHWA 2007). The objectives of the CEVP analysis were to provide independent review of Program cost and schedule estimates and to quantify uncertainty and risk associated with those estimates. A risk assessment workshop was held from August 18 to 22, 2025, and was attended by Program team members and subject matter experts (SMEs) from WSDOT, Oregon Department of Transportation (ODOT), Tri-County Metropolitan Transportation District of Oregon (TriMet), FHWA, Federal Transit Administration (FTA), and industry representatives. The risk workshop was followed by probabilistic analyses of Program cost and schedule.

Two configuration options were analyzed for the Columbia River Bridge structures: a fixed span option and a movable span option. Following the U.S. Coast Guard’s January 2026 issuance of a revised Preliminary Navigation Clearance Determination (PNCD), the movable-span option is no longer being considered. The PNCD specifies a minimum vertical navigation clearance of 116 feet, which corresponds to the fixed-span option. All inputs and results presented in this report represent the fixed span option unless otherwise indicated.

## Program Schedule Review

The Program “base” schedule was summarized in a flowchart depicting the Program strategy at an appropriate level of detail for the risk analysis. The flowchart defines a set of key activities, milestones, and precedence relationships and is used to model the Program schedule (including delays or accelerations due to risk events) and to calculate escalated year-of-expenditure (YOE) Program costs. The schedule reflects the current assumed Program delivery approach, which includes 29 contract packages plus programmatic activities. The schedule flowchart was reviewed during the risk workshop, and comments were incorporated. The base Program completion date (prior to consideration of risk) is **June 2045**.

## Program Cost Review

The Program cost estimate was reviewed by independent cost estimation experts and additional SMEs representing a variety of technical disciplines prior to, during, and after the risk workshop. Contingencies were removed to develop a base cost estimate of approximately **\$7,812 million** in July 2025 dollars. This deterministic base cost excludes inflation, estimating uncertainties, and risk, which are addressed through the risk analysis. Base uncertainty ranges for unit prices, quantities, and percentage markups were established for the estimate. The uncertainties were assessed in terms of ranges (i.e., 10th to 90th percentiles), relative to the deterministic base cost and mapped to individual contract packages. The professional judgment of the cost estimation and risk SMEs was used to inform the uncertainty ranges and associated correlations.

## Program Risk Assessment

A risk register was developed for the Program, which included identification and characterization of specific risks (threats and opportunities) to the Program cost and schedule. A total of 486 risks were identified, of which 135 were determined to be significant (the remainder either fell below predetermined screening thresholds and were thus considered minor, were excluded, or have been resolved and retired). Risks were characterized and quantified based on the collective professional judgment of the SMEs assembled for the workshop. The risk quantifications included potential impacts to direct Program cost and schedule (relative to the base assumptions) and the likelihood of those impacts occurring. The risk quantifications reflected the proactive risk mitigation strategies currently being pursued by the Program team.

## Risk Analysis

The inputs developed in the workshop (including base cost, base schedule, inflation, uncertainties, and risks) were loaded into a probabilistic, integrated (i.e., cost-loaded schedule) model that incorporated Monte Carlo simulation techniques to generate probability distributions of key performance measures related to cost and schedule, along with prioritized risk rankings. The simulation involved the generation of 10,000 independent potential outcomes and statistical compilation of selected results.

## Program Results

Results from probabilistic analyses are commonly communicated in terms of the probability of not exceeding a particular value (also known as a percentile or, less formally, confidence level). For example, the 70th percentile means that there is a 70% likelihood that the amount will not be exceeded (conversely, there is a 30% likelihood that the value will be greater than that amount).

For the Program as defined in this CEVP, the 70th percentile cost in YOE dollars is **\$14,411** million, and the 10th to 90th percentile (i.e., 80% confidence level) range is **\$12,039** million to **\$15,551** million.

Key Program cost risks include the following:

- Uncertain market conditions: competition and pricing
- Indirect cost of Program delay
- Miscellaneous change orders following award of construction contracts
- Impact of tariffs
- Coordination of technical provisions and administrative requirements for both FTA and FHWA

Key Program estimating uncertainties (related to base cost) include the following:

- Price uncertainty: deep soil mixing
- Price uncertainty: superstructure steel (marine and upland)

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- Uncertainty in the construction cost inflation rate
- Price uncertainty: superstructure concrete
- Miscellaneous items uncertainty: Columbia River Bridge

The 70th percentile Program completion date is **October 2048**, with a 10th to 90th percentile range of **June 2047** to **August 2049**. Schedule risks to key Program milestones include the following:

- Cultural resource risks
- Design coordination among packages
- Unidentified utilities encountered during construction
- Completion of BNSF agreements
- Systems testing or start-up delays

## Assumptions and Exclusions

The following are the major assumptions and exclusions that apply to the results described in this report.

- Program results reflect the Modified Locally Preferred Alternative.
- The Program is assumed to be delivered through a mix of traditional and alternative delivery methods, including 29 contract packages. Potential changes to packaging or delivery assumptions are not included.
- Construction of the entire 5-mile area of Program improvements is assumed, starting with the replacement bridges at the Columbia River, with funding available as needed. Potential resequencing or deferral of Program elements (e.g., due to fiscal constraints) is not included.
- Construction of two new fixed-span bridges to replace the existing Interstate Bridge over the Columbia River is assumed.
- The cost results include capital costs only. Future operations and maintenance costs are not included.

Finally, the results represent a “snapshot in time” as of the date of the evaluation. At the time of the review, the construction industry was experiencing significant cost escalation, and future trends were difficult to predict. The cost inflation rates and market conditions risks developed for the CEVP reflect the understanding and professional judgment of the workshop participants based on available information at the time. Current assumptions related to packaging, sequencing, and delivery methods will be refined by the Program, with the expectation that future CEVP reviews will reflect updated information related to initial-phase delivery and Program sequencing. It is expected that schedules, estimates, and risk profiles will be refined—and uncertainties reduced—as the Program progresses.

# 1. INTRODUCTION

## 1.1 Overview

A probabilistic cost and schedule risk assessment (CSRA) was performed for the Interstate Bridge Replacement (IBR) Program (“the Program”) following the Washington State Department of Transportation’s (WSDOT’s) Cost Estimate Validation Process (CEVP) methodology and consistent with Federal Highway Administration (FHWA) CSRA requirements for Major Projects. The objectives of the CEVP analysis were to provide independent review of Program cost and schedule estimates and to quantify uncertainty and risk associated with those estimates. A risk assessment workshop was held August 18 to 22, 2025, and was attended by Program team members and subject matter experts (SMEs) from WSDOT, Oregon Department of Transportation (ODOT), Tri-County Metropolitan Transportation District of Oregon (TriMet), FHWA, Federal Transit Administration (FTA), and industry representatives (Appendix A). The risk workshop was followed by probabilistic analyses of Program cost and schedule.

## 1.2 Approach

The general approach used for the CEVP analysis is summarized in the following steps:

1. Establish a common understanding of the Program among the participants, including overall scope, strategy, status, existing conditions, and key assumptions.
2. Develop a base schedule in the form of a flowchart depicting the high-level sequence of key activities and milestones, including their durations and predecessor-successor relationships, that represents the assumed Program schedule if “everything goes as planned” (i.e., no built-in contingency, float, or other consideration of potential risk is included).
3. Establish a base cost that represents the “best estimate” for the Program if “everything goes as planned” (i.e., both explicit and implicit contingencies are removed). The base cost includes allowances for “known but not quantified” items (incidentals).
4. Quantify uncertainty in the base estimates where appropriate to represent the potential variation (due to variability or lack of information) in the base values (e.g., unit price, quantity, percentage markups, duration, inflation rates, etc.), consistent with the assumptions used to prepare the base estimates.
5. Identify potential risks, considering both threats and opportunities for each key discipline associated with the Program. Risks are defined as events characterized by a probability of occurrence and an impact if the event occurs (in terms of deltas relative to the base cost and/or schedule for specific schedule activities) and are documented in a risk register. For risks determined to be significant (based on a predefined cutoff threshold), the direct cost and schedule impacts and associated probability are quantified based on the professional judgment of the SMEs. The risk quantifications consider risk management actions that are being implemented or planned by the Program. Possible additional mitigation strategies for major risks

are discussed as time allows during the workshop and subsequently reviewed and evaluated by the Program team.

6. Develop a probabilistic model that integrates the base cost and schedule (including uncertainties, where applicable), explicitly represents individual risks, and includes correlations and dependencies as appropriate. The model is used to generate probability distributions for Program cost and schedule milestone completion dates, along with an importance analysis ranking of the input factors (base uncertainties and risks) relative to the cost and schedule outputs to guide future risk management. The resulting probability distributions can be used to evaluate potential contingency levels for cost and schedule. A risk-based contingency level for cost or schedule can be determined from the difference between the output value at a chosen percentile (e.g., 70th) and the base value without contingency.

## 1.3 Common Assumptions

WSDOT maintains a library of CEVP support information, including common assumptions for its risk assessments. The current list of assumptions is contained within Appendix H of the Project Risk Management Guide (WSDOT 2018).

## 2. PROGRAM STATUS AND ASSUMPTIONS

### 2.1 Program Overview

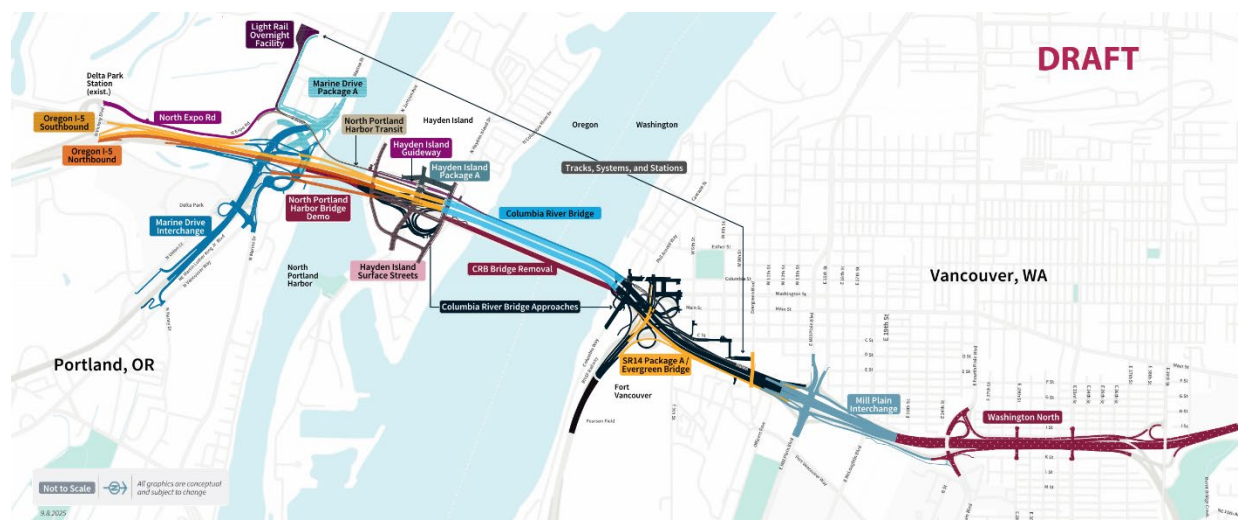
The IBR Program is a bridge, transit, and highway improvement project to address safety and mobility in the Interstate 5 (I-5) corridor between Portland, Oregon, and Vancouver, Washington. I-5 is the main interstate corridor on the West Coast of the United States, stretching from Canada to Mexico, and is one of only two roadway crossings of the Columbia River in the Portland-Vancouver metropolitan area. The IBR Program focuses on a 5-mile segment of the I-5 corridor that extends from Victory Boulevard in Portland to State Route (SR) 500 in Vancouver. In combination with highway and transit improvements, the IBR Program would replace the Interstate Bridge over the Columbia River. Transit service between Portland, Oregon, and Vancouver, Washington, would include extending the TriMet Metropolitan Area Express (MAX) Light Rail Transit (LRT) Yellow Line from the current terminus at the Expo Station in Portland to Vancouver. In addition, the Clark County Public Transportation Benefit Area (C-TRAN) would operate zero-emission express buses using the inside highway shoulder through the IBR Program area. These services are provided by partner agencies from different states and serve different travel markets.

This section describes the major scope and cost elements of the Program by package. With 29 distinct work packages, the Program integrates structural, roadway, and transit elements across two states and multiple jurisdictions. Key scope components include:

- Over 5 miles of I-5 corridor improvements, including improvements to existing interchanges, one auxiliary lane in each direction across the bridge, collector-distributor segments, extending LRT, and adding and improving active transportation facilities connections.
- Replacement of two bridges over the Columbia River between Oregon and Washington with modern, seismically resilient fixed-span structures.
- Construction of 48 bridge structures, including highway, transit, and arterial crossings.
- Extension of LRT approximately 2 miles into Washington, with four new stations and supporting systems infrastructure.
- Reconstruction of interchanges at Marine Drive, Hayden Island, SR 14, Mill Plain, Fourth Plain, Victory Boulevard, and SR 500.
- Two park-and-ride facilities supporting new C-TRAN and TriMet transit services.
- Multimodal investments, including shared-use paths, bike and pedestrian facilities, and a lid structure in Vancouver.

Figure 2-1 illustrates the Program setting and the major elements of the Modified Locally Preferred Alternative (LPA).

Figure 2-1. Program Modified LPA Overview



## 2.2 National Environmental Policy Act Status

FHWA and FTA are the lead federal agencies responsible for ensuring that the Program complies with the National Environmental Policy Act (NEPA) and its associated regulations and policies. A final environmental impact statement (FEIS) and Record of Decision (ROD) were issued for the former Columbia River Crossing (CRC) project in 2011. A series of NEPA re-evaluations were subsequently completed, most recently in 2022, to reflect changes to the Program and regulatory requirements since the original ROD was issued. The 2022 re-evaluation determined that the original environmental impact statement remains valid, but supplemental analysis was required for the IBR Program. A final supplemental environmental impact statement and amended ROD are expected to be issued in spring/summer 2026.

## 2.3 Scenarios and Sensitivity Analyses

The results presented in this report represent the Modified LPA with fixed-span Columbia River Bridge (CRB) structures, as described in Section 2.1. During the CEVP workshop, a movable-span option was also evaluated. The U.S. Coast Guard (USCG) subsequently issued a revised Preliminary Navigation Clearance Determination (PNCD) on January 16, 2026, specifying a minimum vertical navigation clearance of 116 feet, which corresponds to the fixed-span option. All inputs and results contained in this report correspond to the fixed-span option unless otherwise specified.

Additionally, because of the uncertainty surrounding the impact of tariffs on Program cost, three scenarios were analyzed:

1. Tariffs addressed as a risk (with 50% probability of occurrence): all results reflect this assumption unless otherwise specified.

2. Tariff impacts excluded (i.e., the probability of future tariffs impacting the Program cost in addition to the base estimate and inflation forecast is zero).
3. Tariff impacts assumed (i.e., the probability of future tariffs impacting the Program cost in addition to the base estimate and inflation forecast is 100%).

The potential range of cost impacts associated with future tariffs was developed by the cost estimation SMEs. Summary results for the movable span and tariff scenarios are presented in Section 4.2.5.

## 2.4 Key Assumptions and Exclusions

Assumptions are necessary for any analysis, and the results of the analysis must clearly state the assumptions upon which they are based. Probabilistic assessments attempt to include all relevant uncertainties so that the results are as inclusive and robust as possible (i.e., the results will “stand the test of time”). The more uncertainties that are excluded, the more “constrained” or “conditional” the results are. In many cases, however, an owner has good reason to exclude particular uncertainties from the analysis. The analysis is based on the following key assumptions. Changes to these assumptions were not quantified or modeled. Therefore, the reader should be mindful of these exclusions when reviewing and interpreting the results.

- Program results reflect the Modified LPA.
- The Program is assumed to be delivered through a mix of traditional and alternative delivery methods, including 29 contract packages. Potential changes to packaging or delivery assumptions are not included.
- Construction of the entire 5-mile area of Program improvements is assumed, starting with the replacement bridges at the Columbia River, with funding available as needed. Potential resequencing or deferral of Program elements (e.g., due to fiscal constraints) is not included.
- Construction of two new fixed-span bridges to replace the existing Interstate Bridge over the Columbia River is assumed.
- The cost results include capital costs only. Future operations and maintenance costs are not included.

Finally, the results represent a “snapshot in time” as of the date of the evaluation. At the time of the review, the construction industry was experiencing significant cost escalation, and future trends were difficult to predict. Inflation rates and market condition risks developed for the CEVP reflect the understanding and professional judgment of the workshop participants based on available information at the time. Current assumptions related to packaging, sequencing, and delivery methods will be refined by the Program, with the expectation that future CEVP reviews will reflect updated information related to initial-phase delivery and Program sequencing. It is expected that schedules, estimates, and risk profiles will be refined (and uncertainties reduced) as the Program progresses.

## 3. BASE COST AND SCHEDULE

### 3.1 Base Schedule

The assumed Program base schedule was summarized in a flowchart depicting the Program strategy at an appropriate level of detail for the risk analysis. The flowchart defines a set of key activities, milestones, and precedence relationships, and forms the basis for the Program schedule model, including delays or accelerations due to risk events. The schedule flowchart was based on IBR Program Schedule Update 29, dated July 11, 2025, with targeted adjustments for the CEVP. The flowchart was reviewed during the risk workshop, and comments were incorporated.

The schedule flowchart contains over 250 activities and milestones and reflects the current Program packaging and delivery plan, which includes the contract packages described in Table 3-1. For each package, one or more activities representing each major cost category (preliminary engineering [PE], right of way [ROW], and construction [CN]) are included, along with major Program and package-level milestones. Schedule logic for each package reflects the assumed delivery method and sequencing among packages, if applicable. Assumed delivery methods include design-build (DB), design-bid-build (DBB), progressive design-build (PDB), and contract manager/general contractor (CM/GC). Two-step sealed bids are assumed for bus and vehicle procurement packages.

Certain activities are subject to in-water work windows. The impact of these windows on the Program schedule is automatically accounted for in the integrated Program risk model.

Table 3-1. Contract Packaging Assumptions

| Package Number | Package Name                        | Assumed Delivery Method |
|----------------|-------------------------------------|-------------------------|
| 0              | Programmatic Costs                  | N/A                     |
| 1              | 65th Street C-TRAN O&M Bus Facility | DBB                     |
| 2              | Bus Procurement                     | 2-step Sealed Bid       |
| 3              | Bus Shelters                        | DBB                     |
| 4              | Approaches                          | PDB                     |
| 5              | Columbia River Bridge               | PDB                     |
| 6              | Columbia River Bridge Removal       | DBB                     |
| 7              | Evergreen Park & Ride               | DB                      |
| 8              | Hayden Island Guideway              | CM/GC                   |

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| Package Number | Package Name                                   | Assumed Delivery Method |
|----------------|------------------------------------------------|-------------------------|
| 9              | Hayden Island Package A (Hayden Island Center) | DBB                     |
| 10             | Hayden Island Surface Streets                  | DBB                     |
| 11             | Light Rail Overnight Facility                  | CM/GC                   |
| 12             | LRV Procurement                                | 2-step Sealed Bid       |
| 13             | Marine Drive Interchange                       | CM/GC                   |
| 14             | Marine Drive Package A                         | CM/GC                   |
| 15             | Mill Plain Interchange                         | DB                      |
| 16             | North Expo Road                                | DBB                     |
| 17             | North Portland Harbor Bridge Removal           | DBB                     |
| 18             | North Portland Harbor Transit Bridge           | CM/GC                   |
| 19             | Oregon I-5 Northbound                          | CM/GC                   |
| 20             | Oregon I-5 Southbound                          | CM/GC                   |
| 21             | Oregon Station Finishes                        | DBB                     |
| 22             | Pre-Completion Tolling Signage                 | DBB                     |
| 23             | Ruby Junction TriMet Facility Expansion        | CM/GC                   |
| 24             | SR-14 Package A                                | DBB                     |
| 25             | Track, Systems & Stations                      | CM/GC                   |
| 26             | Washington Station Finishes                    | DBB                     |
| 27             | Washington North                               | DB                      |
| 28             | Waterfront Park & Ride                         | DB                      |
| 29             | West Hayden Island Mitigation                  | DBB                     |

CM/GC = contract manager / general contractor; C-TRAN = Clark County Public Transportation Benefit Area; DB = design-build; DBB = design-bid-build; I-5 = Interstate 5; LRV = light-rail vehicle; O&M = operation and maintenance; PDB = progressive design-build; SR = state route

The base Program completion date (prior to consideration of risk) is **June 2045**. The base completion dates for additional key schedule milestones are summarized in Table 3-2.

Table 3-2. Base Milestone Schedule Completion Dates

| Milestone                                        | Base Targeted Completion Date |
|--------------------------------------------------|-------------------------------|
| Issue Record of Decision                         | April 2026                    |
| Pre-Completion Tolling Go Live                   | April 2027                    |
| FTA Full Funding Grant Agreement                 | September 2028                |
| Start of Columbia River Bridge In-Water Work     | March 2028                    |
| New I-5 Southbound Bridge Complete               | July 2032                     |
| Shift I-5 to New Southbound Bridge               | October 2032                  |
| Light-Rail Transit Revenue Service Date          | January 2036                  |
| Interstate Bridge, Approaches, and Demo Complete | May 2036                      |
| Program Complete                                 | June 2045                     |

FTA = Federal Transit Administration; I-5 = Interstate 5

The schedule flowchart is shown in Appendix C. The red on the flowchart reflect the base critical path to Program completion.

## 3.2 Base Cost

### 3.2.1 Deterministic Base Program Cost

The Program cost estimate used in the CEVP analysis was developed by the Program team and reviewed by SMEs during and following the CEVP workshop. Comments provided by estimate reviewers were addressed and incorporated into a final CEVP estimate. The estimate is organized into 29 discrete packages and a separate programmatic cost component.

The estimate is based on available design documents and reference materials current as of May 2025, with designer input through September 2025. The design of the river crossing bridge and approaches was advanced to a detail sufficient to pursue a PDB contract (approximately 15% to 30% design), and the transit portions were advanced to 30% design in support of the Project Development Phase of the Capital Investment Grant program. Where design information was limited, assumptions were informed by engineering judgment, historical benchmarks, applicable agency standards, and benchmarking against comparable large-scale infrastructure programs.

Unit costs were developed using a variety of sources, including RSMeans 2025 Construction Cost Data, adjusted for local market conditions; recent WSDOT and ODOT bid tabulations; supplier quotes;

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vendor pricing; and historical cost databases for major transit, bridge, and highway improvement projects. Unit costs were developed to reflect the low end of the ranges found in the bid tabs to account for possible savings with economy of scale from the large quantities compared to other area projects from which unit costs were derived.

Allowances have been included in the estimate to account for elements of scope and costs that are not fully defined at this stage of design, consistent with project estimates ranging from Class 3 to Class 5 for different elements of the Program, as defined by the Association for the Advancement of Cost Engineering International (AACE International 2025), meaning a 1% to 30% level of project definition. Construction-based allowances retained in the base estimate include mobilization, construction phasing and sequencing, maintenance of traffic, and miscellaneous items. Such allowances are typically retained in the base estimate in CEVP analyses.

Contingencies totaling **\$3,269 million** were removed from the Program estimate to develop a deterministic base cost estimate for use in the risk analysis. These contingencies included risk-based allowances for market conditions, tariffs, and construction change orders. The removed contingencies were replaced with uncertainty ranges and specific risk items in the probabilistic risk analysis.

The deterministic base estimate is **\$7,812 million** expressed in July 2025 dollars, excluding uncertainty and future cost inflation. Costs are divided by category (PE, ROW, and CN, and program management [PM]) and by contract package. A summary of the deterministic base cost is provided in Table 3-3.

**Table 3-3. Deterministic Base Cost Summary**

| Cost Category   | July 2025 Millions of Dollars |                     |                                   |
|-----------------|-------------------------------|---------------------|-----------------------------------|
|                 | Estimate with Contingency     | Contingency Removed | Base Estimate without Contingency |
| PE              | 1,409                         | 443                 | 966                               |
| ROW             | 386                           | 79                  | 307                               |
| CN              | 8,407                         | 2,563               | 5,845                             |
| PM <sup>a</sup> | 879                           | 184                 | 694                               |
| <b>Total</b>    | <b>11,081</b>                 | <b>3,269</b>        | <b>7,812</b>                      |

<sup>a</sup> The PM cost total includes \$238.2 million spent prior to July 2025. No risk or inflation is applied to this cost in the risk analysis.

### 3.2.2 Base Program Cost Uncertainty

Base uncertainty ranges for unit prices, quantities, and markups were established for major items in the estimate. These ranges are intended to capture estimating uncertainty and variability in the estimate and are separate from risk events documented in the risk register. The uncertainties were assessed in terms of ranges (e.g., 10th to 90th percentile), relative to the deterministic base cost for major cost items.

- Uncertainty ranges for unit prices were individually established for most significant cost items, collectively constituting 66% of the base construction cost. Unit price ranges were established based on independent review of the estimate using the professional judgment of the estimate reviewers. Because unit price ranges for major cost items were adjusted to the low end of the bid tab ranges, the deterministic estimate was generally assessed to represent the 10th percentile value, with the most likely and 90th percentile values being higher than the deterministic base value. A generic range of -10% to +10% was assessed for the remaining cost items. The cost ranges were then mapped to each construction package based on the cost item allocation in the base estimate.
- Uncertainty ranges for quantities were developed for each package based on the level of design development and estimator judgment. Packages with greater design development were assigned lower uncertainty ranges.
- Uncertainty ranges for percentage markups, including construction phasing/interface, maintenance of traffic, delivery method, and miscellaneous items, were established for each package, generally following the ranges documented in the basis of estimate for each category.
- Uncertainty ranges for PE, programmatic costs, and ROW were established by the cost estimating SMEs and discipline leads.
- The cost model recognizes that many cost items are connected to each other, not independent. For example, bridges and retaining walls may appear as separate line items in the estimate, but they are affected by common forces, such as labor costs and equipment rates. When those underlying factors change, multiple items may increase or decrease together. Correlations were included in the model to account for these relationships with the following general assumptions.
  - Correlation among individual unit price ranges was assumed to be high.
  - Correlation for each component range (unit price, quantity, individual markups, PE, and ROW) across packages is assumed to be high.
  - Correlation among component ranges for a given package was assumed to be low.

Table 3-4 summarizes the base cost estimate and includes both the deterministic estimate and the characteristics of the base uncertainty range. Because the uncertainty ranges for certain cost items are asymmetrical relative to the deterministic base, the mean value for the ranged estimate differs from the deterministic value. Thus, the mean value of the ranged base estimate, **\$8,571 million**,

exceeds the deterministic base value of **\$7,812 million** by **\$759 million**. The base uncertainty ranges, along with the risks, contribute to the overall risk-based contingency as described in Section 4.2.

Table 3-4. Base Cost Uncertainty

| Parameter                      | Value (millions of July 2025 dollars) | Difference from Deterministic Base (millions of July 2025 dollars) | Difference from Deterministic Base Estimate (percent) |
|--------------------------------|---------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|
| Deterministic Base Estimate    | 7,812                                 | 0                                                                  | 0.0%                                                  |
| Base Estimate: 10th Percentile | 7,658                                 | -154                                                               | -2.0%                                                 |
| Base Estimate: Mean            | 8,571                                 | 759                                                                | +9.7%                                                 |
| Base Estimate 90th Percentile  | 9,509                                 | 1,697                                                              | +21.7%                                                |

### 3.2.3 Inflation

IBR Program-specific inflation forecasts were developed to inform the 2026 CEVP risk analysis. Inflation forecasts serve two key, interrelated purposes:

- Escalate the base cost estimate from constant (current) dollars to year-of-expenditure (YOE) dollars based on the Program’s delivery schedule.
- Inform the CEVP of risks pertaining to market conditions in developing risk-loaded cost estimates.

The IBR Program-specific inflation forecasts capture several factors: the residual impacts of supply chain disruptions from the COVID-19 pandemic; recent, above-average general cost inflation; the latest economic conditions and outlook impacting global commodity prices; and energy cost impacts in production and transportation of construction materials and equipment.

This report presents the results in three scenarios: “High,” “Low,” and “Probable,” for three cost inflation indices:

- Construction Cost Index (CCI):
  - The CCI provides a composite outlook of construction costs based on five separate cost components, informed by third-party projections, macroeconomic data analysis, and regional trends informed by industry SME interviews.<sup>1</sup> The five separate commodity

<sup>1</sup> The “High” CCI forecast was adjusted to remove more explicit impacts of trade tariffs to avoid duplication with the risk register.

- inflation forecasts weighted in the overall CCI are structural steel, concrete, construction equipment, labor, and other materials and services.
- Right-of-Way Cost Index (ROWI)
    - The ROWI provides an outlook on ROW acquisition costs and related real estate services, such as property appraisals, negotiations, relocations, as well as title and escrow services. The ROWI uses separate econometric forecast models for Multnomah County and Clark County parcel “real market values” (RMVs), paired with Oregon and Washington statewide economic forecasts, including personal income and building permits. The two county-level RMV forecasts, which capture cost increases due to both real estate market conditions and parcel development activities, are combined into a single index.
  - Preliminary Engineering Cost Index (PEI):
    - The PEI provides the costs of the full range of professional services needed to deliver the IBR Program, including PE phase activities, ongoing PM services not embedded within construction contracts, and any other costs not specifically captured in the CCI or PEI. It is based largely on third-party data in which four separate cost index forecasts are combined to yield a raw weighted average index, and like the CCI, is informed by interviews with SMEs from consultant firms and transportation agencies.

In general, the “high” forecasts reflect a strong economy and a tight labor market, combined with a higher inflationary outlook, including the potential effects that additional tariffs and trade policies may have across all economic sectors.

The “low” forecasts reflect a softer economy with slower economic growth and a higher probability for a recessionary period over the forecast horizon, along with a return to lower tariffs and greater availability of labor.

The IBR Probable CCI forecasts and underlying assumptions are intended as a reasonable basis for escalating IBR Program capital cost projections to YOE dollars, whereas the low and high CCI forecasts are provided to inform the construction cost inflation probability distribution considered in the CEVP risk analysis. The PEI, ROWI, and CCI values used in the analysis are summarized in Table 3-5.

Table 3-5. Inflation Assumptions

| Fiscal Year | Preliminary Engineering |              |       | Right of Way |              |       | Construction |              |       |
|-------------|-------------------------|--------------|-------|--------------|--------------|-------|--------------|--------------|-------|
|             | Low                     | Probable     | High  | Low          | Probable     | High  | Low          | Probable     | High  |
| 2025        | -                       | <b>3.26%</b> | -     | -            | <b>2.54%</b> | -     | -            | <b>3.23%</b> | -     |
| 2026        | 3.11%                   | <b>3.72%</b> | 3.94% | -1.20%       | <b>0.30%</b> | 1.55% | 2.98%        | <b>5.20%</b> | 6.25% |
| 2027        | 2.82%                   | <b>3.16%</b> | 3.75% | 2.80%        | <b>4.05%</b> | 6.80% | 2.15%        | <b>2.89%</b> | 3.68% |
| 2028        | 2.60%                   | <b>3.46%</b> | 4.05% | 4.22%        | <b>5.47%</b> | 6.47% | 2.35%        | <b>3.23%</b> | 3.69% |
| 2029        | 2.38%                   | <b>3.46%</b> | 4.15% | 4.03%        | <b>5.28%</b> | 6.28% | 2.24%        | <b>3.29%</b> | 3.71% |
| 2030        | 2.40%                   | <b>3.25%</b> | 4.17% | 4.38%        | <b>5.88%</b> | 6.63% | 2.27%        | <b>3.36%</b> | 3.80% |
| 2031        | 2.39%                   | <b>3.13%</b> | 4.16% | 4.36%        | <b>5.86%</b> | 6.61% | 2.29%        | <b>3.26%</b> | 3.67% |
| 2032        | 2.39%                   | <b>3.01%</b> | 4.16% | 4.16%        | <b>5.66%</b> | 6.41% | 2.41%        | <b>3.20%</b> | 3.62% |
| 2033        | 2.39%                   | <b>3.03%</b> | 4.16% | 3.96%        | <b>5.21%</b> | 6.21% | 2.41%        | <b>3.19%</b> | 3.53% |
| 2034        | 2.35%                   | <b>3.06%</b> | 3.99% | 3.92%        | <b>5.17%</b> | 5.92% | 2.45%        | <b>3.17%</b> | 3.78% |
| 2035        | 2.35%                   | <b>2.94%</b> | 3.97% | 3.42%        | <b>4.42%</b> | 5.67% | 2.44%        | <b>3.22%</b> | 3.86% |
| 2036        | 2.35%                   | <b>2.99%</b> | 4.02% | 3.87%        | <b>4.62%</b> | 5.62% | 2.41%        | <b>3.17%</b> | 3.81% |
| 2037        | 2.35%                   | <b>3.08%</b> | 4.01% | 3.84%        | <b>4.59%</b> | 5.59% | 2.40%        | <b>3.20%</b> | 3.83% |
| 2038        | 2.35%                   | <b>3.06%</b> | 3.99% | 4.12%        | <b>4.87%</b> | 5.87% | 2.42%        | <b>3.22%</b> | 3.83% |

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The low, probable, and high forecasts for each fiscal year were first converted to equivalent calendar year values and programmed into the risk model as annual probability distributions using the beta-PERT distribution form, which is defined by three points including a low (10th percentile), high (90th percentile), and most likely value. High correlation is assumed among the annual distributions such that the low and high forecasts represent uncertainty in multiyear trends rather than uncertainty in values for a given year. Moderate correlation among the PEI, ROWI, and CCI ranges is also assumed.

The base cost estimate was allocated to the base schedule activities to develop a summary-level cost-loaded schedule. Costs were then inflated to the midpoint of each activity per the PEI, ROWI, and CCI forecasts and schedule model (considering potential delays due to risk events).

The deterministic base cost escalated to the base schedule using the probable inflation rates is **\$10,207 million** (prior to inclusion of base uncertainty ranges or risks). The base cost inflation is summarized in Table 3-6.

**Table 3-6. Base Cost Inflation**

| Deterministic Base Cost                                      | Total Cost | PE Cost | ROW Cost | CN Cost | PM Cost |
|--------------------------------------------------------------|------------|---------|----------|---------|---------|
| July 2025<br>(millions of dollars)                           | 7,812      | 966     | 307      | 5,845   | 695     |
| Inflation<br>(millions of dollars)                           | 2,395      | 169     | 54       | 2,004   | 167     |
| Escalated to Year of<br>Expenditure<br>(millions of dollars) | 10,207     | 1,135   | 361      | 7,849   | 862     |

CN = construction; PE = preliminary engineering; PM = program management; ROW = right of way

Additional information about the base cost estimate and risk analysis is provided in Appendix D, including the base uncertainty ranges, correlation assumptions, and flowchart activity allocation.

## 4. RISK ASSESSMENT

### 4.1 Risk Register

Prior to and during the risk workshop, the participants reviewed and developed a risk register for the Program, which included identification and characterization of specific threats and opportunities to the Program cost and schedule (Appendix E). The risk register is organized around specific categories based on the WSDOT Risk Breakdown Structure (RBS). These risks span all aspects of the Program, including construction, design, environmental, ROW, procurement, management, and external interactions. Under each major heading, such as *Construction*, the table lists the identified cost and schedule risks (i.e., threats and opportunities) for the Program. The risks are complementary to the base cost and schedule described in Appendices C and D (including base uncertainty ranges). Therefore, the risk register should be used in conjunction with the base cost and schedule and the key Program assumptions summarized in Section 2-1 and Section 3-1.

The risk register includes some risks that are identified as “minor” because the expected (mean) value of those risks falls below the established threshold screening criteria (see notes in Appendix E). For the Program assessment, the combined effect of the minor risk issues was accounted for using an “aggregated minor risk” item. Similarly, a category of “unidentified risks” attempts to account for any issues that were not explicitly identified by the workshop participants. The same approach was used (separately) for minor and unidentified cost and schedule threats and opportunities.

A total of 486 risks (threats and opportunities) were identified, of which 135 were determined to be significant and 351 were determined to be minor (the remainder either are classified as “watch list” items, were specifically excluded, or have been resolved and retired). Risks were characterized and quantified primarily based on collective professional judgment of the SMEs assembled for the workshop.

The risk register is summarized by RBS category in Table 4-1.

Table 4-1. Summary of Risk Register

| RBS Category                | Number of Significant Risks | Number of Minor Risks | Number of Identified Risks |
|-----------------------------|-----------------------------|-----------------------|----------------------------|
| Construction                | 16                          | 46                    | 62                         |
| Contracting and Procurement | 20                          | 23                    | 43                         |
| Design                      | 12                          | 48                    | 60                         |
| Environmental               | 19                          | 43                    | 62                         |
| Management / Funding        | 12                          | 45                    | 57                         |
| External <sup>a</sup>       | 5                           | 25                    | 30                         |
| Railroad                    | 5                           | 3                     | 8                          |
| Right of Way                | 9                           | 28                    | 37                         |
| Structural and Geotechnical | 9                           | 19                    | 28                         |
| Transit <sup>b</sup>        | 18                          | 45                    | 63                         |
| Utilities                   | 7                           | 25                    | 32                         |
| Other                       | 3                           | 1                     | 4                          |
| <b>Total</b>                | <b>135</b>                  | <b>49</b>             | <b>486</b>                 |

a External is not a category in the WSDOT RBS.

b Transit is not a category in the WSDOT RBS.

RBS = Risk Breakdown Structure; WSDOT = Washington State Department of Transportation

## 4.2 Risk Analysis

The inputs developed in the workshop (including base cost, schedule, risks, and uncertainties) were loaded into a probabilistic, integrated (i.e., cost-loaded schedule) model that incorporated Monte Carlo simulation techniques to generate probability distributions of key performance measures related to cost and schedule, along with prioritized risk rankings. The simulation involved the generation of 10,000 independent potential outcomes and statistical compilation of selected results.

### 4.2.1 Key Results

Probability distributions for Program cost are shown in Figure 4-1 as overlain probability mass functions (PMFs) and cumulative distribution functions (CDFs) in YOY dollars. Figure 4-2 shows the

probability distribution for the program completion date. These probability distributions reflect the base cost and schedule, base uncertainties, and risk and opportunity (as documented in the risk register).

A PMF graphic is useful because it readily portrays the range of values and the most likely value. The most likely value is the value with the highest probability (tallest bar on the plot). (Note: The most likely value is not necessarily the same as the mean or median [50th percentile]). Conversely, a CDF graphic depicts the cumulative probability of not exceeding a particular value (also known as a percentile or, less formally, confidence level). For example, the 70th percentile means that there is a 70% likelihood that the value will be less than or equal to that amount (conversely, there is a 30% likelihood that the value will be greater than that amount).

The corresponding results for Program cost are presented in Tables 4-2 and 4-3 in the form of tabular CDFs. Table 4-2 provides cost results in both July 2025 and YOE dollars, along with base, risk, and escalation cost components. Table 4-3 includes a breakdown of PE, ROW, CN, and programmatic costs. The statistics for key milestone completion dates are provided in Table 4-4. Additional cost and schedule statistical results are provided in Appendix B.

Figure 4-1. Probability Distribution for IBR Program Cost in YOE Dollars

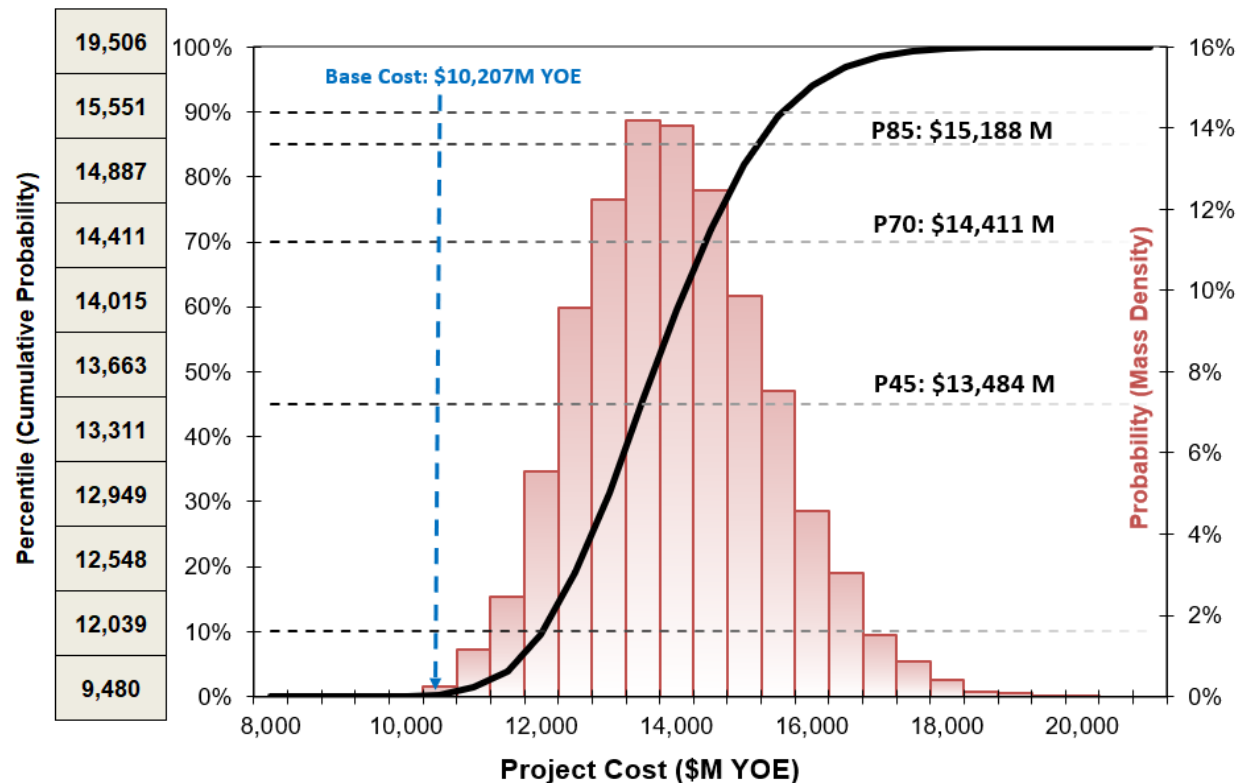
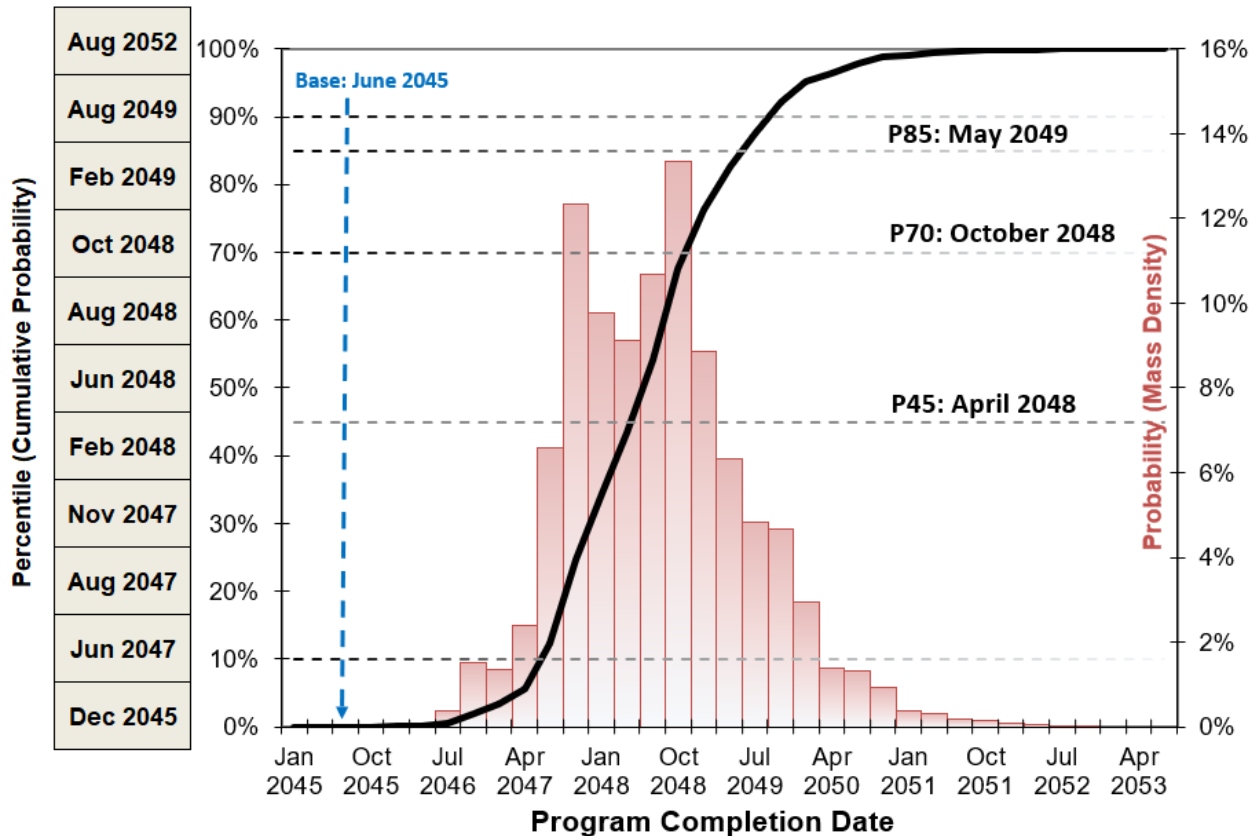


Figure 4-2. Probability Distribution for IBR Program Completion Date



The following notes apply to Table 4-2 through Table 4-4:

1. Table 4-2 and Table 4-3: The *mean* component costs may be added to obtain the *mean* total Program cost. In general, however, the sum of the *x*th percentile for component costs is not the *x*th percentile of the total Program cost. For example, the sum of the 70th percentiles for PE, ROW, and CN (in YOE dollars) *is not* the 70th percentile of the total Program cost (in YOE dollars).
2. Table 4-2 and Table 4-3: “Contingency at P70” represents the percentage difference between the 70th percentile and deterministic base costs (i.e., corresponding to a risk-based contingency at the target amount).
3. Table 4-2 and Table 4-3: The total Program cost includes \$238.2 million of PM cost incurred prior to July 2025.
4. Table 4-4: “Contingency at P70” equals (milestone date at target percentile (P70) – base milestone date) / (base milestone date – schedule reference date as shown on flowchart).
5. Table 4-4: Standard deviation is in calendar months.

Table 4-2. IBR Program Cost Statistics

| Cost Parameter            | Program Cost<br>(July 2025, millions<br>of dollars) | Program Cost<br>(millions of YOE<br>dollars) | Base Cost<br>(July 2025, millions<br>of dollars) | Risk Cost<br>(July 2025, millions<br>of dollars) | Escalation Cost<br>(millions of YOE<br>dollars) |
|---------------------------|-----------------------------------------------------|----------------------------------------------|--------------------------------------------------|--------------------------------------------------|-------------------------------------------------|
| <b>Deterministic Base</b> | <b>7,812</b>                                        | <b>10,207</b>                                | <b>7,812</b>                                     | <b>0</b>                                         | <b>2,396</b>                                    |
| Mean                      | 9,909                                               | 13,738                                       | 8,571                                            | 1,338                                            | 3,829                                           |
| Standard Deviation        | 930                                                 | 1,378                                        | 711                                              | 509                                              | 484                                             |
| 1%                        | 7,956                                               | 10,844                                       | 7,129                                            | 233                                              | 2,847                                           |
| 5%                        | 8,470                                               | 11,623                                       | 7,448                                            | 530                                              | 3,108                                           |
| 10%                       | 8,751                                               | 12,039                                       | 7,658                                            | 691                                              | 3,244                                           |
| 20%                       | 9,103                                               | 12,548                                       | 7,947                                            | 894                                              | 3,416                                           |
| 25%                       | 9,245                                               | 12,766                                       | 8,061                                            | 978                                              | 3,481                                           |
| 30%                       | 9,380                                               | 12,949                                       | 8,160                                            | 1,053                                            | 3,556                                           |
| 40%                       | 9,623                                               | 13,311                                       | 8,351                                            | 1,193                                            | 3,674                                           |
| 45%                       | 9,744                                               | 13,484                                       | 8,449                                            | 1,261                                            | 3,731                                           |
| 50%                       | 9,865                                               | 13,663                                       | 8,546                                            | 1,328                                            | 3,791                                           |
| 60%                       | 10,103                                              | 14,015                                       | 8,735                                            | 1,457                                            | 3,915                                           |
| 65%                       | 10,234                                              | 14,203                                       | 8,834                                            | 1,528                                            | 3,983                                           |
| <b>70%</b>                | <b>10,370</b>                                       | <b>14,411</b>                                | <b>8,945</b>                                     | <b>1,603</b>                                     | <b>4,053</b>                                    |
| 75%                       | 10,517                                              | 14,637                                       | 9,056                                            | 1,684                                            | 4,132                                           |
| 80%                       | 10,684                                              | 14,887                                       | 9,171                                            | 1,778                                            | 4,220                                           |

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| Cost Parameter                | Program Cost<br>(July 2025, millions<br>of dollars) | Program Cost<br>(millions of YOE<br>dollars) | Base Cost<br>(July 2025, millions<br>of dollars) | Risk Cost<br>(July 2025, millions<br>of dollars) | Escalation Cost<br>(millions of YOE<br>dollars) |
|-------------------------------|-----------------------------------------------------|----------------------------------------------|--------------------------------------------------|--------------------------------------------------|-------------------------------------------------|
| 85%                           | 10,890                                              | 15,188                                       | 9,328                                            | 1,875                                            | 4,328                                           |
| 90%                           | 11,136                                              | 15,551                                       | 9,509                                            | 2,008                                            | 4,471                                           |
| 95%                           | 11,517                                              | 16,143                                       | 9,795                                            | 2,194                                            | 4,685                                           |
| 99%                           | 12,255                                              | 17,214                                       | 10,260                                           | 2,567                                            | 5,100                                           |
| <b>Contingency at P70 (%)</b> | <b>32.7%</b>                                        | <b>41.2%</b>                                 | <b>14.5%</b>                                     | -                                                | <b>69.2%</b>                                    |

YOE = year of expenditure

Table 4-3. IBR Program Cost Component Statistics

| Cost Parameter            | PE Cost<br>(millions of YOE dollars) | ROW Cost<br>(millions of YOE dollars) | CN Cost (millions of YOE<br>dollars) | Program Management<br>Cost<br>(millions of YOE dollars) |
|---------------------------|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------------------------|
| <b>Deterministic Base</b> | <b>1,135</b>                         | <b>361</b>                            | <b>7,849</b>                         | <b>862</b>                                              |
| Mean                      | 1,386                                | 401                                   | 10,904                               | 1,047                                                   |
| Standard Deviation        | 108                                  | 48                                    | 1,271                                | 82                                                      |
| 1%                        | 1,168                                | 306                                   | 8,252                                | 883                                                     |
| 5%                        | 1,221                                | 327                                   | 8,945                                | 924                                                     |
| 10%                       | 1,250                                | 340                                   | 9,338                                | 947                                                     |
| 20%                       | 1,292                                | 359                                   | 9,807                                | 978                                                     |
| 25%                       | 1,309                                | 367                                   | 9,994                                | 989                                                     |
| 30%                       | 1,324                                | 374                                   | 10,177                               | 1,001                                                   |

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| Cost Parameter                | PE Cost<br>(millions of YOE dollars) | ROW Cost<br>(millions of YOE dollars) | CN Cost (millions of YOE<br>dollars) | Program Management<br>Cost<br>(millions of YOE dollars) |
|-------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------------------------|
| 40%                           | 1,352                                | 386                                   | 10,513                               | 1,021                                                   |
| 45%                           | 1,365                                | 392                                   | 10,666                               | 1,031                                                   |
| 50%                           | 1,379                                | 398                                   | 10,827                               | 1,041                                                   |
| 60%                           | 1,406                                | 410                                   | 11,163                               | 1,062                                                   |
| 65%                           | 1,421                                | 417                                   | 11,327                               | 1,073                                                   |
| <b>70%</b>                    | <b>1,437</b>                         | <b>424</b>                            | <b>11,525</b>                        | <b>1,085</b>                                            |
| 75%                           | 1,456                                | 432                                   | 11,733                               | 1,099                                                   |
| 80%                           | 1,479                                | 441                                   | 11,972                               | 1,115                                                   |
| 85%                           | 1,503                                | 451                                   | 12,251                               | 1,134                                                   |
| 90%                           | 1,531                                | 465                                   | 12,583                               | 1,157                                                   |
| 95%                           | 1,573                                | 484                                   | 13,122                               | 1,192                                                   |
| 99%                           | 1,659                                | 518                                   | 14,136                               | 1,256                                                   |
| <b>Contingency at P70 (%)</b> | <b>26.6%</b>                         | <b>17.5%</b>                          | <b>46.8%</b>                         | <b>25.9%</b>                                            |

CN = construction; PE = preliminary engineering; ROW = right of way; YOE = year of expenditure

Table 4-4. IBR Program Milestone Statistics

| Schedule Parameter        | Issue ROD       | Pre-completion Tolling Go Live | FTA FFGA        | CRB Start of In-Water Work | New I-5 SB Bridge Complete | Shift I-5 Traffic to New SB Bridge | LRT Revenue Service Date | Interstate Bridge Demo Complete | Program Complete |
|---------------------------|-----------------|--------------------------------|-----------------|----------------------------|----------------------------|------------------------------------|--------------------------|---------------------------------|------------------|
| <b>Deterministic Base</b> | <b>Apr 2026</b> | <b>Apr 2027</b>                | <b>Sep 2028</b> | <b>Mar 2028</b>            | <b>Jul 2032</b>            | <b>Oct 2032</b>                    | <b>Jan 2036</b>          | <b>May 2036</b>                 | <b>Jun 2045</b>  |
| Mean                      | Aug 2026        | Sep 2027                       | Sep 2030        | Jun 2029                   | Aug 2034                   | Feb 2035                           | Jan 2039                 | Apr 2039                        | Jun 2048         |
| Standard Deviation        | 3.4             | 4.9                            | 11.3            | 7.7                        | 10.3                       | 9.7                                | 10.2                     | 10.3                            | 10.6             |
| 1%                        | May 2026        | Apr 2027                       | Dec 2028        | Sep 2028                   | Dec 2032                   | Aug 2033                           | May 2037                 | Jun 2037                        | Aug 2046         |
| 5%                        | May 2026        | Apr 2027                       | Apr 2029        | Sep 2028                   | May 2033                   | Dec 2033                           | Oct 2037                 | Jan 2038                        | Mar 2047         |
| 10%                       | May 2026        | Apr 2027                       | Jun 2029        | Sep 2028                   | Aug 2033                   | Mar 2034                           | Jan 2038                 | Apr 2038                        | Jun 2047         |
| 20%                       | May 2026        | Apr 2027                       | Oct 2029        | Oct 2028                   | Oct 2033                   | Jun 2034                           | Apr 2038                 | Jun 2038                        | Aug 2047         |
| 25%                       | May 2026        | Apr 2027                       | Dec 2029        | Nov 2028                   | Dec 2033                   | Jul 2034                           | Jun 2038                 | Sep 2038                        | Oct 2047         |
| 30%                       | Jun 2026        | Apr 2027                       | Jan 2030        | Dec 2028                   | Jan 2034                   | Aug 2034                           | Jul 2038                 | Oct 2038                        | Nov 2047         |
| 40%                       | Jun 2026        | Jun 2027                       | May 2030        | Jan 2029                   | Apr 2034                   | Oct 2034                           | Oct 2038                 | Dec 2038                        | Feb 2048         |
| 45%                       | Jun 2026        | Jul 2027                       | Jul 2030        | Mar 2029                   | May 2034                   | Nov 2034                           | Nov 2038                 | Feb 2039                        | Apr 2048         |
| 50%                       | Jun 2026        | Aug 2027                       | Aug 2030        | Apr 2029                   | Jul 2034                   | Jan 2035                           | Dec 2038                 | Mar 2039                        | Jun 2048         |
| 60%                       | Jul 2026        | Oct 2027                       | Dec 2030        | Sep 2029                   | Sep 2034                   | Mar 2035                           | Mar 2039                 | Apr 2039                        | Aug 2048         |
| 65%                       | Aug 2026        | Oct 2027                       | Feb 2031        | Sep 2029                   | Oct 2034                   | Apr 2035                           | Apr 2039                 | May 2039                        | Sep 2048         |
| <b>70%</b>                | <b>Aug 2026</b> | <b>Nov 2027</b>                | <b>Apr 2031</b> | <b>Sep 2029</b>            | <b>Dec 2034</b>            | <b>Jun 2035</b>                    | <b>Jun 2039</b>          | <b>Sep 2039</b>                 | <b>Oct 2048</b>  |

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| Schedule Parameter            | Issue ROD    | Pre-completion Tolling Go Live | FTA FFGA     | CRB Start of In-Water Work | New I-5 SB Bridge Complete | Shift I-5 Traffic to New SB Bridge | LRT Revenue Service Date | Interstate Bridge Demo Complete | Program Complete |
|-------------------------------|--------------|--------------------------------|--------------|----------------------------|----------------------------|------------------------------------|--------------------------|---------------------------------|------------------|
| 75%                           | Sep 2026     | Dec 2027                       | Jun 2031     | Sep 2029                   | Feb 2035                   | Aug 2035                           | Jul 2039                 | Nov 2039                        | Dec 2048         |
| 80%                           | Oct 2026     | Jan 2028                       | Jul 2031     | Nov 2029                   | Apr 2035                   | Sep 2035                           | Sep 2039                 | Dec 2039                        | Feb 2049         |
| 85%                           | Nov 2026     | Mar 2028                       | Oct 2031     | Dec 2029                   | Jul 2035                   | Dec 2035                           | Nov 2039                 | Feb 2040                        | May 2049         |
| 90%                           | Dec 2026     | Apr 2028                       | Dec 2031     | Mar 2030                   | Oct 2035                   | Mar 2036                           | Feb 2040                 | Apr 2040                        | Aug 2049         |
| 95%                           | Mar 2027     | Jun 2028                       | Apr 2032     | Sep 2030                   | Mar 2036                   | Aug 2036                           | Jul 2040                 | Nov 2040                        | Dec 2049         |
| 99%                           | Aug 2027     | Oct 2028                       | Nov 2032     | Mar 2031                   | Jan 2037                   | Jun 2037                           | Jun 2041                 | Oct 2041                        | Nov 2050         |
| <b>Contingency at P70 (%)</b> | <b>50.4%</b> | <b>33.7%</b>                   | <b>81.0%</b> | <b>55.8%</b>               | <b>34.6%</b>               | <b>36.6%</b>                       | <b>32.7%</b>             | <b>30.7%</b>                    | <b>16.7%</b>     |

CRB = Columbia River Bridge; FTA = Federal Transit Administration; FFGA = Full Funding Grant Agreement; I-5 = Interstate 5; LRT = light-rail transit; ROD = record of decision; SB = southbound

## 4.2.2 Contingency

The IBR Program has selected the 70th percentile (P70) YOE cost as a budgetary target, consistent with FHWA guidelines for major projects (FHWA 2007). A corresponding Program contingency can be determined by subtracting the deterministic base YOE cost from the P70 YOE cost. Based on this Program risk analysis, the Program contingency at P70 equals **\$4,203 million**, or 41.2% of the deterministic base cost. The IBR Program will refine this contingency through future evaluations of Program phasing and sequencing options.

The major components contributing to the contingency amount are summarized in Table 4-5, including base uncertainty, market conditions, and other risk register events. This indicates that risk register events (including the inflationary and indirect impact of schedule delay risks) warrant a contingency worth 17.7% of the base YOE cost, with market conditions and base uncertainty comprising the remainder of the contingency amount.

Table 4-5. Components of Program Contingency

| Component            | Amount (millions of YOE dollars) | % of Contingency | % of Base YOE Cost |
|----------------------|----------------------------------|------------------|--------------------|
| Base Uncertainty     | 1,562                            | 37.2%            | 15.3%              |
| Market Conditions    | 831                              | 19.8%            | 8.1%               |
| Risk Register Events | 1,810                            | 43.1%            | 17.7%              |
| <b>Total</b>         | <b>4,203</b>                     | <b>100.0%</b>    | <b>41.2%</b>       |

## 4.2.3 Sensitivity Analysis

The most significant cost risk and uncertainty factors are presented graphically in Figures 4-3 and 4-4, respectively. Each figure is ranked in terms of contribution to the mean absolute value impact to project cost in July 2025 dollars. The most significant threats and opportunities regarding the schedule are presented in Figure 4-5, ranked in terms of contribution to the approximate absolute value mean impact to the critical path of key program milestones, in calendar months.

The rankings in Figures 4-3 through 4-5 also provide an indication of the range of potential impact for each risk or base uncertainty item. Each bar depicts the 95% simulated impact range (percentile 2.5 to percentile 97.5) for each factor. The simulated impact ranges consider both the likelihood of occurrence and any uncertainty in impacts if the risk occurs.

Additional notes on risk rankings:

1. The schedule risk rankings are approximate but take into consideration the interaction with other risks and flowchart logic, including base float, potentially changing critical paths, and work windows as applicable.
2. Some similar risk register items were combined in the rankings for clarity.
3. The cost uncertainty impacts represent the approximate impact on Program costs considering the compounding effect of percentage markups applied to the direct cost items.

Figure 4-3. Most Significant Program Cost Threats and Opportunities

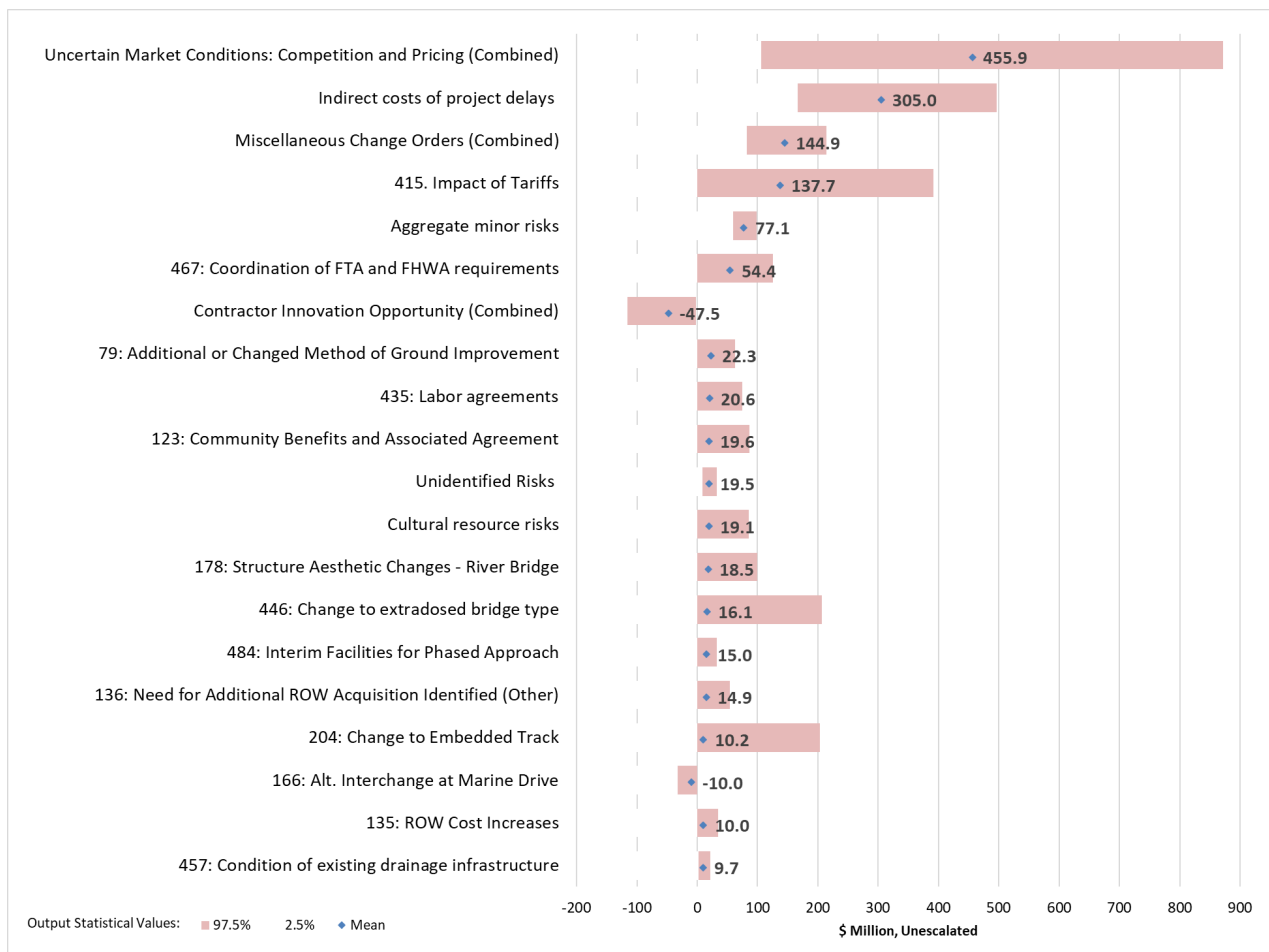


Figure 4-4. Most Significant Program Base Cost Uncertainties

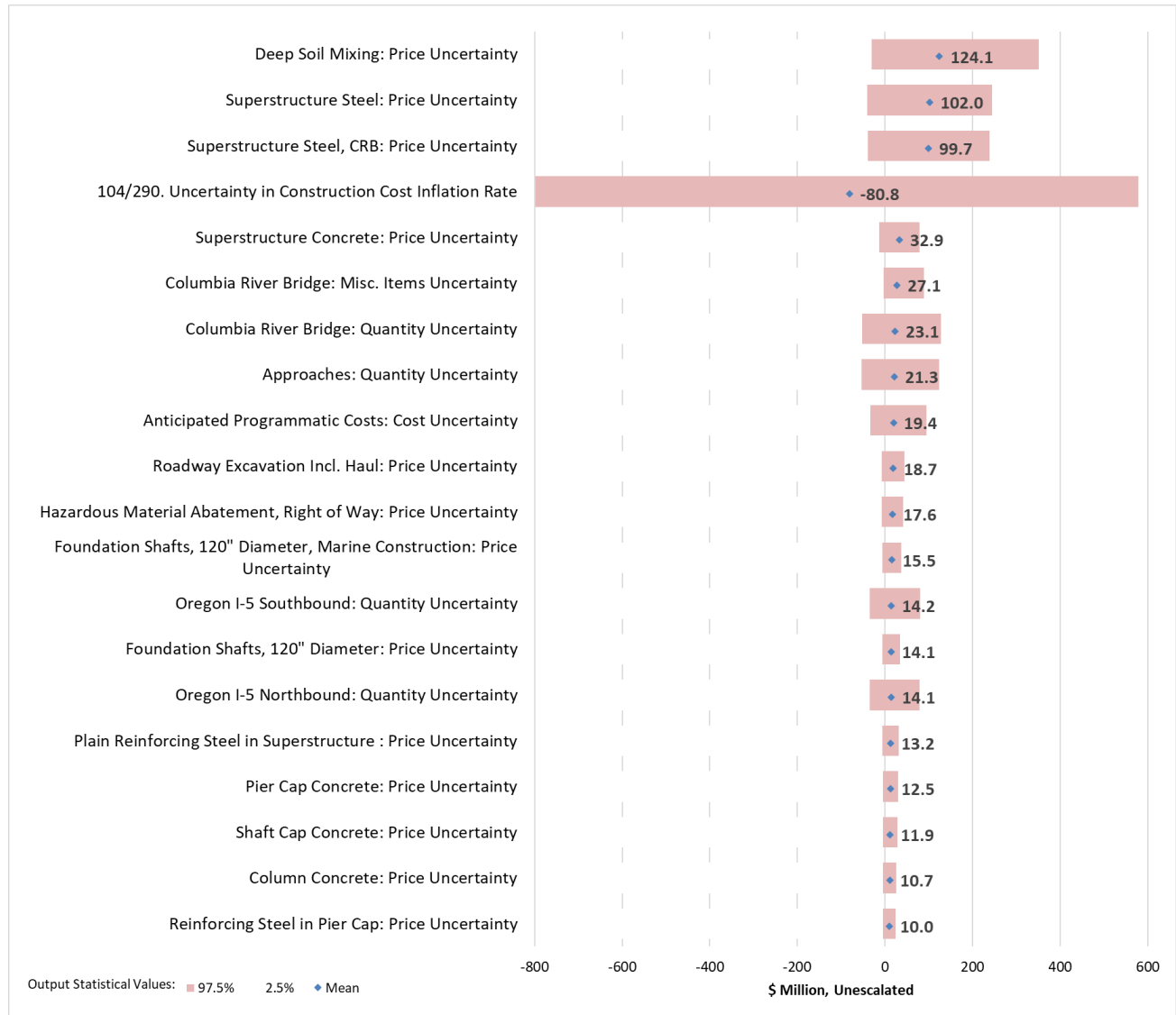
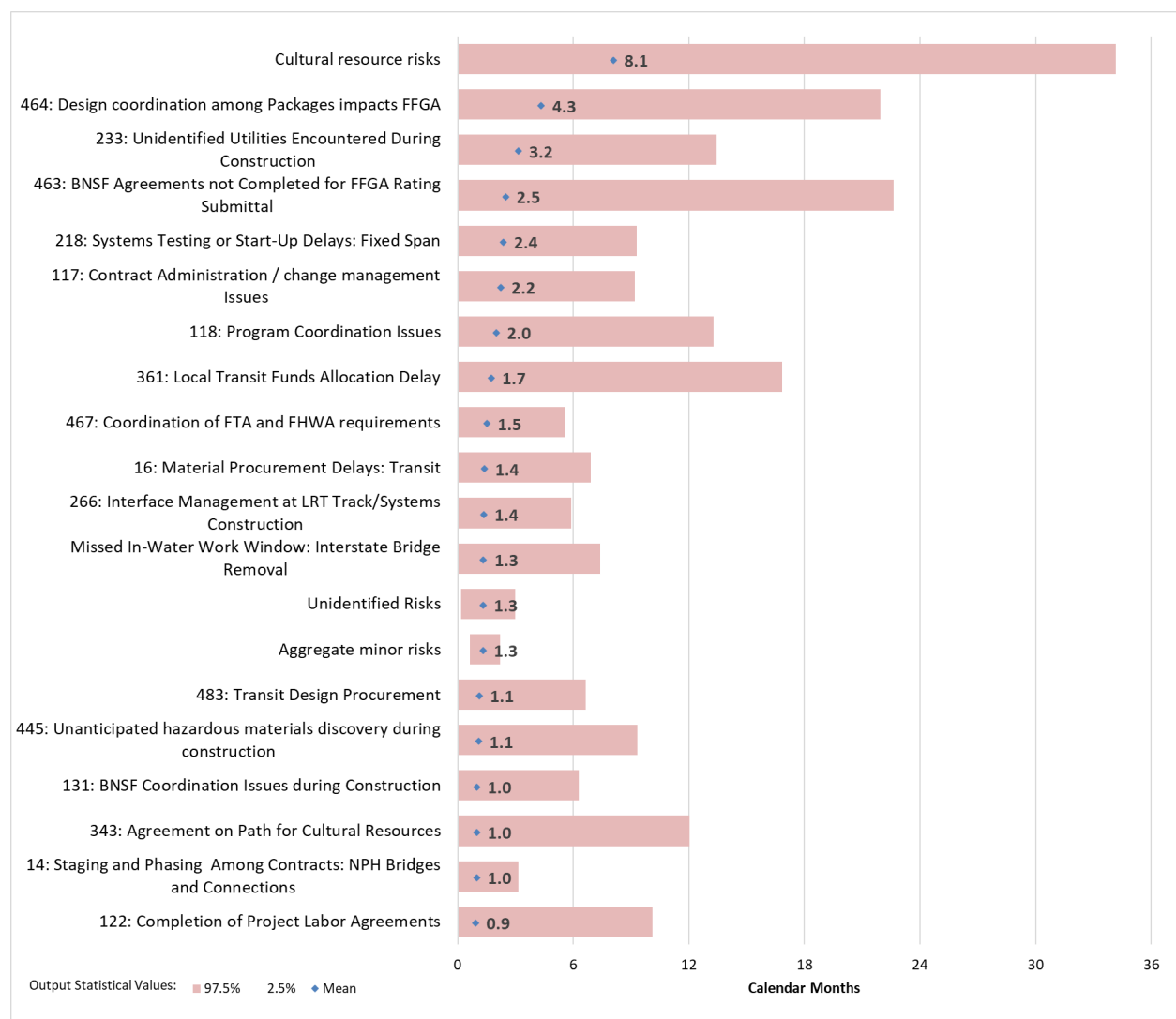


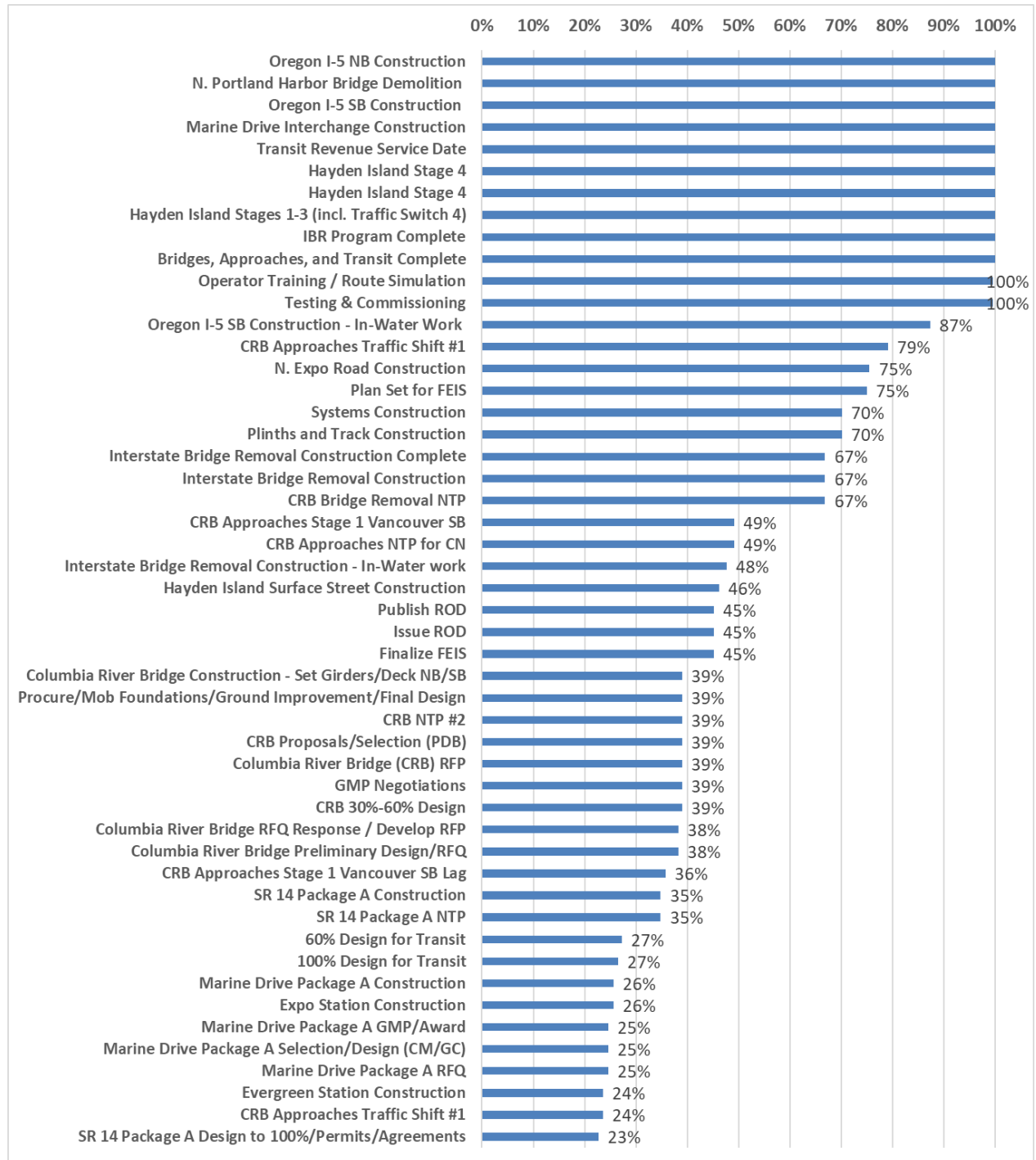
Figure 4-5. Most Significant Program Schedule Threats and Opportunities



## 4.2.4 Schedule Critical Path Analysis

Figure 4-6 summarizes the results of the schedule analysis, including the probability that each major activity or milestone is on the overall critical path to the completion of one or more key Program milestones (Program complete, LRT revenue service date, and/or Interstate Bridge demolition complete). For example, the milestone “Publish ROD” falls on the critical path to one or more of these milestones on 45% of the Monte Carlo realizations performed. Note that some activities/milestones may be co-critical on some realizations.

Figure 4-6. Probability of Key Activities and Milestones Being on Program Critical Path



## 4.2.5 Movable-Span Scenario

A separate scenario was analyzed in the CEVP corresponding to a movable-span option for CRB. A separate cost estimate and separate schedule were developed for this option and differences in risks were assessed during the workshop. The movable-span option includes a movable lift span and lift towers on each of the northbound and southbound bridges. The lift span would be placed over the primary Columbia River navigation channel. The lift span and towers would provide a minimum of 178 feet of vertical clearance when raised and would meet USCG navigation standards.

The deterministic base estimate for the movable-span option is **\$8,392 million** expressed in July 2025 dollars, excluding uncertainty and future cost inflation (Table 4-6). This estimate is **\$580 million** higher than the fixed-span option.

Table 4-6. Deterministic Base Cost Summary: Movable-Span Option

| Cost Category   | July 2025 Millions of Dollars |                     |                                   |
|-----------------|-------------------------------|---------------------|-----------------------------------|
|                 | Estimate with Contingency     | Contingency Removed | Base Estimate without Contingency |
| PE              | 1,511                         | 478                 | 1,033                             |
| ROW             | 386                           | 79                  | 307                               |
| CN              | 9,225                         | 2,868               | 6,357                             |
| PM <sup>a</sup> | 879                           | 184                 | 694                               |
| <b>Total</b>    | <b>12,001</b>                 | <b>3,609</b>        | <b>8,392</b>                      |

<sup>a</sup> The PM cost total includes \$238.2 million spent prior to July 2025. No risk or inflation is applied to this cost in the risk analysis.

CN = construction; PE = preliminary engineering; PM = program management; ROW = right of way

The Program base schedule was adjusted for the movable-span option as follows:

- The CRB package base preliminary design duration was increased by six months to account for additional time needed to issue a request for qualifications (RFQ) for this option.
- The base design duration for the CRB package was increased by six months to reflect additional time needed for the PDB contractor to design the more complex lift span.
- The CRB base construction duration was increased by 16 months to reflect additional time needed to construct the lift span.

With these changes, the base Program completion date for the movable-span option is **June 2047**, or **24 months** later than the fixed-span option. The CRB package has two months of float in the base

## Cost Estimate Validation Process (CEVP) Report

program schedule (Appendix C); thus, the net Program delay does not exactly reflect the sum of the activity base duration increases.

The risk register was reviewed for the movable-span option and modifications were made based on the judgment of the SMEs in the workshop. Some new risks were added, and the risk probability and/or impacts were adjusted for selected risks for this scenario.

Figure 4-7 and Figure 4-8 compare the YOE cost and Program completion schedule results for the fixed-span and movable-span options. The movable-span option is projected to cost **\$16,139 million** at the 70th percentile, or an additional **\$1,728 million** compared to the fixed-span option. The 70th percentile Program completion date for the movable-span option is **October 2050**, or an additional **24 months** compared to the fixed-span option.

Figure 4-7. Comparison of Program Cost Results for Movable-Span Option

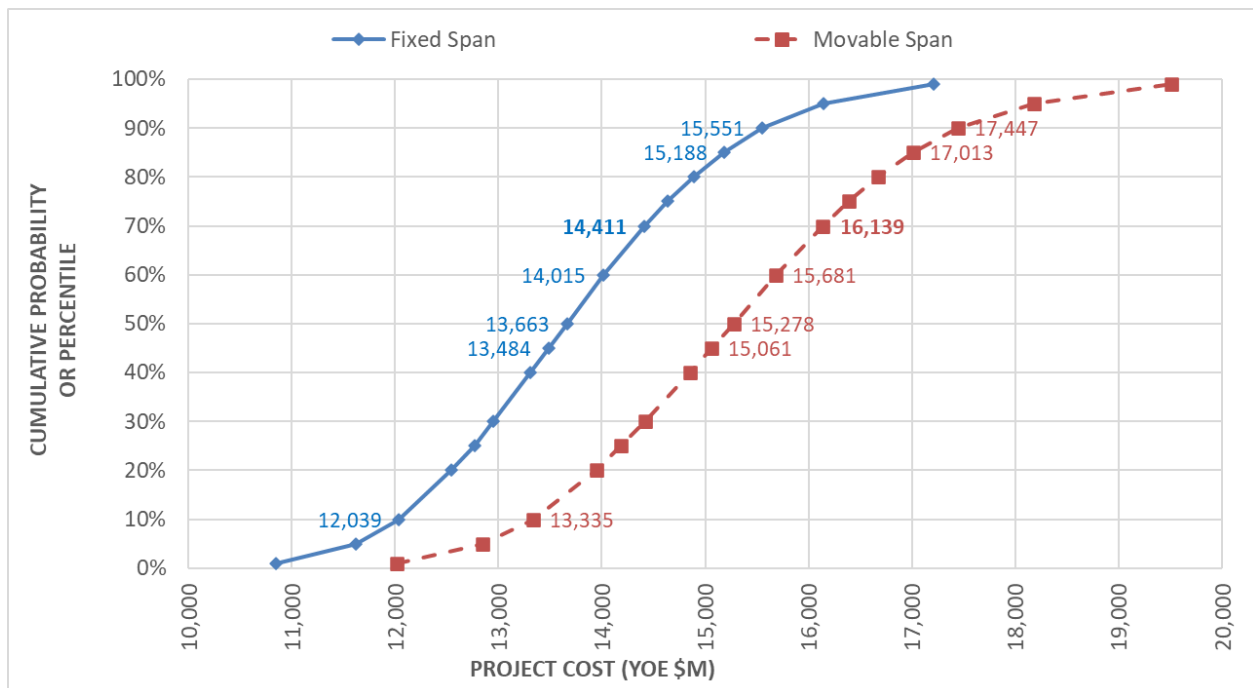
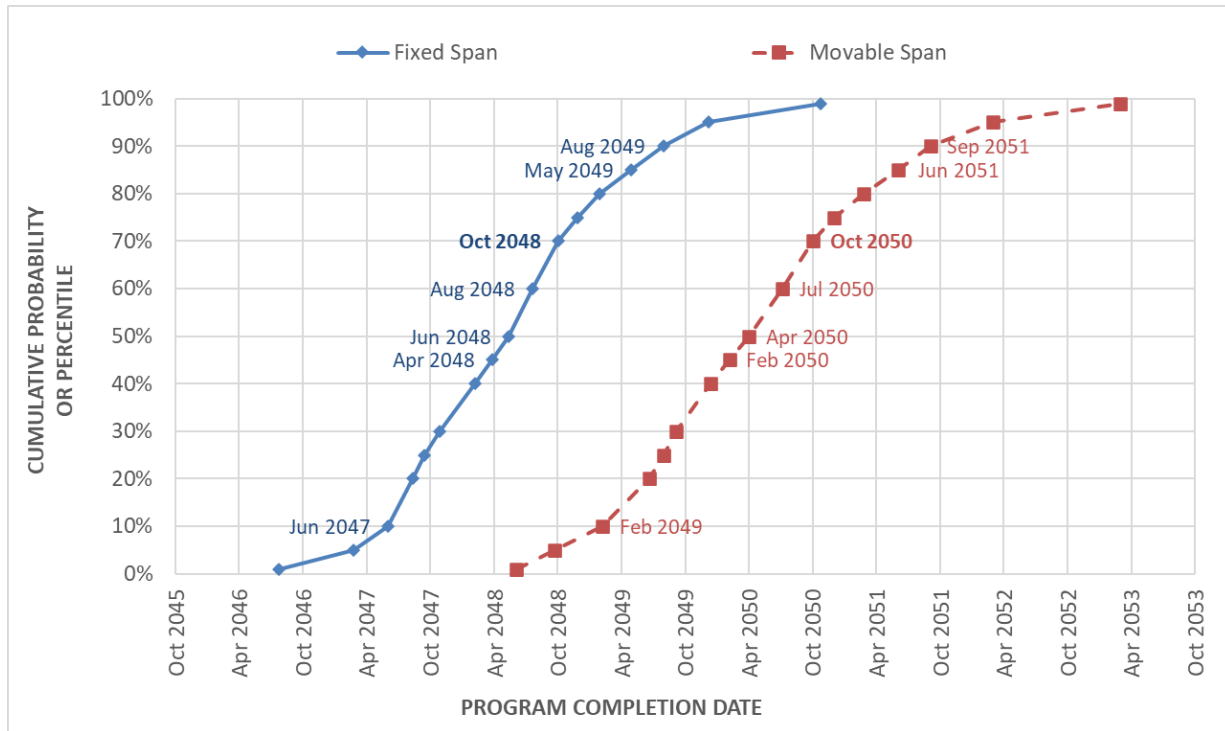


Figure 4-8. Comparison of Program Schedule Results for Movable-Span Option



Similar to the fixed-span scenario, the movable-span scenario includes the following key Program cost risks:

- Uncertain market conditions: competition and pricing
- Indirect cost of Program delay
- Miscellaneous change orders following award of construction contracts
- Impact of tariffs
- Coordination of technical provisions and administrative requirements for both FTA and FHWA

Key Program estimating uncertainties (related to base cost) for this scenario include the following:

- Price uncertainty: deep soil mixing
- Price uncertainty: superstructure steel (marine and upland)
- Uncertainty in the construction cost inflation rate
- Price uncertainty: superstructure concrete
- Quantity uncertainty: Columbia River Bridge

Key schedule risks to key Program milestones for the movable-span scenario include the following:

- Cultural resource risks

## Cost Estimate Validation Process (CEVP) Report

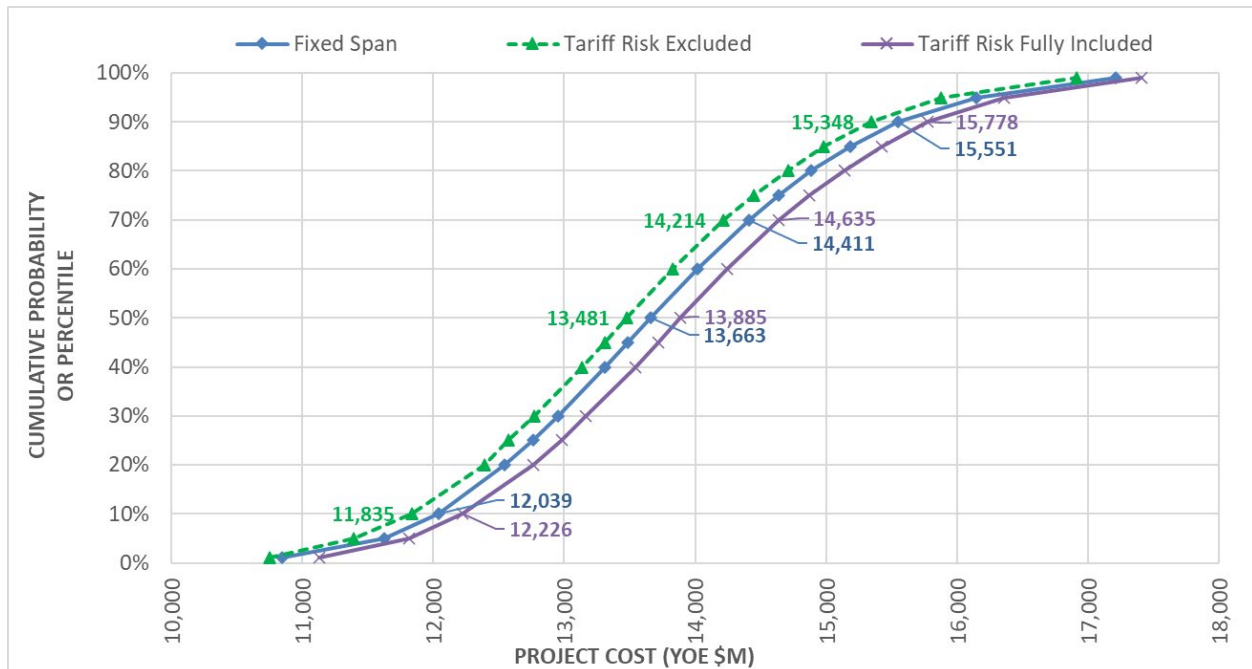
- Guaranteed maximum price negotiation delays: CRB package
- Systems testing or start-up delays
- Missed in-water work window: Oregon southbound package construction
- Owner agency coordination following movable-span PNCD

### 4.2.6 Tariff Scenarios

Figure 4-9 compares Program cost results for the tariff scenarios described in Section 2.3. The difference in Program cost between the scenarios is summarized below. Tariffs are assumed to have no impact on Program schedule. Tariff impacts are addressed as a risk with 50% probability in the base model run for the fixed-span option.

- Program cost at P70 is reduced by **\$196.8 million** with future tariff impacts excluded.
- Program cost at P70 is increased by **\$224.2 million** with future tariff impacts fully included.

Figure 4-9. Comparison of Program Cost Results for Tariff Scenarios



## 5. RISK MANAGEMENT

The IBR Program will continue to engage in active risk management to minimize the threats to the Program and maximize its opportunities. Continuing to use the risk management process to identify, analyze, respond to, monitor, and control risk will support effective program management and provide a source of information for action in the proper handling of risk effects. If action to manage risk is not taken and decisions are not made in a timely fashion, the impacts of the risks may be incurred, particularly in the form of schedule delays; however, if the necessary risk response strategies and action plans are proactively deployed, the impacts of the associated risks can be minimized to the extent feasible.

Risk management is a collaborative, continuous, and cyclical process that requires input from key program partners. Future risk management activities will include continued focus on risks with the highest relative risk severity identified and monitoring of the risks at consistent intervals. Should risks begin to materialize, execution of risk response strategies as early as possible is imperative. The Program team should also monitor for the emergence of new risks and identify and evaluate potential impacts and appropriate response mechanisms as documented in the Program's risk register. It is important to clarify that this phase is continued throughout Program implementation so that each project risk is managed until it can be retired or until the Program completes.

To facilitate the continuous application of proactive risk response planning, the IBR Program technical leads will provide frequent risk register updates and the IBR Program team will meet, at a minimum, on a quarterly basis to review and update the risks and action plans. Routine risk monitoring and control will ensure timely decision-making and aid in the continued acknowledgment of uncertainties that may significantly impact the Program's progression and cost.

## 6. REFERENCES

AACE International (Advancement of Cost Engineering International). 2025. Cost Estimate Classification System (Recommended Practice 17R-97), Ed. Rev. February 17, 2025. Available at <<https://web.aacei.org/docs/default-source/rps/17R-97.pdf>>. Accessed February 3, 2026.

FHWA (Federal Highway Administration). 2007. Major Projects Estimating Guidance. Available at <[https://www.fhwa.dot.gov/majorprojects/cost\\_estimating/major\\_project\\_cost\\_guidance.pdf](https://www.fhwa.dot.gov/majorprojects/cost_estimating/major_project_cost_guidance.pdf)>. Accessed January 28, 2026.

WSDOT (Washington State Department of Transportation). 2018. Project Risk Management Guide. Available at <<https://wsdot.wa.gov/publications/fulltext/CEVP/ProjectRiskManagementGuide.pdf>> Accessed January 28, 2026.

## Appendix A – Workshop Agenda and Participation



# CEVP® WORKSHOP AGENDA

## Interstate Bridge Replacement Program

August 18-22, 2025

**In-Person Participation:**

IBR Office Large Conference Room

IBR Office 500 Broadway Suite 200 Vancouver WA 98660

**Virtual Participation:**

Microsoft Teams

**Workshop Objectives:**

1. Establish collective understanding among participants of the CEVP® Process.
2. Describe Project scope, characteristics, and key assumptions/exclusions.
3. Validate schedule flow-chart logic and base activity durations.
4. Validate base cost estimates and quantify estimating uncertainties.
5. Develop comprehensive and non-overlapping project risk register and quantify all significant risks.

**NOTE:** Sequence and durations of agenda items in the workshop process may vary somewhat from those planned.

Participants: Core attendees (or representatives) attend all sessions. Other participants attend sessions as noted on agenda.

**Core Attendees (attend for the duration):**

**CEVP Risk Lead/Facilitator:** Alan Keizur

**CEVP Risk Modeler/Assistant:** Victor Brinic

**IBR Program Leadership (WSDOT):** Casey Liles or designee

**IBR Program Leadership (ODOT):** Shilpa Mallem or designee

**IBR Design and Construction:** Cesar Lopez, Nathan Potter, Ken Stockett

**IBR Program Leadership (TriMet):** Jeb Doran or designee

**IBR Program Leadership (Program Manager):** Christina Martinez or designee, Daryl Wendle, Michael Oborn, Amanda Ishikawa

**IBR Risk Management:** Greg Brink, Kelly Martin, Ana Toupik

**IBR Cost Estimate:** Alex Mannion, Mathers Heuck, Ashraf Aly

**IBR Schedule:** Greg Kolb

| Date/Time                              | Topic                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Leading                                    | Additional Participants |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------|
| <b>Day 1 – Monday, August 18, 2025</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                            |                         |
| 8:00 am                                | <b>Kickoff/Introduction</b> <ul style="list-style-type: none"> <li>▪ Welcome, Sign-in, Introductions</li> <li>▪ Safety Orientation</li> <li>▪ Agenda review</li> <li>▪ Brief CEVP/CRA process overview</li> </ul>                                                                                                                                                                                                                                                                | Program Leadership / Risk Lead             | All                     |
| 8:30 am                                | <b>Project Key Assumptions</b> <ul style="list-style-type: none"> <li>▪ Packaging and delivery assumptions</li> <li>▪ Key project assumptions in the base cost and schedule</li> <li>▪ Scenarios and exclusions</li> </ul>                                                                                                                                                                                                                                                       | Project Team                               | All                     |
| 9:15 am                                | <b>Base Schedule / Flowchart Overview</b> <ul style="list-style-type: none"> <li>▪ Presentation of summary schedule</li> <li>▪ Summary of pre-workshop schedule working session outcomes</li> </ul>                                                                                                                                                                                                                                                                              | Risk Lead<br>Schedule SMEs<br>Project Team | All                     |
| 10:00 am                               | <b>BREAK</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                            |                         |
| 10:15 am                               | <b>Base Cost Overview</b> <ul style="list-style-type: none"> <li>▪ Overview of cost estimate basis/structure</li> <li>▪ Base cost uncertainty ranges</li> <li>▪ Summary of pre-workshop cost working session outcomes</li> </ul>                                                                                                                                                                                                                                                 | Risk Lead<br>Cost SMEs<br>Project Team     | All                     |
| 11:00 am                               | <b>Risk Brainstorming by Project Element</b> <ul style="list-style-type: none"> <li>▪ Interdisciplinary brainstorm identification of the most significant risks for each major program element <ul style="list-style-type: none"> <li>○ River Bridge <ul style="list-style-type: none"> <li>▪ Fixed span scenario</li> <li>▪ Movable span scenario</li> </ul> </li> <li>○ Critical Roadway Packages (Approaches/SR 14/Hayden Island A)</li> <li>○ Transit</li> </ul> </li> </ul> | Risk Lead                                  | All                     |
| 12:00- 1:00                            | <b>LUNCH</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                            |                         |
| Remainder of Workshop                  | <b>Begin discipline-specific cost/risk reviews</b> <ul style="list-style-type: none"> <li>• Review/validate any remaining discipline-specific cost items</li> <li>• Identify discipline-specific risks</li> <li>• Quantify risks determined to exceed significance threshold</li> </ul>                                                                                                                                                                                          | Risk Lead                                  | See below               |

| Date/Time                               | Topic                                                                                                                                                                                                                                                     | Leading   | Additional Participants                                 |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------|
| 1:00 pm                                 | <b>Environmental</b> <ul style="list-style-type: none"> <li>▪ NEPA/ESA/Environmental Justice</li> <li>▪ Environmental Mitigation</li> <li>▪ Section 4(f)</li> <li>▪ Section 106</li> <li>▪ Hazardous materials</li> <li>▪ etc.</li> </ul>                 | Risk Lead | Core Team, Environmental SMEs, Tribal Coordination SMEs |
| 3:00 pm                                 | <b>BREAK</b>                                                                                                                                                                                                                                              |           |                                                         |
| 3:15 pm                                 | <b>Permitting</b> <ul style="list-style-type: none"> <li>▪ USACE, USGC Permits (with emphasis on fixed span concept)</li> <li>▪ Other Key Permits (e.g., bridge demo)</li> </ul>                                                                          | Risk Lead | Core Team, Environmental SMEs, Permitting SMEs          |
| 4:15 pm                                 | <b>Civil/Drainage Design: Roadway/Transit</b> <ul style="list-style-type: none"> <li>▪ Hydraulic/Stormwater Design</li> <li>▪ Flow Control / Water Quality</li> </ul>                                                                                     | Risk Lead | Core Team, Hydraulic Design SMEs                        |
| 4:55 pm                                 | <b>Daily wrap-up</b> <ul style="list-style-type: none"> <li>▪ Additional information</li> <li>▪ Clarifications</li> <li>▪ Improvements</li> <li>▪ Tomorrow's plan</li> </ul>                                                                              | Risk Lead | Core Team                                               |
| 5:00 pm                                 | <b>ADJOURN</b>                                                                                                                                                                                                                                            |           |                                                         |
| <b>Day 2 – Tuesday, August 19, 2025</b> |                                                                                                                                                                                                                                                           |           |                                                         |
| 8:00 am                                 | <b>Roadway/Traffic Design</b> <ul style="list-style-type: none"> <li>▪ Roadway/geometric, interchange design</li> <li>▪ Deviations, exceptions, approvals</li> <li>▪ Traffic Design (TDM, ITS, ATMS, etc.)</li> <li>▪ Traffic Design (Tolling)</li> </ul> | Risk Lead | Core Team, Roadway Design SMEs, Traffic Design SMEs     |
| 10:00 am                                | <b>BREAK</b>                                                                                                                                                                                                                                              |           |                                                         |
| 10:15 am                                | <b>Right of Way: Roadway/Transit</b> <ul style="list-style-type: none"> <li>▪ ROW Plans</li> <li>▪ Access management</li> <li>▪ Appraisals &amp; Acquisitions</li> </ul>                                                                                  | Risk Lead | Core Team, ROW SMEs                                     |
| 12:00 – 1:00                            | <b>LUNCH</b>                                                                                                                                                                                                                                              |           |                                                         |

| Date/Time                                 | Topic                                                                                                                                                                                                                                      | Leading   | Additional Participants                                                                                               |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------|
| 1:00 pm                                   | <b>Structural/Geotechnical Risk Review: Roadway/Transit</b> <ul style="list-style-type: none"> <li>▪ Bridge substructure &amp; superstructure design</li> <li>▪ Retaining Walls</li> <li>▪ Ground conditions</li> </ul>                    | Risk Lead | Core Team, Structural SMEs, Geotechnical SMEs, Cultural Resources SMEs                                                |
| 2:45 pm                                   | <b>BREAK</b>                                                                                                                                                                                                                               |           |                                                                                                                       |
| 3:00 pm                                   | <b>Movable Span Option: Interdisciplinary Risk Discussion</b> <ul style="list-style-type: none"> <li>▪ Risks specific to the movable span option</li> <li>▪ Increases or decreases to other project risks</li> </ul>                       | Risk Lead | Core Team, Selected SMEs (structural, geotechnical, environmental, utility, public affairs, transit operations, etc.) |
| 4:55 pm                                   | <b>Daily wrap-up</b> <ul style="list-style-type: none"> <li>▪ Additional information</li> <li>▪ Clarifications</li> <li>▪ Improvements</li> <li>▪ Tomorrow's plan</li> </ul>                                                               | Risk Lead | Core Team                                                                                                             |
| 5:00 pm                                   | <b>ADJOURN</b>                                                                                                                                                                                                                             |           |                                                                                                                       |
| <b>Day 3 – Wednesday, August 20, 2025</b> |                                                                                                                                                                                                                                            |           |                                                                                                                       |
| 8:00 am                                   | <b>Utilities: Roadway/Transit</b> <ul style="list-style-type: none"> <li>▪ Utility agreements</li> <li>▪ Utility Relocations</li> <li>▪ Unidentified utilities</li> </ul>                                                                  | Risk Lead | Core Team, Utility SMEs, Construction SMEs                                                                            |
| 9:15 am                                   | <b>Railroad: Roadway/Transit</b> <ul style="list-style-type: none"> <li>▪ Railroad agreements</li> <li>▪ Railroad coordination during construction</li> </ul>                                                                              | Risk Lead | Core Team, Railroad SMEs, Construction SMEs                                                                           |
| 10:00 am                                  | <b>BREAK</b>                                                                                                                                                                                                                               |           |                                                                                                                       |
| 10:15 am                                  | <b>Public Involvement, Public Affairs, Local Agency Agreements</b> <ul style="list-style-type: none"> <li>▪ Public Involvement</li> <li>▪ Public Affairs</li> <li>▪ Interagency coordination</li> <li>▪ Local agency agreements</li> </ul> | Risk Lead | Core Team, Public Involvement, Public Affairs SMEs, Program Leadership                                                |
| 12:00 – 1:00                              | <b>LUNCH</b>                                                                                                                                                                                                                               |           |                                                                                                                       |

| Date/Time                                | Topic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Leading   | Additional Participants                                                                                                                 |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 1:00 pm                                  | <b>Contract Procurement / Delivery Method / Market Conditions</b> <ul style="list-style-type: none"> <li>▪ Inflation/Escalation and Market Conditions</li> <li>▪ Delivery methods</li> <li>▪ Contracting and packaging</li> <li>▪ Procurement</li> <li>▪ CWA/PLA</li> <li>▪ TERO</li> </ul>                                                                                                                                                                                                | Risk Lead | Core Team, Finance SMEs, Program Leadership, Contracting SMEs, Civil Rights/Tribal SMEs                                                 |
| 2:45 pm                                  | <b>BREAK</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |                                                                                                                                         |
| 3:00 pm                                  | <b>Columbia River Bridge Contract</b> <ul style="list-style-type: none"> <li>▪ Progressive Design-Build Contracting</li> <li>▪ Interdisciplinary review/discussion of key preconstruction and construction risks specific to the CRB contract</li> </ul>                                                                                                                                                                                                                                   | Risk Lead | Core Team, Program Leadership, Contracting SMEs, Selected SMEs (Environmental, ROW, Utilities, Structures, Roadway, Construction, etc.) |
| 4:55 pm                                  | <b>Daily wrap-up</b> <ul style="list-style-type: none"> <li>▪ Additional information</li> <li>▪ Clarifications</li> <li>▪ Improvements</li> <li>▪ Tomorrow's plan</li> </ul>                                                                                                                                                                                                                                                                                                               | Risk Lead | Core Team                                                                                                                               |
| 5:00 pm                                  | <b>ADJOURN</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                                                                                                         |
| <b>Day 4 – Thursday, August 21, 2025</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |                                                                                                                                         |
| 8:00 am                                  | <b>Transit: Track, Stations, and Systems</b> <ul style="list-style-type: none"> <li>▪ SCC 10 (Guideway and Track) cost elements and associated risks</li> <li>▪ SCC 20 (Stations, Intermodal) cost elements and associated risks</li> <li>▪ SCC 50 (Systems) cost elements and associated risks: train control, signals, traction power, communications, central control, etc.</li> <li>▪ Express Bus-on-Shoulder</li> <li>▪ Express Bus Transit Centers and Support Facilities</li> </ul> | Risk Lead | Core Team, Transit SMEs, Civil SMEs, Structural/Geotechnical SMEs                                                                       |
| 10:15 am                                 | <b>BREAK</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |                                                                                                                                         |

| Date/Time                              | Topic                                                                                                                                                                                                                                                                                                                                           | Leading   | Additional Participants                                       |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------|
| 10:30 am                               | <b>Transit: Vehicles and Support Facilities</b> <ul style="list-style-type: none"> <li>▪ SCC 30 (Support Facilities) cost elements and associated risks</li> <li>▪ SCC 70 (Vehicles) cost elements and associated risks</li> <li>▪ Express Bus Vehicles and Systems</li> </ul>                                                                  | Risk Lead | Core Team, Transit SMEs (Vehicles, Support Facilities)        |
| 12:00 – 1:00                           | <b>LUNCH</b>                                                                                                                                                                                                                                                                                                                                    |           |                                                               |
| 1:00 pm                                | <b>Transit: Professional services</b> <ul style="list-style-type: none"> <li>▪ SCC 80 cost elements and associated risks: engineering, PM/CM</li> <li>▪ Express Bus Programmatic Issues</li> <li>▪ FTA CIG Process</li> </ul>                                                                                                                   | Risk Lead | Core Team, Transit SMEs (Management, FTA), Program Leadership |
| 1:45 pm                                | <b>Transit: Sitework/Construction</b> <ul style="list-style-type: none"> <li>▪ SCC 40 (Sitework and Special Conditions) cost elements and associated risks</li> <li>▪ Elevated guideway construction</li> <li>▪ Track installation</li> <li>▪ Systems installation and commissioning</li> <li>▪ Station construction</li> <li>▪ Etc.</li> </ul> | Risk Lead | Core Team, Transit SMEs, Construction SMEs                    |
| 2:30 pm                                | <b>BREAK</b>                                                                                                                                                                                                                                                                                                                                    |           |                                                               |
| 2:45 pm                                | <b>Construction/MOT: Roadway/General</b> <ul style="list-style-type: none"> <li>▪ Constructability</li> <li>▪ Construction staging</li> <li>▪ Construction phasing</li> <li>▪ Maintenance of access &amp; services</li> <li>▪ Traffic control</li> </ul>                                                                                        | Risk Lead | Core Team, Construction SMEs, Traffic/MOT SMEs                |
| 4:55 pm                                | <b>Daily wrap-up</b> <ul style="list-style-type: none"> <li>▪ Additional information</li> <li>▪ Clarifications</li> <li>▪ Improvements</li> <li>▪ Tomorrow's plan</li> </ul>                                                                                                                                                                    | Risk Lead | Core Team                                                     |
| 5:00 pm                                | <b>ADJOURN</b>                                                                                                                                                                                                                                                                                                                                  |           |                                                               |
| <b>Day 5 – Friday, August 22, 2025</b> |                                                                                                                                                                                                                                                                                                                                                 |           |                                                               |
| 8:00 am                                | <b>Finance/Tolling</b> <ul style="list-style-type: none"> <li>▪ Funding</li> <li>▪ Tolling</li> </ul>                                                                                                                                                                                                                                           | Risk Lead | Core Team, Finance and Tolling SMEs, Program Leadership       |

| Date/Time | Topic                                                                                                                                                               | Leading   | Additional Participants                                |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------|
| 9:30 am   | <b>Program Management</b> <ul style="list-style-type: none"> <li>▪ Project Management / Resources</li> <li>▪ Partner agency coordination</li> <li>▪ Etc.</li> </ul> | Risk Lead | Core Team, Program Leadership                          |
| 10:45 am  | <b>BREAK</b>                                                                                                                                                        |           |                                                        |
| 11:00 am  | <b>Cultural Resources</b> <ul style="list-style-type: none"> <li>▪ Cultural resources</li> </ul>                                                                    | Risk Lead | Core Team, Cultural Resource/ Tribal Coordination SMEs |
| 12:00 pm  | <b>LUNCH</b>                                                                                                                                                        |           |                                                        |
| 1:00 pm   | <b>Leadership Debrief</b> <ul style="list-style-type: none"> <li>▪ Summary of most significant risks</li> <li>▪ Action items</li> <li>▪ Next Steps</li> </ul>       | Risk Lead | Core Team, Program Leadership                          |
| 2:00 pm   | <b>Hold for Risk Register Review / Parking Lot Items (as needed)</b>                                                                                                | Risk Lead | Core Team                                              |
| 3:00 pm   | <b>Adjourn</b>                                                                                                                                                      |           |                                                        |

Table A-1. Workshop Participants

| Name            | Organization | August 18 | August 19 | August 20 | August 21 | August 22 |
|-----------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Aaron Deas      | IBR GEC      | —         | —         | Virtual   | —         | —         |
| Aidan Gronauer  | WSDOT        | Virtual   | —         | In-Person | —         | —         |
| Alan Keizur     | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Alex Mannion    | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Amanda Ishikawa | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Amy Leland      | WSDOT        | —         | In-Person | —         | —         | —         |
| Amy Lewis       | IBR GEC      | Virtual   | Virtual   | Virtual   |           |           |
| Ana Toupik      | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Andrew Fiske    | WSDOT        | Virtual   | Virtual   | —         | —         | —         |
| Angela Findley  | IBR GEC      | Virtual   | Virtual   | Virtual   | —         | Virtual   |
| Angela Kargel   | ODOT         | Virtual   | Virtual   | —         | —         | —         |
| Anne Pressentin | IBR GEC      | In-Person | In-Person | In-Person | —         | —         |
| Ashraf Aly      | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Atousa Gorg     | IBR GEC      | Virtual   | In-Person | Virtual   | In-Person | Virtual   |

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| Name              | Organization | August 18 | August 19 | August 20 | August 21 | August 22 |
|-------------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Ben Haines        | USDOT        | —         | Virtual   | —         | —         | —         |
| Brent Baker       | IBR GEC      | Virtual   | —         | Virtual   | —         | Virtual   |
| Brian Wood        | ODOT         | Virtual   | Virtual   | Virtual   | —         | —         |
| Brittany Cowgill  | IBR GEC      | In-Person | In-Person | In-Person | —         | —         |
| Calvin Lee        | TriMet       | Virtual   | In-Person | In-Person | Virtual   | —         |
| Caroline Brabrook | IBR GEC      | Virtual   | Virtual   | Virtual   | —         | —         |
| Caryn Urata       | TriMet       | In-Person | In-Person | In-Person | In-Person | In-Person |
| Casey Kramer      | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Casey Liles       | WSDOT        | In-Person | In-Person | In-Person | In-Person | In-Person |
| Cesar Lopez       | ODOT         | In-Person | In-Person | In-Person | In-Person | In-Person |
| Charla Skaggs     | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Charlene Byrd     | WSDOT        | Virtual   | Virtual   | Virtual   | —         | —         |
| Cheryl Mareno     | IBR GEC      | —         | —         | —         | —         | Virtual   |
| Chris Dunster     | WSDOT        | In-Person | In-Person | In-Person | In-Person | In-Person |
| Chris Nutakor     | FTA          | Virtual   | —         | —         | Virtual   | —         |

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| Name                    | Organization | August 18 | August 19 | August 20 | August 21 | August 22 |
|-------------------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Chris Primm             | ODOT         | Virtual   | Virtual   | —         | —         | —         |
| Chris Regan             | WSDOT        | In-Person | In-Person | —         | —         | In-Person |
| Chris Woods             | USDOT        | —         | —         | Virtual   | —         | —         |
| Christi McDaniel-Wilson | USDOT        | Virtual   | Virtual   | —         | —         | —         |
| Christina Martinez      | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Chuck Holt              | WSDOT        | —         | —         | —         | Virtual   | —         |
| Chuck Meade             | WSDOT        | In-Person | In-Person | In-Person | In-Person | —         |
| Cindy Clark             | IBR GEC      | Virtual   | Virtual   | Virtual   | —         | —         |
| Coery McManus           | TriMet       | —         | —         | —         | Virtual   | —         |
| Cole Heiden             | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Colleen Vaughn          | USDOT        | —         | —         | —         | —         | Virtual   |
| Connie Lelack           | ODOT         | Virtual   | —         | Virtual   | —         | —         |
| Coral Egnew             | TriMet       | Virtual   | —         | In-Person | —         | Virtual   |
| Corey Walker            | FTA          | Virtual   | —         |           | —         | —         |
| Courtney Gianturco      | USDOT        | Virtual   | —         | —         | —         | Virtual   |

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| Name                  | Organization | August 18 | August 19 | August 20 | August 21 | August 22 |
|-----------------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Dan Backman           | WSDOT        | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Daniele Dunjic        | WSDOT        | Virtual   | In-Person | Virtual   | Virtual   | Virtual   |
| Daryl Wendle          | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Dave Unsworth         | TriMet       | Virtual   | —         | —         | —         | Virtual   |
| David Nicolardi       | TriMet       | Virtual   | Virtual   | Virtual   | —         | Virtual   |
| David Rodriguez       | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Dianna McKeon         | USDOT        | Virtual   | Virtual   | Virtual   | —         | —         |
| Doug Spencer          | ODOT         | —         | Virtual   | —         | —         | —         |
| Elisa Albury          | USDOT        | Virtual   | Virtual   | Virtual   | —         | Virtual   |
| Emilee Thomas Peralta | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Enrique Mariscal      | TriMet       | In-Person | Virtual   | In-Person | In-Person | —         |
| Eric Beckman          | IBR GEC      | In-Person | —         | —         | In-Person | In-Person |
| Eric Forsyth          | TriMet       | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Erin Parker           | USDOT        | Virtual   | Virtual   | —         | —         | —         |
| Evan Garich           | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | —         |

## Cost Estimate Validation Process (CEVP) Report

| Name                  | Organization | August 18 | August 19 | August 20 | August 21 | August 22 |
|-----------------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Frank Green           | WSDOT        | In-Person | In-Person | In-Person | In-Person | In-Person |
| Gaby Zhu              | ODOT         | Virtual   | Virtual   | Virtual   | —         | Virtual   |
| Garrett Helm          | TriMet       | In-Person | —         | In-Person | Virtual   | Virtual   |
| Gary Martindale       | USDOT        | Virtual   | —         | Virtual   | —         | —         |
| Grace Crunican        | IBR GEC      | Virtual   | Virtual   | Virtual   | In-Person | Virtual   |
| Greg Brink            | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Greg Kolb             | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Guadalupe Gonzalez    | IBR GEC      | Virtual   | —         | Virtual   | Virtual   | —         |
| Hayli Ballentine-Reff | ODOT         | Virtual   | —         | —         | —         | Virtual   |
| Heidi Shoblom         | ODOT         | Virtual   | —         | —         | —         | —         |
| Holli Pick            | ODOT         | Virtual   | —         | Virtual   | —         | —         |
| Irina Leschuk         | IBR GEC      | Virtual   | Virtual   | Virtual   | —         | —         |
| Jaime Viramontes      | ODOT         | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Jamal Grainawi        | IBR GEC      | Virtual   | Virtual   | —         | —         | —         |
| January Tavel         | IBR GEC      | Virtual   | Virtual   | —         | —         | Virtual   |

## Cost Estimate Validation Process (CEVP) Report

| Name                | Organization | August 18 | August 19 | August 20 | August 21 | August 22 |
|---------------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Jason Lukasik       | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Jason Shaddix       | ODOT         | —         | Virtual   | —         | —         | —         |
| Jayson Buchholz     | ODOT         | Virtual   | —         | Virtual   | —         | —         |
| Jeb Doran           | TriMet       | In-Person | In-Person | In-Person | In-Person | In-Person |
| Jeff Horton         | USDOT        | In-Person | In-Person | In-Person | In-Person | In-Person |
| Jenn Allaire        | USDOT        | —         | —         | Virtual   | —         | —         |
| Jennifer Charlebois | WSDOT        | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Jill Marilley       | IBR GEC      | In-Person | In-Person | In-Person | —         | Virtual   |
| Jim Bauman          | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Joe Recker          | TriMet       | Virtual   | —         | —         | —         | —         |
| Joe Wolf            | ODOT         | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Joel Barnett        | USDOT        | —         | Virtual   | Virtual   | Virtual   | —         |
| John Horne          | IBR GEC      | In-Person | In-Person | In-Person | In-Person | —         |
| John Messina        | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Johnell Bell        | IBR GEC      | Virtual   | —         | Virtual   | —         | —         |

## Cost Estimate Validation Process (CEVP) Report

| Name               | Organization | August 18 | August 19 | August 20 | August 21 | August 22 |
|--------------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Jose Canales       | IBR GEC      | Virtual   | Virtual   | —         | —         | —         |
| Joshua Tax         | ODOT         | In-Person | In-Person | In-Person | In-Person | In-Person |
| Julie Heilman      | WSDOT        | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Julie Meredith     | WSDOT        | Virtual   | —         | —         | —         | —         |
| Justin King        | ODOT         | Virtual   | —         | —         | Virtual   | —         |
| Karen Scott        | ODOT         | Virtual   | —         | Virtual   | —         | —         |
| Kassandra Rippee   | ODOT         | In-Person | In-Person | In-Person | —         | In-Person |
| Kat Halpenny       | ODOT         | Virtual   | Virtual   | In-Person | —         | —         |
| Kate Elliott       | IBR GEC      | Virtual   | Virtual   | Virtual   | —         | Virtual   |
| Katy Belokonny     | IBR GEC      | In-Person | In-Person | In-Person | —         | —         |
| Kelley Dolan       | USDOT        | Virtual   | —         | —         | —         | —         |
| Kelly Martin       | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Ken Stockett       | WSDOT        | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Kevin Haas         | ODOT         | Virtual   | In-Person | —         | —         | —         |
| Kimberly Pincheira | WSDOT        | In-Person | In-Person | Virtual   | —         | —         |

## Cost Estimate Validation Process (CEVP) Report

| Name                   | Organization | August 18 | August 19 | August 20 | August 21 | August 22 |
|------------------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Kris Bellenbaum        | ODOT         | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Kristen Leonard        | IBR GEC      | Virtual   | Virtual   | Virtual   | —         | Virtual   |
| Kyle Wachter           | WSDOT        | Virtual   | Virtual   | —         | —         | —         |
| Leah Robbins           | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Liantao Xu             | ODOT         | In-Person | In-Person | —         | —         | —         |
| Lisa Gavin             | FTA          | Virtual   | —         | —         | —         | —         |
| LisaRene Schilperoort  | WSDOT        | Virtual   | Virtual   | —         | —         | —         |
| Loren Wilson           | USDOT        | —         | Virtual   | —         | —         | —         |
| Louis Alcorn           | IBR GEC      | Virtual   | —         | Virtual   | Virtual   | Virtual   |
| Lucas Johnson          | TriMet       | Virtual   | —         | —         | Virtual   | —         |
| Makenzie (ZZ) Lundburg | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Marcelo Suarez         | IBR GEC      | —         | —         | Virtual   | —         | —         |
| Marian Rule            | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Maribel Cruz           | IBR GEC      | In-Person | In-Person | In-Person | —         | —         |
| Marjorie Hughes        | USDOT        | Virtual   | —         | —         | —         | Virtual   |

## Cost Estimate Validation Process (CEVP) Report

| Name            | Organization | August 18 | August 19 | August 20 | August 21 | August 22 |
|-----------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Mark Gabel      | WSDOT        | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Mark Sujka      | WSDOT        | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Mathers Heuck   | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Matthew Freitag | ODOT         | Virtual   | —         | —         | —         | —         |
| Megan McIntyre  | IBR GEC      | Virtual   | —         | Virtual   | —         | —         |
| Meghan Hodges   | WSDOT        | In-Person | Virtual   | In-Person | —         | Virtual   |
| Melissa Garr    | WSDOT        | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Michael Oborn   | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Michael Oldroyd | IBR GEC      | Virtual   | Virtual   | Virtual   | —         | —         |
| Michael Pyszka  | IBR GEC      | In-Person | In-Person | —         | In-Person | —         |
| Mike Fleming    | WSDOT        | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Mike Kimlinger  | ODOT         | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Mike Lev        | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Mike Schoeff    | IBR GEC      | In-Person | Virtual   | Virtual   | Virtual   | Virtual   |
| Mike Southwick  | WSDOT        | Virtual   | Virtual   | —         | Virtual   | —         |

## Cost Estimate Validation Process (CEVP) Report

| Name                 | Organization | August 18 | August 19 | August 20 | August 21 | August 22 |
|----------------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Mohammad Sheikhabadi | WSDOT        | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Molly Fandrich       | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Morgan Stumpf        | IBR GEC      | Virtual   | —         | Virtual   | Virtual   | —         |
| Nathan Potter        | ODOT         | In-Person | In-Person | In-Person | In-Person | In-Person |
| Nick Fortey          | USDOT        | Virtual   | Virtual   | —         | Virtual   | —         |
| Paige Schlupp        | TriMet       | In-Person | —         | In-Person | In-Person | In-Person |
| Patrick Forza        | IBR GEC      | Virtual   | —         | Virtual   | —         | —         |
| Patty Rubstello      | IBR GEC      | —         | —         | —         | —         | Virtual   |
| Paula Johnson        | IBR GEC      | —         | Virtual   | —         | —         | —         |
| Phil Crowley         | ODOT         | —         | Virtual   | Virtual   | —         | —         |
| Prashaant Kulkarni   | TriMet       | —         | —         | —         | Virtual   |           |
| Ralph Salamie        | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Ray Bottenberg       | ODOT         | In-Person | In-Person | Virtual   | —         | —         |
| Ray Smith            | WSDOT        | —         | —         | —         | Virtual   | —         |
| Regina Thompson      | ODOT         | Virtual   | Virtual   | Virtual   | —         | —         |

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| Name           | Organization | August 18 | August 19 | August 20 | August 21 | August 22 |
|----------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Rick Judd      | USDOT        | Virtual   | Virtual   | Virtual   | —         | Virtual   |
| Rob Brusseau   | WSDOT        | Virtual   | Virtual   | —         | —         | —         |
| Robert Algazi  | IBR GEC      | Virtual   | Virtual   | —         | —         | —         |
| Robert Turton  | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   |           |
| Roger Flint    | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | In-Person |
| Rosa Chen      | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Ryan LeProwse  | IBR GEC      | Virtual   | Virtual   | —         | Virtual   | —         |
| Samone Stinson | ODOT         | Virtual   | —         | Virtual   | —         | —         |
| Sarah Espinosa | TriMet       | In-Person | In-Person | In-Person | In-Person | In-Person |
| Sarah Touey    | IBR GEC      | —         | —         | —         | Virtual   | —         |
| Scott Cramer   | ODOT         | Virtual   | Virtual   | —         | —         | —         |
| Scott Mercer   | WSDOT        | Virtual   | Virtual   | —         | —         | —         |
| Scotty Ireland | IBR GEC      | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Sean Nikkila   | ODOT         | Virtual   | —         | —         | —         | Virtual   |
| Serin Bussell  | ODOT         | Virtual   | —         | Virtual   | —         | —         |

## Cost Estimate Validation Process (CEVP) Report

| Name             | Organization | August 18 | August 19 | August 20 | August 21 | August 22 |
|------------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Shae McCulloch   | IBR GEC      | Virtual   | In-Person | In-Person | In-Person | Virtual   |
| Shawn Ellis      | IBR GEC      | Virtual   | —         | Virtual   | —         | —         |
| Shawn Rapp       | ODOT         | Virtual   | —         | —         | —         | —         |
| Shay Witucki     | USDOT        | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Shelli Romero    | ODOT         | Virtual   | —         | —         | —         | —         |
| Shilpa Mallem    | ODOT         | In-Person | In-Person | In-Person | In-Person | In-Person |
| Shin-Che Huang   | USDOT        | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Stephanie Miller | IBR GEC      | —         | —         | Virtual   | —         | —         |
| Steve Katko      | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Steven Witter    | C-TRAN       | In-Person | In-Person | In-Person | In-Person | In-Person |
| Susan Fletcher   | FTA          | —         | —         | —         | —         | Virtual   |
| Susan Ortiz      | ODOT         | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Tammy Saldivar   | WSDOT        | Virtual   | Virtual   | In-Person | —         | —         |
| Thomas Parker    | USDOT        | In-Person | In-Person | —         | —         | In-Person |
| Thomas Walther   | TriMet       | —         | —         | —         | Virtual   | —         |

## Cost Estimate Validation Process (CEVP) Report

| Name            | Organization | August 18 | August 19 | August 20 | August 21 | August 22 |
|-----------------|--------------|-----------|-----------|-----------|-----------|-----------|
| Tiffany Bennett | ODOT         | Virtual   | Virtual   | Virtual   | —         | Virtual   |
| Tom Goldstein   | FHWA         | In-Person | In-Person | In-Person | In-Person | In-Person |
| Tom Grummon     | ODOT         | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Tomer Curiel    | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Trent Eakin     | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Troy Wilson     | ODOT         | Virtual   | Virtual   | Virtual   | Virtual   | —         |
| Tyler Patterson | WSDOT        | Virtual   | Virtual   | Virtual   | Virtual   | Virtual   |
| Veronica Raub   | WSDOT        | Virtual   | Virtual   | —         | —         | —         |
| Victor Brinic   | IBR GEC      | In-Person | In-Person | In-Person | In-Person | In-Person |
| Zach Davis      | ODOT         | In-Person | Virtual   | Virtual   | Virtual   | —         |
| Zoie Wesenberg  | IBR GEC      | —         | In-Person | In-Person | —         | In-Person |

## Appendix B – Package-Level Results

## Cost Estimate Validation Process (CEVP) Report

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Tables B-1 and B-2 provide statistical results for each of the 29 contract packages plus programmatic costs. The package level costs shown in Table B-1 include PE, right of way, and construction costs. As noted previously, the sum of component percentile costs does not necessarily equal the overall Program costs at that same percentile (e.g., P70). However, individual package costs that sum to the overall Program P70 can be adequately estimated by using the nearest percentile that sums to the desired total. Note that this is just one possible combination of package costs that sums to the Program total (this approach assumes perfect positive correlation among package costs). In this case, the P67.5 package costs sum approximately to the Program P70 cost of **\$14,411 million**. These values are shown in Table B-1.

Table B-1. Package-Level Cost Results

| Package Number | Package Name                                   | Millions of YOE dollars |       |       |       |       |       |       |       |       |       |
|----------------|------------------------------------------------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                |                                                | Deterministic Base      | Mean  | P10   | P45   | P50   | P65   | P67.5 | P70   | P85   | P90   |
| 0              | Programmatic Costs                             | 862                     | 1,047 | 947   | 1,031 | 1,041 | 1,073 | 1,079 | 1,085 | 1,134 | 1,157 |
| 1              | 65th Street CTRAN O&M Bus Facility             | 15                      | 17    | 14    | 16    | 16    | 17    | 17    | 18    | 19    | 19    |
| 2              | Bus Procurement                                | 12                      | 14    | 12    | 14    | 14    | 15    | 15    | 15    | 16    | 16    |
| 3              | Bus Shelters                                   | 2                       | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     | 2     |
| 4              | Approaches                                     | 1,700                   | 2,396 | 2,002 | 2,337 | 2,375 | 2,500 | 2,523 | 2,547 | 2,730 | 2,819 |
| 5              | Columbia River Bridge                          | 2,133                   | 3,148 | 2,667 | 3,069 | 3,123 | 3,281 | 3,311 | 3,342 | 3,562 | 3,664 |
| 6              | Columbia River Bridge Removal                  | 315                     | 406   | 340   | 395   | 402   | 422   | 426   | 431   | 462   | 478   |
| 7              | Evergreen Park & Ride                          | 103                     | 121   | 105   | 119   | 120   | 125   | 126   | 127   | 134   | 137   |
| 8              | Hayden Island Guideway                         | 153                     | 204   | 173   | 198   | 201   | 210   | 212   | 214   | 229   | 237   |
| 9              | Hayden Island Package A (Hayden Island Center) | 46                      | 61    | 51    | 59    | 60    | 64    | 64    | 65    | 71    | 74    |
| 10             | Hayden Island Surface Streets                  | 161                     | 202   | 166   | 196   | 200   | 211   | 213   | 216   | 232   | 240   |
| 11             | Light Rail Overnight Facility                  | 91                      | 114   | 97    | 112   | 113   | 119   | 120   | 121   | 128   | 132   |
| 12             | LRV Procurement                                | 195                     | 234   | 209   | 230   | 233   | 241   | 242   | 244   | 255   | 260   |
| 13             | Marine Drive Interchange                       | 646                     | 828   | 685   | 804   | 819   | 867   | 875   | 884   | 949   | 980   |
| 14             | Marine Drive Package A                         | 201                     | 250   | 212   | 246   | 250   | 262   | 264   | 266   | 281   | 289   |

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| Package Number | Package Name                            | Millions of YOE dollars |               |     |       |       |       |               |       |       |       |
|----------------|-----------------------------------------|-------------------------|---------------|-----|-------|-------|-------|---------------|-------|-------|-------|
|                |                                         | Deterministic Base      | Mean          | P10 | P45   | P50   | P65   | P67.5         | P70   | P85   | P90   |
| 15             | Mill Plain Interchange                  | 312                     | 400           | 334 | 389   | 396   | 416   | 421           | 425   | 455   | 470   |
| 16             | North Expo Road                         | 36                      | 45            | 37  | 43    | 44    | 47    | 47            | 48    | 51    | 53    |
| 17             | North Portland Harbor Bridge Removal    | 53                      | 73            | 59  | 71    | 72    | 77    | 78            | 79    | 84    | 87    |
| 18             | North Portland Harbor Transit Bridge    | 107                     | 157           | 126 | 144   | 147   | 155   | 157           | 158   | 189   | 213   |
| 19             | Oregon I-5 Northbound                   | 874                     | 1,173         | 972 | 1,142 | 1,163 | 1,227 | 1,239         | 1,250 | 1,340 | 1,387 |
| 20             | Oregon I-5 Southbound                   | 716                     | 954           | 799 | 932   | 947   | 996   | 1,005         | 1,015 | 1,084 | 1,121 |
| 21             | Oregon Station Finishes                 | 0                       | 0             | 0   | 0     | 0     | 0     | 0             | 0     | 0     | 0     |
| 22             | Pre-Completion Tolling Signage          | 49                      | 56            | 49  | 55    | 55    | 57    | 58            | 58    | 61    | 62    |
| 23             | Ruby Junction TriMet Facility Expansion | 381                     | 475           | 412 | 465   | 472   | 493   | 496           | 500   | 528   | 542   |
| 24             | SR-14 Package A                         | 134                     | 186           | 161 | 182   | 184   | 192   | 193           | 195   | 206   | 213   |
| 25             | Track, Systems & Stations               | 489                     | 641           | 548 | 628   | 637   | 666   | 671           | 677   | 720   | 741   |
| 26             | Washington Station Finishes             | 0                       | 0             | 0   | 0     | 0     | 0     | 0             | 0     | 0     | 0     |
| 27             | Washington North                        | 326                     | 423           | 360 | 412   | 418   | 438   | 442           | 446   | 476   | 491   |
| 28             | Waterfront Park & Ride                  | 91                      | 106           | 91  | 104   | 106   | 110   | 111           | 112   | 118   | 122   |
| 29             | West Hayden Island Mitigation           | 2                       | 6             | 3   | 3     | 3     | 4     | 4             | 4     | 13    | 13    |
|                | <b>Total</b>                            | <b>10,207</b>           | <b>13,738</b> | -   | -     | -     |       | <b>14,411</b> | -     | -     | -     |

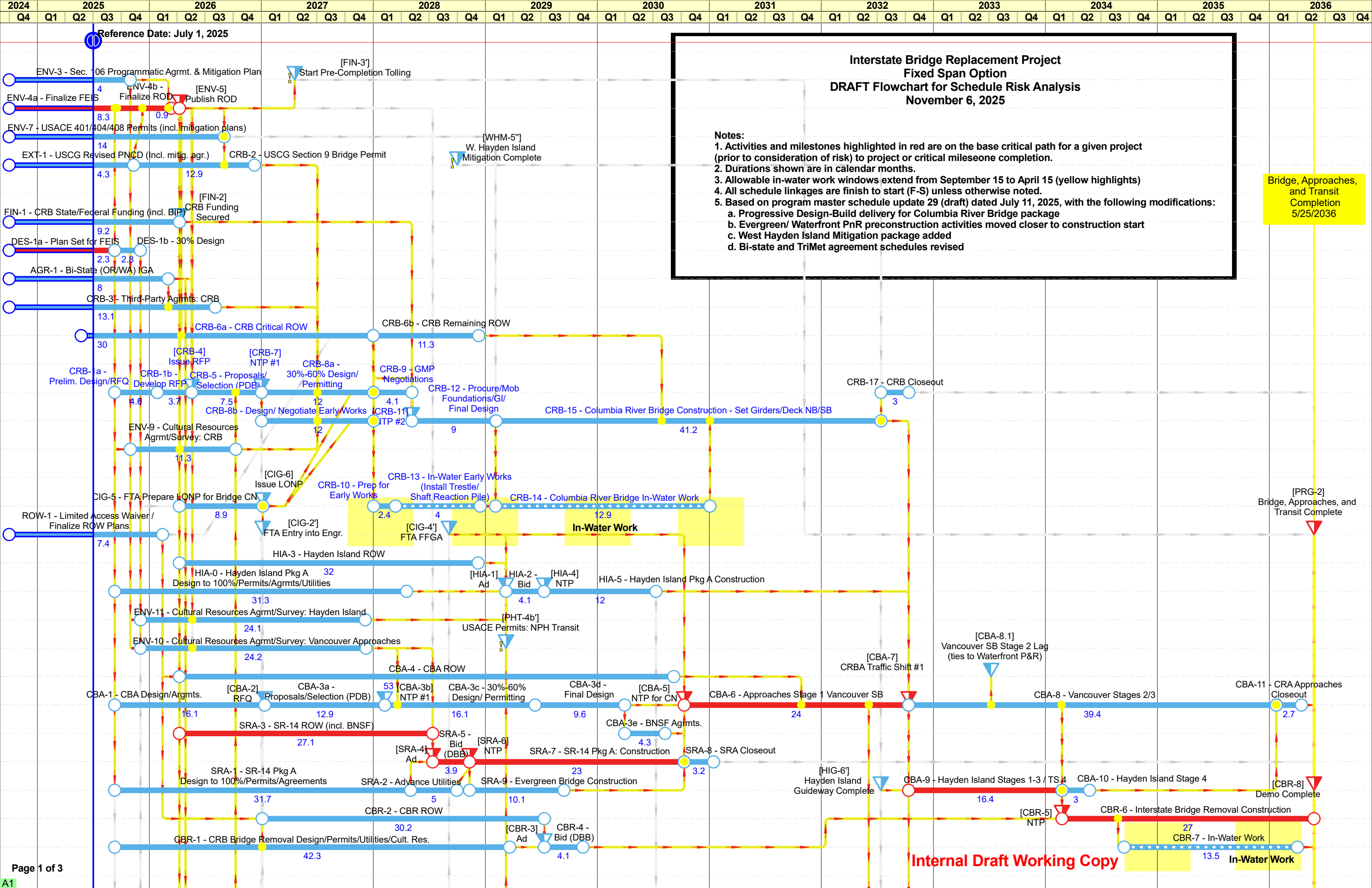
Table B-2. Package-Level Schedule Results

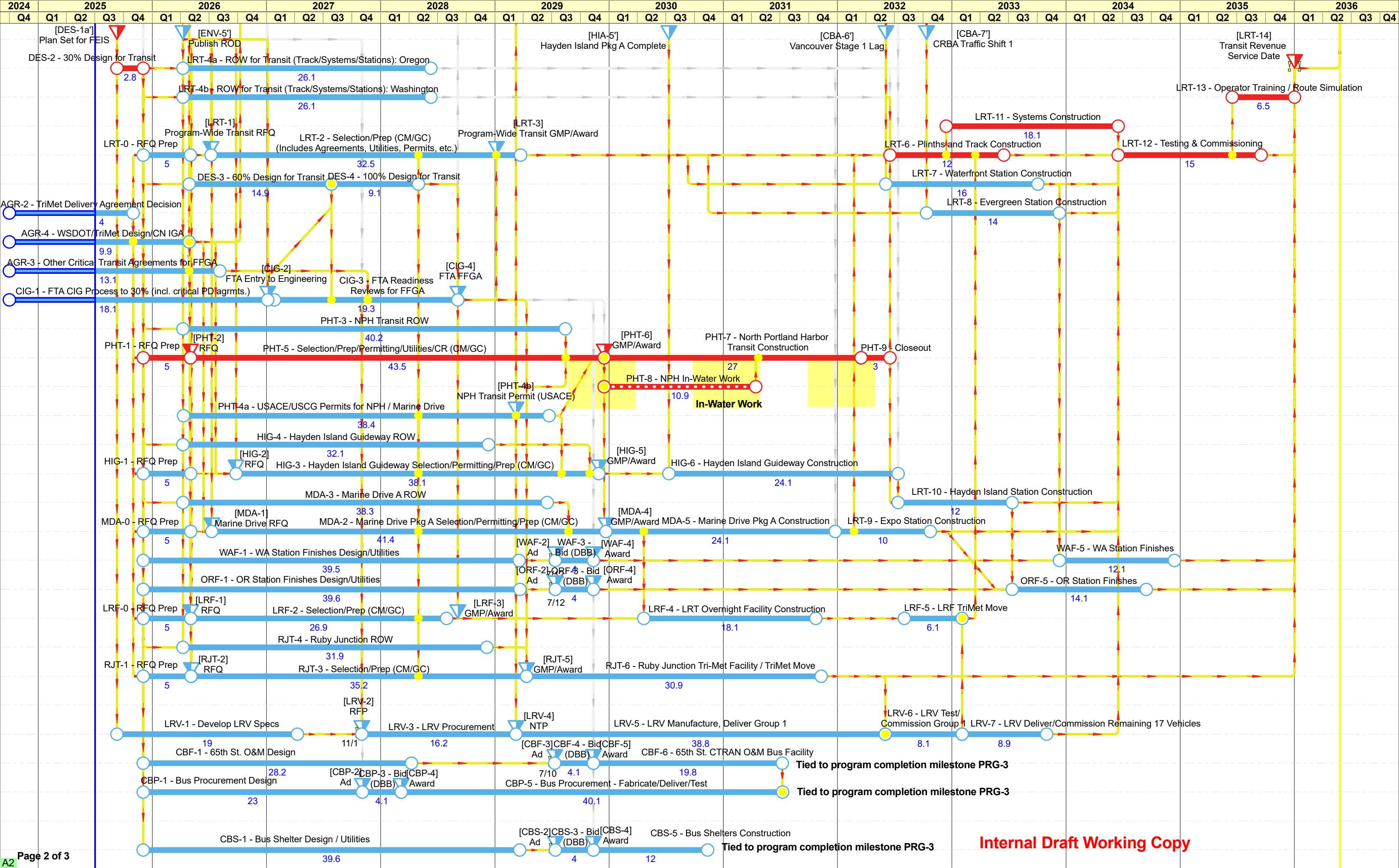
| Package Number | Package Name                                   | Package Completion Date |          |          |          |          |          |          |          |          |
|----------------|------------------------------------------------|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
|                |                                                | Deterministic Base      | Mean     | P10      | P45      | P50      | P65      | P70      | P85      | P90      |
| 0              | Programmatic Costs                             | -                       | -        | -        | -        | -        | -        | -        | -        | -        |
| 1              | 65th Street CTRAN O&M Bus Facility             | Jul 2031                | Jul 2032 | Jul 2031 | Apr 2032 | Jun 2032 | Nov 2032 | Jan 2033 | Jul 2033 | Oct 2033 |
| 2              | Bus Procurement                                | Jul 2031                | Aug 2032 | Aug 2031 | Apr 2032 | Jun 2032 | Nov 2032 | Jan 2033 | Jul 2033 | Oct 2033 |
| 3              | Bus Shelters                                   | Nov 2030                | Nov 2031 | Nov 2030 | Jul 2031 | Sep 2031 | Mar 2032 | May 2032 | Nov 2032 | Jan 2033 |
| 4              | Approaches                                     | Apr 2036                | Aug 2038 | Aug 2037 | Jun 2038 | Jul 2038 | Nov 2038 | Dec 2038 | Jun 2039 | Sep 2039 |
| 5              | Columbia River Bridge                          | Oct 2032                | Nov 2034 | Nov 2033 | Aug 2034 | Oct 2034 | Jan 2035 | Mar 2035 | Sep 2035 | Jan 2036 |
| 6              | Columbia River Bridge Removal                  | May 2036                | Apr 2039 | Apr 2038 | Feb 2039 | Mar 2039 | May 2039 | Sep 2039 | Feb 2040 | Apr 2040 |
| 7              | Evergreen Park & Ride                          | Feb 2035                | Oct 2037 | Aug 2036 | Jul 2037 | Aug 2037 | Jan 2038 | Feb 2038 | Sep 2038 | Jan 2039 |
| 8              | Hayden Island Guideway                         | Jul 2032                | May 2034 | Apr 2033 | Mar 2034 | Apr 2034 | Sep 2034 | Nov 2034 | May 2035 | Aug 2035 |
| 9              | Hayden Island Package A (Hayden Island Center) | Jul 2030                | May 2032 | Apr 2031 | Feb 2032 | Apr 2032 | Sep 2032 | Nov 2032 | May 2033 | Aug 2033 |
| 10             | Hayden Island Surface Streets                  | Jun 2045                | May 2048 | May 2047 | Mar 2048 | May 2048 | Aug 2048 | Sep 2048 | Apr 2049 | Jul 2049 |
| 11             | Light Rail Overnight Facility                  | Feb 2033                | Nov 2034 | Oct 2033 | Aug 2034 | Oct 2034 | Mar 2035 | Apr 2035 | Nov 2035 | Jan 2036 |
| 12             | LRV Procurement                                | Oct 2033                | Jul 2035 | May 2034 | Apr 2035 | Jun 2035 | Nov 2035 | Dec 2035 | Jul 2036 | Sep 2036 |
| 13             | Marine Drive Interchange                       | Mar 2045                | Feb 2048 | Feb 2047 | Dec 2047 | Jan 2048 | May 2048 | Jun 2048 | Jan 2049 | Apr 2049 |
| 14             | Marine Drive Package A                         | Dec 2031                | Mar 2034 | Mar 2033 | Jan 2034 | Feb 2034 | Jul 2034 | Aug 2034 | Feb 2035 | May 2035 |
| 15             | Mill Plain Interchange                         | Feb 2040                | Sep 2042 | Aug 2041 | Jun 2042 | Jul 2042 | Dec 2042 | Jan 2043 | Aug 2043 | Dec 2043 |

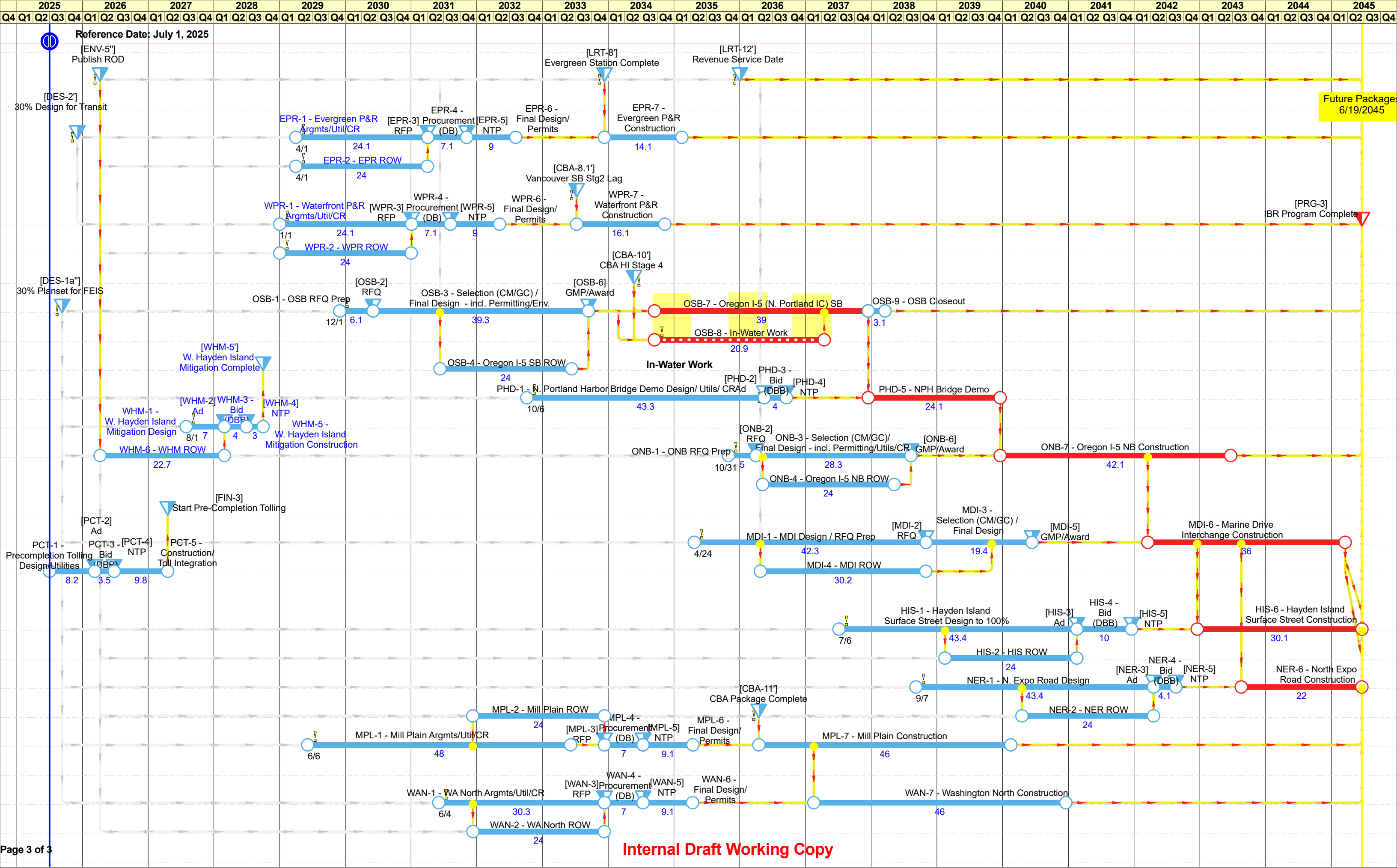
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| Package Number | Package Name                            | Package Completion Date |          |          |          |          |          |          |          |          |
|----------------|-----------------------------------------|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
|                |                                         | Deterministic Base      | Mean     | P10      | P45      | P50      | P65      | P70      | P85      | P90      |
| 16             | North Expo Road                         | Jun 2045                | May 2048 | Jun 2047 | Mar 2048 | May 2048 | Aug 2048 | Sep 2048 | Apr 2049 | Jul 2049 |
| 17             | North Portland Harbor Bridge Removal    | Dec 2039                | Sep 2042 | Oct 2041 | Aug 2042 | Sep 2042 | Dec 2042 | Dec 2042 | Aug 2043 | Nov 2043 |
| 18             | North Portland Harbor Transit Bridge    | Dec 2039                | Sep 2042 | Oct 2041 | Aug 2042 | Sep 2042 | Dec 2042 | Dec 2042 | Aug 2043 | Nov 2043 |
| 19             | Oregon I-5 Northbound                   | Aug 2038                | Oct 2038 | May 2045 | Feb 2046 | Apr 2046 | Jun 2046 | Aug 2046 | Mar 2047 | Jun 2047 |
| 20             | Oregon I-5 Southbound                   | Dec 2037                | Aug 2040 | Sep 2039 | Jun 2040 | Aug 2040 | Dec 2040 | Dec 2040 | Jul 2041 | Oct 2041 |
| 21             | Oregon Station Finishes                 | Sep 2034                | Nov 2036 | Nov 2035 | Aug 2036 | Oct 2036 | Mar 2037 | May 2037 | Oct 2037 | Jan 2038 |
| 22             | Pre-Completion Tolling Signage          | Apr 2027                | Sep 2027 | Apr 2027 | Jul 2027 | Aug 2027 | Oct 2027 | Nov 2027 | Mar 2028 | Apr 2028 |
| 23             | Ruby Junction TriMet Facility Expansion | Nov 2031                | Dec 2033 | Nov 2032 | Oct 2033 | Nov 2033 | Apr 2034 | Jun 2034 | Dec 2034 | Feb 2035 |
| 24             | SR-14 Package A                         | Jan 2031                | May 2032 | Jul 2031 | Mar 2032 | Apr 2032 | Jul 2032 | Sep 2032 | Feb 2033 | Apr 2033 |
| 25             | Track, Systems & Stations               | Sep 2035                | Oct 2038 | Sep 2037 | Aug 2038 | Sep 2038 | Jan 2039 | Mar 2039 | Aug 2039 | Dec 2039 |
| 26             | Washington Station Finishes             | Dec 2034                | Sep 2037 | Jul 2036 | Jun 2037 | Jul 2037 | Dec 2037 | Jan 2038 | Sep 2038 | Dec 2038 |
| 27             | Washington North                        | Dec 2040                | Jul 2043 | Jun 2042 | May 2043 | Jun 2043 | Oct 2043 | Dec 2043 | Jul 2044 | Nov 2044 |
| 28             | Waterfront Park & Ride                  | Nov 2034                | Apr 2037 | Apr 2036 | Jan 2037 | Feb 2037 | Jun 2037 | Aug 2037 | Feb 2038 | May 2038 |
| 29             | West Hayden Island Mitigation           | Jul 2028                | Nov 2028 | Aug 2028 | Sep 2028 | Sep 2028 | Nov 2028 | Nov 2028 | Feb 2029 | Mar 2029 |

## Appendix C – Schedule Summary







## Cost Estimate Validation Process (CEVP) Report

Table C-1. Schedule Flowchart Logic Summary

| Activity ID | Activity Name                                                    | Predecessor(s)                                                                                     | Successor(s)                                                                                                                                                                                                                                              |
|-------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PRG-1a      | Program Management Pre-ROD (F-F with ROD, ENV-5)                 | ENV-5 FF                                                                                           | PRG-1b                                                                                                                                                                                                                                                    |
| PRG-1b      | Program Management Post-ROD (F-F with program completion, PRG-3) | PRG-1a, PRG-3 FF                                                                                   |                                                                                                                                                                                                                                                           |
| PRG-2       | Bridges, Approaches, and Transit Complete                        | LRT-14 FS,"CBA-11 FS","SRA-8 FS","CRB-17 FS","FIN-3' FS","CBR-8 FS"                                |                                                                                                                                                                                                                                                           |
| PRG-3       | IBR Program Complete                                             | HIS-6 FS,"ONB-7 FS","LRT-12' FS","MPL-7 FS","WAN-7 FS","OSB-9 FS","EPR-7 FS","WPR-7 FS","NER-6 FS" | PRB-1b FF                                                                                                                                                                                                                                                 |
|             |                                                                  |                                                                                                    |                                                                                                                                                                                                                                                           |
| DES-1a      | Plan Set for FEIS                                                |                                                                                                    | SRA-1 FS,"CBR-1 FS","DES-1a' FS","CRB-1a FS","ENV-9 FS","CBA-1 FS","HIA-0 FS","ENV-4a FF184","DES-1b FS", DES-1a"                                                                                                                                         |
| DES-1a'     | Plan Set for FEIS                                                | DES-1a FS                                                                                          | DES-2 FS,"LRV-1 FS"                                                                                                                                                                                                                                       |
| DES-1a''    | Plan Set for FEIS                                                | DES-1a                                                                                             | OSB-1 FS,"MDI-1 FS","PHD-1 FS","ONB-1 FS","NER-1 FS","HIS-1 FS","MPL-1 FS","WAN-1 FS","WHM-1 FS"                                                                                                                                                          |
| DES-1b      | 30% Design                                                       | DES-1a FS                                                                                          | ENV-11 FS,"ENV-10 FS"                                                                                                                                                                                                                                     |
| DES-2       | 30% Design for Transit                                           | DES-1a' FS                                                                                         | CIG-5 FS,"PHT-2 FS","PHT-1 FS","LRF-1 FS","ORF-1 FS","WAF-1 FS","RJT-1 FS","CBF-1 FS","CBS-1 FS","CBP-1 FS","LRT-4a FS","LRT-4b FS","PHT-3 FS","LRT-0 FS","HIG-1 FS","HIG-4 FS","MDA-0 FS","LRF-0 FS","RJT-4 FS","MDA-3 FS","CRB-7 FS","DES-3 FS", DES-2' |
| DES-2'      | 30% Design for Transit                                           | DES-2                                                                                              | EPR-1 FS,"WPR-1 FS"                                                                                                                                                                                                                                       |
| DES-3       | 60% Design for Transit                                           | DES-2 FS,"CIG-2 FF","AGR-4 FS"                                                                     | CIG-3 FF404,"DES-4 FS"                                                                                                                                                                                                                                    |
| DES-4       | 100% Design for Transit                                          | DES-3 FS                                                                                           | CIG-4 FS,"LRT-2 FF327","HIG-3 FF577","MDA-2 FF600","LRF-2 FF90","RJT-3 FF346","PHT-4a FF418"                                                                                                                                                              |
|             |                                                                  |                                                                                                    |                                                                                                                                                                                                                                                           |
| ENV-1       | Publish Draft SEIS                                               |                                                                                                    |                                                                                                                                                                                                                                                           |
| ENV-2       | ESA Section 7 / BO                                               |                                                                                                    |                                                                                                                                                                                                                                                           |
| ENV-3       | Section 106 Programmatic Agreement & Mitigation Plan             |                                                                                                    | ENV-9 FS,"ENV-4a FF9","ENV-11 FS","ENV-10 FS"                                                                                                                                                                                                             |
| ENV-4a      | Finalize FEIS                                                    | ENV-3 FF9,"DES-1a FF184","EXT-1 FF94"                                                              | ENV-4b FS                                                                                                                                                                                                                                                 |
| ENV-4b      | Issue ROD                                                        | ENV-4a FS                                                                                          | ENV-5 FS                                                                                                                                                                                                                                                  |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                                   | Predecessor(s)                     | Successor(s)                                                                                                                                                                                                              |
|-------------|-----------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ENV-5       | Publish ROD                                                     | ENV-4b FS                          | CRB-4 FS,"SRA-3 FS","HIA-3 FS","ENV-5' FS","FIN-2 FS","ENV-7 FF","SRA-4 FS","CBA-4 FS","MDA-3 FS","CIG-5 FS","CBR-2 FS","CRB-6a FF626","ENV-9 FF183","ENV-11 FF564","ENV-10 FF567","FIN-3' FS", ENV-5a, ENV-5", PRF-1a FF |
| ENV-5'      | Publish ROD                                                     | ENV-5 FS                           | LRT-4a FS,"LRT-4b FS","CIG-2 FS","RJT-4 FS","PHT-3 FS","PHT-4a FS","HIG-4 FS","LRV-2 FS","LRT-1 FS","PHT-2 FS","HIG-2 FS","MDA-1 FS","LRF-1 FS","RJT-2 FS","CBP-2 FS"                                                     |
| ENV-5"      | Publish ROD                                                     | ENV-5                              | MPL-2 FS,"MDI-4 FS","EPR-2 FS","WPR-2 FS","OSB-4 FS","NER-2 FS","HIS-2 FS","WAN-2 FS","WHM-6 FS"                                                                                                                          |
| ENV-5a      | Post-ROD                                                        | , ENV-5                            | , CRB-8a FF, CRB-8b FF, SRA-6                                                                                                                                                                                             |
| ENV-7       | USACE 401/404/408 Permits                                       | ENV-5 FF                           | CRB-2 FF99,"CRB-14 FS"                                                                                                                                                                                                    |
| ENV-9       | Cultural Resources Agrmt/Survey: CRB                            | DES-1a FS,"ENV-3 FS","ENV-5 FF183" | CRB-8a FF183,"CRB-8b FF183"                                                                                                                                                                                               |
| ENV-10      | Cultural Resources Agrmt/Survey: Vancouver Approaches           | ENV-3 FS,"DES-1b FS","ENV-5 FF567" | SRA-4 FS,"CBA-3c FF449"                                                                                                                                                                                                   |
| ENV-11      | Cultural Resources Agrmt/Survey: Hayden Island                  | ENV-3 FS,"DES-1b FS","ENV-5 FF564" | HIA-1 FS                                                                                                                                                                                                                  |
| EXT-1       | USCG PNCD                                                       |                                    | CRB-2 FS,"ENV-4a FF94"                                                                                                                                                                                                    |
| ROW-1       | Limited Access Waiver (WA) / Finalize Right of Way Plans        |                                    | CBA-4 FS,"CBR-2 FS","CRB-6b FS"                                                                                                                                                                                           |
| AGR-1       | Bi-State (OR/WA) Intergovernmental Agreement (incl. governance) |                                    | CRB-4 FS,"CRB-3 FF153","AGR-4 FF"                                                                                                                                                                                         |
| AGR-2       | TriMet Delivery Agreement Decision                              |                                    | LRT-0 FS,"PHT-1 FS","HIG-1 FS","MDA-0 FS","LRF-0 FS","RJT-1 FS","AGR-4 FF179"                                                                                                                                             |
| AGR-3       | Critical Transit Agreements for FFGA                            | AGR-4 FF98                         | CIG-3 FF288                                                                                                                                                                                                               |
| AGR-4       | WSDOT/TriMet Design/Construction IGA                            | AGR-2 FF179,"AGR-1 FF"             | CRB-5 FF85,"AGR-3 FF98","DES-3 FS","PHT-2 FS","HIG-2 FS","MDA-1 FS","LRF-1 FS","RJT-2 FS"                                                                                                                                 |
| FIN-1       | CRB State/Federal Funding (incl. BIP)                           |                                    | FIN-2 FS                                                                                                                                                                                                                  |
| FIN-2       | CRB Funding Secured                                             | ENV-5 FS,"FIN-1 FS"                | CRB-11 FS                                                                                                                                                                                                                 |
| FIN-3       | Start Pre-Completion Tolling                                    | PCT-5 FS                           | FIN-3'                                                                                                                                                                                                                    |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                               | Predecessor(s)                                                                       | Successor(s)                                                                                                 |
|-------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| FIN-3'      | Start Pre-Completion Tolling                                | ENV-5 FS, FIN-3                                                                      | PRG-2 FS                                                                                                     |
| CIG-1       | FTA CIG Process to 30%                                      |                                                                                      | CIG-2 FS                                                                                                     |
| CIG-2       | FTA Approval for Entry into Engineering                     | CIG-1 FS,"ENV-5' FS"                                                                 | CIG-3 FS,"LRV-2 FS","CIG-2' FS","DES-3 FF"                                                                   |
| CIG-2'      | FTA Approval for Entry into Engineering                     | CIG-2 FS                                                                             | CIG-5 FF                                                                                                     |
| CIG-3       | FTA Readiness Reviews for FFGA                              | CIG-2 FS,"AGR-3 FF288","DES-3 FF404"                                                 | CIG-4 FS                                                                                                     |
| CIG-4       | FTA FFGA                                                    | CIG-3 FS,"DES-4 FS"                                                                  | PHT-6 FS,"RJT-5 FS","LRV-4 FS","CBF-5 FS","CBS-4 FS","LRT-3 FS","WAF-4 FS","ORF-4 FS","CIG-4' FS","LRF-3 FS" |
| CIG-4'      | FTA FFGA                                                    | CIG-4 FS                                                                             | CBA-5 FS,"HIA-1 FS"                                                                                          |
| CIG-5       | FTA Prepare LONP for Bridge Construction                    | ENV-5 FS,"DES-2 FS","CIG-2' FF"                                                      | CIG-6 FS                                                                                                     |
| CIG-6       | Issue LONP                                                  | CIG-5 FS                                                                             | CRB-8b FF,"CRB-8a FF"                                                                                        |
| CRB-1a      | Columbia River Bridge Preliminary Design/RFQ                | DES-1a FS, Risk FF Link                                                              | CRB-1b FS                                                                                                    |
| CRB-1b      | Columbia River Bridge RFQ Response / Develop RFP            | CRB-1a FS                                                                            | CRB-4 FS                                                                                                     |
| CRB-2       | USCG Bridge Permit                                          | EXT-1 FS,"ENV-7 FF99"                                                                | CRB-8a FF183,"CRB-8b FF183"                                                                                  |
| CRB-3       | Third-Party Agreements: CRB                                 | AGR-1 FF153                                                                          | CRB-8a FF183,"CRB-8b FF183"                                                                                  |
| CRB-4       | Columbia River Bridge (CRB) RFP                             | ENV-5 FS,"CRB-1b FS","AGR-1 FS"                                                      | CRB-5 FS                                                                                                     |
| CRB-5       | CRB Proposals/Selection (PDB)                               | CRB-4 FS,"AGR-4 FF85"                                                                | CRB-7 FS                                                                                                     |
| CRB-6a      | CRB Critical Right of Way                                   | ENV-5 FF626                                                                          | CRB-6b FS,"CRB-8b FF","CRB-11 FS"                                                                            |
| CRB-6b      | CRB Remaining Right of Way                                  | CRB-6a FS,"ROW-1 FS"                                                                 | CRB-15 FF715                                                                                                 |
| CRB-7       | Issue CRB NTP #1                                            | CRB-5 FS,"DES-2 FS"                                                                  | CRB-8b FS,"CRB-8a FS"                                                                                        |
| CRB-8a      | CRB 30%-60% Design                                          | CRB-2 FF183,"CRB-3 FF183","ENV-9 FF183","CIG-6 FF","CRB-7 FS", ENV-5a FF             | CRB-11 FS,"CRB-9 FS"                                                                                         |
| CRB-8b      | Design / Negotiations for Early Work Packages               | CRB-7 FS,"ENV-9 FF183","CRB-2 FF183","CRB-3 FF183","CRB-6a FF","CIG-6 FF", ENV-5a FF | CRB-10 FS                                                                                                    |
| CRB-9       | GMP Negotiations                                            | CRB-8a FS                                                                            | CRB-11 FS                                                                                                    |
| CRB-10      | Prep for Early Works                                        | CRB-8b FS                                                                            | CRB-13 FS                                                                                                    |
| CRB-11      | CRB NTP #2                                                  | FIN-2 FS,"CRB-8a FS","CRB-9 FS","CRB-6a FS"                                          | CRB-12 FS                                                                                                    |
| CRB-12      | Procure/Mob Foundations/Ground Improvement/Final Design     | CRB-11 FS                                                                            | CRB-14 FS,"CRB-15 FS"                                                                                        |
| CRB-13      | In-Water Early Works (Install Trestle/ Shaft Reaction Pile) | CRB-10 FS                                                                            | CRB-14 FS, CRB-18 SS                                                                                         |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                               | Predecessor(s)                                       | Successor(s)                            |
|-------------|-------------------------------------------------------------|------------------------------------------------------|-----------------------------------------|
| CRB-14      | Columbia River Bridge In-Water Work                         | CRB-12 FS,"ENV-7 FS","CRB-13 FS"                     | CRB-15 FF558                            |
| CRB-15      | Columbia River Bridge Construction - Set Girders/Deck NB/SB | CRB-12 FS,"CRB-14 FF558","CRB-6b FF715","WHM-5" FF"  | CBA-7 FS,"CRB-17 FS"                    |
| CRB-16      | Complete CRB NB                                             |                                                      |                                         |
| CRB-17      | CRB Closeout                                                | CRB-15 FS                                            | PRG-2 FS                                |
|             |                                                             |                                                      |                                         |
| CBA-1       | CRB (Vancouver) Approaches Design/Agreements                | DES-1a FS                                            | CBA-2 FS                                |
| CBA-2       | CRB (Vancouver) Approaches RFQ                              | CBA-1 FS                                             | CBA-3a FS                               |
| CBA-3a      | Approaches Proposals/Selection (PDB)                        | CBA-2 FS                                             | CBA-3b FS                               |
| CBA-3b      | Approaches NTP #1                                           | CBA-3a FS                                            | CBA-3c FS                               |
| CBA-3c      | Approaches 30%-60% Design / Permitting                      | ENV-10 FF449,"CBA-3b FS"                             | CBA-3d FS                               |
| CBA-3d      | Approaches Final Design                                     | CBA-3c FS                                            | CBA-5 FS,"CBA-3e FS", CBA-3f            |
| CBA-3e      | BNSF Agreements (C&M, ROE)                                  | CBA-3d FS                                            | CBA-5 FS                                |
| CBA-3f      | Approaches GMP Negotiations                                 | , CBA-3d                                             | , CBA-5                                 |
|             |                                                             |                                                      |                                         |
| CBA-4       | CRB (Vancouver) Approaches Right of Way (incl. BNSF)        | ENV-5 FS,"ROW-1 FS"                                  | CBA-6 FF350                             |
| CBA-5       | CRB Approaches NTP for CN                                   | CIG-4' FS,"SRA-7 FS","CBA-3d FS","CBA-3e FS", CBA-3f | CBA-6 FS                                |
| CBA-6       | CRB Approaches Stage 1 Vancouver SB                         | CBA-5 FS,"CBA-4 FF350"                               | CBA-7 FS,"CBA-6' SS602"                 |
| CBA-6'      | CRB Approaches Stage 1 Vancouver SB Lag                     | CBA-6 SS602                                          | LRT-6 FS,"LRT-7 FS"                     |
| CBA-7       | CBRA Traffic Shift #1                                       | CRB-15 FS,"CBA-6 FS","HIA-5 FS"                      | CBA-7' FS,"CBA-8 FS","CBA-9 FS"         |
| CBA-7'      | CBRA Traffic Shift #1                                       | CBA-7 FS                                             | LRT-8 FS                                |
| CBA-8       | CRBA Vancouver Stages 2/3                                   | CBA-7 FS                                             | CBA-11 FS,"CBA-8.1 SS269","CBA-9 SF499" |
| CBA-8.1     | CRBA Vancouver Stage 2 Lag (ties to Waterfront P&R)         | CBA-8 SS269                                          | CBA-8.1'                                |
| CBA-8.1'    | CRBA Vancouver Stage 2 Lag (ties to Waterfront P&R)         | CBA-8.1                                              | WPR-7 FS                                |
| CBA-9       | Hayden Island Stages 1-3 (incl. Traffic Switch 4)           | CBA-7 FS,"HIG-6' FS","CBA-8 SF499"                   | CBA-10 FS,"CBA-5 FS"                    |
| CBA-10      | Hayden Island Stage 4                                       | CBA-9 FS                                             | CBA-11 FS, CBA-10'                      |
| CBA-10'     | Hayden Island Stage 4                                       | CBA-10                                               | OSB-7 FS,"OSB-8 FS"                     |
| CBA-11      | Vancouver Approaches Closeout                               | CBA-8 FS,"CBA-10 FS"                                 | PRG-2 FS, CBA-11'                       |
| CBA-11'     | Vancouver Approaches Closeout                               | CBA-11                                               | MPL-7 FS                                |
| CBA-12a     | Prep for CRB Partial Demo                                   |                                                      |                                         |
| CBA-12b     | CRB Partial Demo                                            |                                                      |                                         |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                                   | Predecessor(s)                                           | Successor(s)                     |
|-------------|-----------------------------------------------------------------|----------------------------------------------------------|----------------------------------|
| SRA-1       | SR 14 Package A Design to 100%/Permits/Agreements               | DES-1a FS                                                | SRA-4 FS,"SRA-2 FS"              |
| SRA-2       | SR 14 Package A Advance Utilities                               | SRA-1 FS                                                 | SRA-6 FS                         |
| SRA-3       | SR 14 Right of Way (incl. BNSF)                                 | ENV-5 FS                                                 | SRA-4 FS                         |
| SRA-4       | SR 14 Package A Ad                                              | ENV-10 FS,"SRA-3 FS","SRA-1 FS","ENV-5 FS"               | SRA-5 FS                         |
| SRA-5       | SR 14 Bid (DBB)                                                 | SRA-4 FS                                                 | SRA-7 FS,"SRA-6 FS"              |
| SRA-6       | SR 14 Package A NTP                                             | SRA-5 FS,"SRA-2 FS", ENV-5a                              | SRA-7 FS,"SRA-9 FS"              |
| SRA-7       | SR 14 Package A Construction                                    | SRA-5 FS,"SRA-6 FS","SRA-9 FF"                           | SRA-8 FS,"CBA-5 FS"              |
| SRA-8       | SR 14 Package A Closeout                                        | SRA-7 FS                                                 | PRG-2 FS                         |
| SRA-9       | Evergreen Bridge Construction                                   | SRA-6 FS                                                 | SRA-7 FF                         |
| HIA-0       | Hayden Island Package A Design to 100%/Permits/Agrmts/Utilities | DES-1a FS                                                | HIA-1 FS                         |
| HIA-1       | Hayden Island Package A Ad                                      | CIG-4' FS,"HIA-0 FS","ENV-11 FS","HIA-3 FS","PHT-4b' FS" | HIA-2 FS                         |
| HIA-2       | Hayden Island Package A Bid/Award (DBB)                         | HIA-1 FS                                                 | HIA-4 FS                         |
| HIA-3       | Hayden Island Right of Way                                      | ENV-5 FS                                                 | HIA-1 FS                         |
| HIA-4       | Hayden Island Package A NTP                                     | HIA-2 FS                                                 | HIA-5 FS                         |
| HIA-5       | Hayden Island Package A Construction                            | HIA-4 FS                                                 | CBA-7 FS,"LRT-10 FS","HIA-5' FS" |
| HIA-5'      | Hayden Island Package A Construction                            | HIA-5 FS                                                 | HIG-6 FS                         |
| HIG-1       | Hayden Island Guideway RFQ Prep/CPARB                           | DES-2 FS,"AGR-2 FS"                                      | HIG-2 FS                         |
| HIG-2       | Hayden Island Guideway Transit RFQ                              | HIG-1 FS,"ENV-5' FS","AGR-4 FS", Date: 9/27/2026         | HIG-3 FS                         |
| HIG-3       | Hayden Island Guideway Transit Selection/Final Design           | HIG-2 FS,"HIG-4 FF29","PHT-4b FF119","DES-4 FF577"       | HIG-5 FS                         |
| HIG-4       | Hayden Island Guideway Transit Right of Way                     | ENV-5' FS,"DES-2 FS"                                     | HIG-3 FF29                       |
| HIG-5       | Hayden Island Guideway Transit GMP/Award                        | HIG-3 FS                                                 | HIG-6 FS                         |
| HIG-6       | Hayden Island Guideway Transit Construction                     | HIG-5 FS,"HIA-5' FS"                                     | LRT-10 FS,"HIG-6' FS"            |
| HIG-6'      | Hayden Island Guideway Transit Construction                     | HIG-6 FS                                                 | CBA-9 FS                         |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                                            | Predecessor(s)                                                                    | Successor(s)                                          |
|-------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------|
| CBR-1       | CRB Bridge Removal Design/Permits/Utilities/Cultural Resources           | DES-1a FS                                                                         | CBR-3 FS,"CBR-2 SS481"                                |
| CBR-2       | CRB Bridge Removal Right of Way                                          | ENV-5 FS,"CBR-1 SS481","ROW-1 FS"                                                 | CBR-3 FS                                              |
| CBR-3       | CRB Bridge Removal Ad                                                    | CBR-1 FS,"CBR-2 FS"                                                               | CBR-4 FS                                              |
| CBR-4       | CRB Bridge Removal Bid/Award (DBB)                                       | CBR-3 FS                                                                          | CBR-5 FS                                              |
| CBR-5       | CRB Bridge Removal NTP                                                   | CBR-4 FS,"CBA-9 FS"                                                               | CBR-6 FS                                              |
| CBR-6       | Interstate Bridge Removal Construction                                   | CBR-5 FS                                                                          | CBR-7 SS183,"CBR-8 FS"                                |
| CBR-7       | Interstate Bridge Removal Construction - In-Water work                   | CBR-6 SS183                                                                       | CBR-8 FS                                              |
| CBR-8       | Interstate Bridge Removal Construction                                   | CBR-6 FS,"CBR-7 FS"                                                               | PRG-2 FS                                              |
|             |                                                                          |                                                                                   |                                                       |
| LRT-0       | Program-Wide Transit RFP Prep/CPARB                                      | DES-2 FS,"AGR-2 FS"                                                               | LRT-1 FS                                              |
| LRT-1       | Program-Wide Transit RFQ                                                 | LRT-0 FS,"ENV-5' FS", Date: 7/8/2026                                              | LRT-2 FS                                              |
| LRT-2       | Program-Wide Transit Selection/ Permits/ Utilities/ Negotiations (CM/GC) | LRT-1 FS,"DES-4 FF327"                                                            | LRT-3 SS912                                           |
| LRT-3       | Program-Wide Transit GMP/Award (GC/CM)                                   | CIG-4 FS,"LRT-2 SS912"                                                            | LRT-6 FS,"LRT-7 FS","LRT-8 FS","LRT-9 FS","LRT-10 FS" |
| LRT-4a      | Right of Way for Transit (Track/Systems/Stations): Oregon                | ENV-5' FS,"DES-2 FS"                                                              | LRT-6 FS,"LRT-9 FS","LRT-10 FS"                       |
| LRT-4b      | Right of Way for Transit (Track/Systems/Stations): Washington            | ENV-5' FS,"DES-2 FS"                                                              | LRT-6 FS,"LRT-7 FS"                                   |
|             |                                                                          |                                                                                   |                                                       |
| LRT-6       | Plinths and Track Construction                                           | LRT-3 FS,"LRT-4b FS","LRT-4a FS","CBA-6' FS","PHT-9 FS","LRT-9 SS60","LRF-5 FF91" | LRT-11 SS180,"LRT-12 FS"                              |
| LRT-7       | Waterfront Station Construction                                          | LRT-3 FS,"LRT-4b FS","CBA-6' FS"                                                  | WAF-5 FS,"LRT-12 FS"                                  |
| LRT-8       | Evergreen Station Construction                                           | LRT-3 FS,"CBA-7' FS"                                                              | LRT-12 FS,"WAF-5 FS", LRT-8'                          |
| LRT-8'      | Evergreen Station Construction                                           | LRT-8                                                                             | EPR-7 FS                                              |
| LRT-9       | Expo Station Construction                                                | LRT-3 FS,"MDA-5 FS","LRT-4a FS"                                                   | ORF-5 FS,"LRT-12 FS","LRT-6 SS60"                     |
| LRT-10      | Hayden Island Station Construction                                       | LRT-4a FS,"PHT-9 FS","HIA-5 FS","HIG-6 FS","LRT-3 FS"                             | LRT-12 FS,"ORF-5 FS"                                  |
| LRT-11      | Systems Construction                                                     | LRT-6 SS180                                                                       | LRT-12 FS                                             |
| LRT-12      | Testing & Commissioning                                                  | LRT-11 FS,"LRT-7 FS","LRT-8 FS","LRT-9 FS","LRT-10 FS","LRT-6 FS","LRF-7 FS"      | LRT-14 FS,"LRT-13 SS365"                              |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                                                              | Predecessor(s)                                         | Successor(s)                           |
|-------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------|
| LRT-13      | Operator Training / Route Simulation                                                       | LRT-12 SS365                                           | LRT-14 FS                              |
| LRT-14      | Transit Revenue Service Date                                                               | WAF-5 FS,"ORF-5 FS","LRT-12 FS","RJT-6 FS","LRT-13 FS" | PRG-2 FS                               |
|             |                                                                                            |                                                        |                                        |
| MDA-0       | Marine Drive Package A RFQ Prep/CPARB                                                      | DES-2 FS,"AGR-2 FS"                                    | MDA-1 FS                               |
| MDA-1       | Marine Drive Package A RFQ                                                                 | MDA-0 FS,"ENV-5' FS","AGR-4 FS", Date: 7/10/2026       | MDA-2 FS                               |
| MDA-2       | Marine Drive Package A Selection/Design (CM/GC)                                            | MDA-1 FS,"MDA-3 FF120","DES-4 FF600"                   | MDA-4 FS                               |
| MDA-3       | Marine Drive Package A Right of Way                                                        | ENV-5 FS,"DES-2 FS"                                    | MDA-2 FF120                            |
| MDA-4       | Marine Drive Package A GMP/Award                                                           | MDA-2 FS                                               | MDA-5 FS                               |
| MDA-5       | Marine Drive Package A Construction                                                        | MDA-4 FS,"PHT-7 SS"                                    | LRT-9 FS,"LRF-4 SS121"                 |
|             |                                                                                            |                                                        |                                        |
| LRF-0       | LRF Overnight Facility RFQ Prep/CPARB                                                      | DES-2 FS,"AGR-2 FS"                                    | LRF-1 FS                               |
| LRF-1       | LRT Overnight Facility RFQ                                                                 | DES-2 FS,"LRF-0 FS","ENV-5' FS","AGR-4 FS"             | LRF-2 FS                               |
| LRF-2       | LRT Overnight Facility Selection/Design (CM/GC)                                            | LRF-1 FS,"DES-4 FF90"                                  | LRF-3 FS                               |
| LRF-3       | LRT Overnight Facility GMP/Award                                                           | LRF-2 FS,"CIG-4 FS"                                    | LRF-4 FS                               |
| LRF-4       | LRT Overnight Facility Construction                                                        | LRF-3 FS,"MDA-5 SS121"                                 | LRF-5 FS                               |
| LRF-5       | LRT Overnight Facility TriMet Move                                                         | LRF-4 FS,"LRV-6 FF"                                    | LRT-6 FF91                             |
| LRF-6       | LRT Overnight Facility Right of Way                                                        |                                                        |                                        |
|             |                                                                                            |                                                        |                                        |
| PHT-1       | North Portland Harbor Transit RFQ Prep/CPARB                                               | DES-2 FS,"AGR-2 FS"                                    | PHT-2 FS                               |
| PHT-2       | North Portland Harbor Transit RFQ                                                          | DES-2 FS,"PHT-1 FS","ENV-5' FS","AGR-4 FS"             | PHT-5 FS                               |
| PHT-3       | North Portland Harbor Transit Right of Way                                                 | ENV-5' FS,"DES-2 FS"                                   | PHT-5 FF123                            |
| PHT-4a      | USACE / USCG Permits for NPH Transit / Marine Drive                                        | ENV-5' FS,"DES-4 FF418"                                | PHT-6 FS,"PHT-4b SS1063"               |
| PHT-4b      | North Portland Harbor Transit Permit (USACE)                                               | PHT-4a SS1063                                          | PHT-4b' FS,"HIG-3 FF119","PHT-5 FF123" |
| PHT-4b'     | North Portland Harbor Transit Permit (USACE)                                               | PHT-4b FS                                              | HIA-1 FS                               |
| PHT-5       | North Portland Harbor Transit Selection/ Design/ Permitting/ Utilities, Cultural Resources | PHT-2 FS,"PHT-3 FF123","PHT-4b FF123"                  | PHT-6 FS                               |
| PHT-6       | North Portland Harbor Transit GMP/Award                                                    | PHT-5 FS,"CIG-4 FS","PHT-4a FS"                        | PHT-7 FS,"PHT-8 FS"                    |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                                | Predecessor(s)                    | Successor(s)          |
|-------------|--------------------------------------------------------------|-----------------------------------|-----------------------|
| PHT-7       | North Portland Harbor Transit Construction                   | PHT-6 FS, "PHT-8 FF329"           | MDA-5 SS, "PHT-9 FS"  |
| PHT-8       | North Portland Harbor Transit Construction - In-Water Work   | PHT-6 FS                          | PHT-7 FF329           |
| PHT-9       | North Portland Harbor Transit Construction Closeout          | PHT-7 FS                          | LRT-10 FS, "LRT-6 FS" |
|             |                                                              |                                   |                       |
| WAF-1       | WA Station Finishes Design/Utilities                         | DES-2 FS                          | WAF-2 FS              |
| WAF-2       | WA Station Finishes Ad                                       | WAF-1 FS, Date: 7/12/2029         | WAF-3 FS              |
| WAF-3       | WA Station Finishes Bid (DBB)                                | WAF-2 FS                          | WAF-4 FS              |
| WAF-4       | WA Station Finishes NTP                                      | WAF-3 FS, "CIG-4 FS"              | WAF-5 FS              |
| WAF-5       | WA Station Finishes Construction                             | LRT-7 FS, "WAF-4 FS", "LRT-8 FS"  | LRT-14 FS             |
|             |                                                              |                                   |                       |
| ORF-1       | OR Station Finishes Design/Utilities                         | DES-2 FS                          | ORF-2 FS              |
| ORF-2       | OR Station Finishes Ad                                       | ORF-1 FS, Date: 7/12/2029         | ORF-3 FS              |
| ORF-3       | OR Station Bid (DBB)                                         | ORF-2 FS                          | ORF-4 FS              |
| ORF-4       | OR Station Finishes NTP                                      | ORF-3 FS, "CIG-4 FS"              | ORF-5 FS              |
| ORF-5       | OR Station Finishes Construction                             | LRT-9 FS, "ORF-4 FS", "LRT-10 FS" | LRT-14 FS             |
|             |                                                              |                                   |                       |
| RJT-1       | Ruby Junction TriMet Facility RFQ Prep                       | DES-2 FS, "AGR-2 FS"              | RJT-2 FS              |
| RJT-2       | Ruby Junction TriMet Facility RFQ                            | RJT-1 FS, "ENV-5' FS", "AGR-4 FS" | RJT-3 FS              |
| RJT-3       | Ruby Junction TriMet Facility Selection/Final Design (GC/CM) | RJT-2 FS, "DES-4 FF346"           | RJT-5 FS              |
| RJT-4       | Ruby Junction Right of Way                                   | ENV-5' FS, "DES-2 FS"             | RJT-5 FS              |
| RJT-5       | Ruby Junction GMP/Award                                      | RJT-3 FS, "CIG-4 FS", "RJT-4 FS"  | RJT-6 FS              |
| RJT-6       | Ruby Junction Construction / TriMet Move                     | RJT-5 FS                          | LRT-14 FS, "LRV-5 FF" |
|             |                                                              |                                   |                       |
| CBF-1       | 65th St. CTRAN O&M Bus Facility Design                       | DES-2 FS                          | CBF-3 FS              |
| CBF-2       | 65th St. CTRAN O&M Bus Facility Right of Way                 |                                   |                       |
| CBF-3       | 65th St. CTRAN O&M Bus Facility Ad                           | CBF-1 FS, Date: 7/12/2029         | CBF-4 FS              |
| CBF-4       | 65th St. CTRAN O&M Bus Facility Bid (DBB)                    | CBF-3 FS                          | CBF-5 FS, "CBF-6 FS"  |
| CBF-5       | 65th St. CTRAN O&M Bus Facility NTP                          | CBF-4 FS, "CIG-4 FS"              | CBF-6 FS              |
| CBF-6       | 65th St. CTRAN O&M Bus Facility Construction                 | CBF-4 FS, "CBF-5 FS"              | CBP-5 FF              |
|             |                                                              |                                   |                       |
| LRV-1       | Develop LRV Specifications                                   | DES-1a' FS                        | LRV-2 FS              |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                                      | Predecessor(s)                                      | Successor(s)                                       |
|-------------|--------------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------|
| LRV-2       | Light Rail Vehicles RFP                                            | LRV-1 FS,"CIG-2 FS","ENV-5' FS",<br>Date: 11/1/2027 | LRV-3 FS                                           |
| LRV-3       | Light Rail Vehicles Procurement                                    | LRV-2 FS                                            | LRV-4 FS                                           |
| LRV-4       | Light Rail Vehicles NTP                                            | LRV-3 FS,"CIG-4 FS"                                 | LRV-5 FS                                           |
| LRV-5       | Light Rail Vehicles Manufacture,<br>Deliver Group One              | LRV-4 FS,"RJT-6 FF"                                 | LRV-6 FS                                           |
| LRV-6       | Light Rail Vehicles Test, Commission<br>Group One                  | LRV-5 FS                                            | LRF-5 FF,"LRV-7 FS"                                |
| LRV-7       | Light Rail Vehicles<br>Deliver/Commission Remaining 17<br>Vehicles | LRV-6 FS                                            | LRT-12 FS                                          |
|             |                                                                    |                                                     |                                                    |
| CBP-1       | Bus Procurement Design                                             | DES-2 FS                                            | CBP-2 FS                                           |
| CBP-2       | Bus Procurement Ad                                                 | CBP-1 FS,"ENV-5' FS"                                | CBP-3 FS                                           |
| CBP-3       | Bus Procurement Bid (DBB)                                          | CBP-2 FS                                            | CBP-4 FS                                           |
| CBP-4       | Bus Procurement NTP                                                | CBP-3 FS                                            | CBP-5 FS                                           |
| CBP-5       | Bus Procurement<br>Fabrication/Delivery/Testing                    | CBP-4 FS,"CBF-6 FF"                                 |                                                    |
|             |                                                                    |                                                     |                                                    |
| CBS-1       | Bus Shelters Design / Utilities                                    | DES-2 FS                                            | CBS-2 FS                                           |
| CBS-2       | Bus Shelters Ad                                                    | CBS-1 FS, Date: 7/12/2029                           | CBS-3 FS                                           |
| CBS-3       | Bus Shelters Bid (DBB)                                             | CBS-2 FS                                            | CBS-4 FS                                           |
| CBS-4       | Bus Shelters NTP                                                   | CBS-3 FS,"CIG-4 FS"                                 | CBS-5 FS                                           |
| CBS-5       | Bus Shelters Construction                                          | CBS-4 FS                                            |                                                    |
| CBS-6       | Bus Shelters Right of Way                                          |                                                     |                                                    |
|             |                                                                    |                                                     |                                                    |
| MDI-1       | Marine Drive Interchange Design /<br>RFQ Prep                      | DES-1a" FS, Date: 4/24/2035                         | MDI-2 FS,"MDI-4 SS367"                             |
| MDI-2       | Marine Drive Interchange RFQ                                       | MDI-1 FS, Date: 4/24/2039                           | MDI-3 FS                                           |
| MDI-3       | Marine Drive Interchange Selection<br>(CM/GC) / Final Design       | MDI-2 FS,"MDI-4 FF224"                              | MDI-5 FS                                           |
| MDI-4       | Marine Drive Interchange Right of<br>Way                           | ENV-5" FS,"MDI-1 SS367"                             | MDI-3 FF224                                        |
| MDI-5       | Marine Drive Interchange<br>GMP/Award                              | MDI-3 FS                                            | MDI-6 FS                                           |
| MDI-6       | Marine Drive Interchange<br>Construction                           | MDI-5 FS,"ONB-7 SS820"                              | NER-6 SS520,"NER-6 FF","HIS-6<br>FF","HIS-6 SS275" |
|             |                                                                    |                                                     |                                                    |
| NER-1       | N. Expo Road Design                                                | DES-1a" FS, Date: 9/7/2038                          | NER-3 FS,"NER-2 SS589"                             |
| NER-2       | N. Expo Road Right of Way                                          | ENV-5" FS,"NER-1 SS589"                             | NER-3 FS                                           |
| NER-3       | N. Expo Road Ad                                                    | NER-1 FS,"NER-2 FS"                                 | NER-4 FS                                           |
| NER-4       | N. Expo Road Bid (DBB)                                             | NER-3 FS                                            | NER-5 FS                                           |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                                                                    | Predecessor(s)                      | Successor(s)           |
|-------------|--------------------------------------------------------------------------------------------------|-------------------------------------|------------------------|
| NER-5       | N. Expo Road NTP                                                                                 | NER-4 FS                            | NER-6 FS               |
| NER-6       | N. Expo Road Construction                                                                        | NER-5 FS,"MDI-6 SS520","MDI-6 FF"   | PRG-3 FS               |
|             |                                                                                                  |                                     |                        |
| OSB-1       | Oregon I-5 SB RFQ Prep                                                                           | DES-1a" FS, Date: 12/1/2029         | OSB-2 FS               |
| OSB-2       | Oregon I-5 SB RFQ                                                                                | OSB-1 FS                            | OSB-3 FS               |
| OSB-3       | Oregon I-5 SB Selection/Final Design (CM/GC) - incl. permitting, env.                            | OSB-2 FS                            | OSB-6 FS,"OSB-4 SS372" |
| OSB-4       | Oregon I-5 SB Right of Way                                                                       | ENV-5" FS,"OSB-3 SS372"             | OSB-6 FS               |
| OSB-6       | Oregon I-5 SB GMP/Award                                                                          | OSB-3 FS,"OSB-4 FS"                 | OSB-7 FS,"OSB-8 FS"    |
| OSB-7       | Oregon I-5 SB Construction                                                                       | OSB-6 FS,"CBA-10' FS","OSB-8 FF245" | PHD-5 FS,"OSB-9 FS"    |
| OSB-8       | Oregon I-5 SB Construction - In-Water Work                                                       | CBA-10' FS,"OSB-6 FS"               | OSB-7 FF245            |
| OSB-9       | Oregon I-5 SB Closeout                                                                           | OSB-7 FS                            | PRG-3 FS               |
|             |                                                                                                  |                                     |                        |
| PHD-1       | N. Portland Harbor Bridge Demo Design / Utilities / Cultural Resources                           | DES-1a" FS, Date: 10/6/2032         | PHD-2 FS               |
| PHD-2       | N. Portland Harbor Bridge Demo Ad                                                                | PHD-1 FS                            | PHD-3 FS               |
| PHD-3       | N. Portland Harbor Bridge Demo Bid (DBB)                                                         | PHD-2 FS                            | PHD-4 FS               |
| PHD-4       | N. Portland Harbor Bridge Demo NTP                                                               | PHD-3 FS                            | PHD-5 FS               |
| PHD-5       | N. Portland Harbor Bridge Demolition                                                             | OSB-7 FS,"PHD-4 FS"                 | ONB-7 FS               |
| PHD-6       | N. Portland Harbor Bridge Demo Right of Way                                                      |                                     |                        |
|             |                                                                                                  |                                     |                        |
| ONB-1       | Oregon I-5 NB RFQ Prep                                                                           | DES-1a" FS, Date: 10/31/2035        | ONB-2 FS               |
| ONB-2       | Oregon I-5 NB RFQ                                                                                | ONB-1 FS                            | ONB-3 FS               |
| ONB-3       | Oregon I-5 NB Selection (CM/GC) / Final Design - incl. Permitting, Utilities, Cultural Resources | ONB-2 FS                            | ONB-6 FS,"ONB-4 SS37"  |
| ONB-4       | Oregon I-5 NB Right of Way                                                                       | ONB-3 SS37                          | ONB-6 FS               |
| ONB-6       | Oregon I-5 NB GMP/Award                                                                          | ONB-3 FS,"ONB-4 FS"                 | ONB-7 FS               |
| ONB-7       | Oregon I-5 NB Construction                                                                       | ONB-6 FS,"PHD-5 FS"                 | MDI-6 SS820,"PRG-3 FS" |
|             |                                                                                                  |                                     |                        |
| HIS-1       | Hayden Island Surface Street Design to 100%                                                      | DES-1a" FS, Date: 7/6/2037          | HIS-3 FS,"HIS-2 SS589" |
| HIS-2       | Hayden Island Surface Street Right of Way                                                        | ENV-5" FS,"HIS-1 SS589"             | HIS-3 FS               |
| HIS-3       | Hayden Island Surface Street Ad                                                                  | HIS-1 FS,"HIS-2 FS"                 | HIS-4 FS               |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                          | Predecessor(s)                      | Successor(s)            |
|-------------|--------------------------------------------------------|-------------------------------------|-------------------------|
| HIS-4       | Hayden Island Surface Street Bid (DBB)                 | HIS-3 FS                            | HIS-5 FS                |
| HIS-5       | Hayden Island Surface Street NTP                       | HIS-4 FS                            | HIS-6 FS                |
| HIS-6       | Hayden Island Surface Street Construction Complete     | HIS-5 FS, "MDI-6 FF", "MDI-6 SS275" | PRG-3 FS                |
|             |                                                        |                                     |                         |
| EPR-1       | Evergreen P&R Agreements/Utilities/Cultural Resources  | DES-2' FS, Date: 4/1/2029           | EPR-3 FS                |
| EPR-2       | Evergreen P&R Right of Way                             | ENV-5" FS, Date: 4/1/2029           | EPR-3 FS                |
| EPR-3       | Evergreen P&R RFP                                      | EPR-1 FS, "EPR-2 FS"                | EPR-4 FS                |
| EPR-4       | Evergreen P&R Procurement (DB)                         | EPR-3 FS                            | EPR-5 FS                |
| EPR-5       | Evergreen P&R NTP                                      | EPR-4 FS                            | EPR-6 FS                |
| EPR-6       | Evergreen P&R Final Design/ Permits                    | EPR-5 FS                            | EPR-7 FS                |
| EPR-7       | Evergreen P&R Construction                             | EPR-6 FS, "LRT-8' FS"               | PRG-3 FS                |
|             |                                                        |                                     |                         |
| WPR-1       | Waterfront P&R Agreements/Utilities/Cultural Resources | DES-2' FS, Date: 1/1/2029           | WPR-3 FS                |
| WPR-2       | Waterfront P&R Right of Way                            | ENV-5" FS, Date: 1/1/2029           | WPR-3 FS                |
| WPR-3       | Waterfront P&R RFP                                     | WPR-1 FS, "WPR-2 FS"                | WPR-4 FS                |
| WPR-4       | Waterfront P&R Procurement (DB)                        | WPR-3 FS                            | WPR-5 FS                |
| WPR-5       | Waterfront P&R NTP                                     | WPR-4 FS                            | WPR-6 FS                |
| WPR-6       | Waterfront P&R Final Design/ Permits                   | WPR-5 FS                            | WPR-7 FS                |
| WPR-7       | Waterfront P&R Construction                            | WPR-6 FS, "CBA-8.1' FS"             | PRG-3 FS                |
|             |                                                        |                                     |                         |
| MPL-1       | Mill Plain Agreements/Utilities/Arch.                  | DES-1a" FS, Date: 6/6/2029          | MPL-3 FS, "MPL-2 SS917" |
| MPL-2       | Mill Plain Right of Way                                | ENV-5" FS, "MPL-1 SS917"            | MPL-3 FS                |
| MPL-3       | Mill Plain RFP                                         | MPL-2 FS, "MPL-1 FS"                | MPL-4 FS                |
| MPL-4       | Mill Plain Procurement (DB)                            | MPL-3 FS                            | MPL-5 FS                |
| MPL-5       | Mill Plain NTP                                         | MPL-4 FS                            | MPL-6 FS                |
| MPL-6       | Mill Plain Final Design/ Permits                       | MPL-5 FS                            | MPL-7 FS                |
| MPL-7       | Mill Plain Construction                                | MPL-6 FS, "CBA-11' FS"              | WAN-7 SS305, "PRG-3 FS" |
|             |                                                        |                                     |                         |
| WAN-1       | Washington North Agreements/Utilities/CR               | DES-1a" FS, Date: 6/4/2031          | WAN-3 FS, "WAN-2 SS190" |
| WAN-2       | Washington North Right of Way                          | ENV-5" FS, "WAN-1 SS190"            | WAN-3 FS                |
| WAN-3       | Washington North RFP                                   | WAN-1 FS, "WAN-2 FS"                | WAN-4 FS                |
| WAN-4       | Washington North Procurement (DB)                      | WAN-3 FS                            | WAN-5 FS                |
| WAN-5       | Washington North NTP                                   | WAN-4 FS                            | WAN-6 FS                |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                              | Predecessor(s)             | Successor(s) |
|-------------|------------------------------------------------------------|----------------------------|--------------|
| WAN-6       | Washington North Final Design/<br>Permits                  | WAN-5 FS                   | WAN-7 FS     |
| WAN-7       | Washington North Construction                              | WAN-6 FS,"MPL-7 SS305"     | PRG-3 FS     |
|             |                                                            |                            |              |
| PCT-1       | Preconstruction Tolling<br>Design/Utilities                |                            | PCT-2 FS     |
| PCT-2       | Preconstruction Tolling Ad                                 | PCT-1 FS                   | PCT-3 FS     |
| PCT-3       | Preconstruction Tolling Bid (DBB)                          | PCT-2 FS                   | PCT-4 FS     |
| PCT-4       | Preconstruction Tolling NTP                                | PCT-3 FS                   | PCT-5 FS     |
| PCT-5       | Preconstruction Tolling<br>Construction / Toll Integration | PCT-4 FS                   | FIN-3 FS     |
|             |                                                            |                            |              |
| WHM-1       | West Hayden Island Mitigation<br>Design/Utilities          | DES-1a" FS, Date: 8/1/2037 | WHM-2 FS     |
| WHM-2       | West Hayden Island Mitigation Ad                           | WHM-1 FS,"WHM-6 FS"        | WHM-3 FS     |
| WHM-3       | West Hayden Island Mitigation Bid<br>(DBB)                 | WHM-2 FS                   | WHM-4 FS     |
| WHM-4       | West Hayden Island Mitigation NTP                          | WHM-3 FS                   | WHM-5 FS     |
| WHM-5       | West Hayden Island Mitigation<br>Construction              | WHM-4 FS                   | WHM-5' FS    |
| WHM-5'      | West Hayden Island Mitigation<br>Construction              | WHM-5 FS                   | WHM-5" FS    |
| WHM-5"      | West Hayden Island Mitigation<br>Construction              | WHM-5' FS                  | CRB-15 FF    |
| WHM-6       | West Hayden Island Mitigation Right<br>of Way              | ENV-5" FS                  | WHM-2 FS     |
|             |                                                            |                            |              |
| CRB-18      | River Bridge Mitigation Cost                               | , CRB-13 SS                |              |

## Appendix D – Cost Estimate Summary

## Cost Estimate Validation Process (CEVP) Report

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The following materials provide additional backup for the cost estimate and probabilistic cost and schedule risk analysis inputs:

- Figure D-1: Cost Estimate Summary
- Table D-1: Base Unit Price Uncertainty Ranges by Cost Item
- Figure D-2: Base Uncertainty Ranges by Package (Unit Price and Quantity)
- Figure D-3: Base Uncertainty Ranges by Package (Percentage Markups)
- Figure D-4: Base Uncertainty Ranges by Package (PE and Right of Way)
- Figure D-5: Correlation Matrices
- Table D-2: Summary of Base Cost-Loaded Schedule

## Cost Estimate Validation Process (CEVP) Report

### Figure D-1. Cost Estimate Summary

| Program                                                                               | Interstate Bridge Replacement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |                   |                              | Date               | 11/5/2025                   |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------|------------------------------|--------------------|-----------------------------|
| Location:                                                                             | Portland, OR & Vancouver, WA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |                   |                              | Estimator          | GEC Team                    |
| Description:                                                                          | The IBR Program is a multi-modal infrastructure initiative spanning Oregon and Washington, focused on replacing the aging I-5 bridge and improving safety, mobility, and seismic resilience along a critical five-mile stretch of the West Coast's primary north-south corridor. With 29 integrated work packages, the program includes new fixed-span bridges over the Columbia River, expanded highway interchanges, a light rail extension with new stations, and major transit and active transportation enhancements. |        |                   |                              | Estimate Purpose   | Scoping Estimate; 2025 CEVP |
| Estimated Costs Below Represent the: Escalated Base Year Dollars, No Risk Contingency |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |                   |                              |                    |                             |
| Programmatic Cost Estimate                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |                   |                              |                    |                             |
| (Pkg. 0)                                                                              | Programmatic Costs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        | Unit              | Quantity                     | Unit Cost          | \$692,881,728               |
|                                                                                       | IBR Costs To date (Actuals)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        | LS                | 1                            | \$236,591,728      | \$236,591,728               |
|                                                                                       | Anticipated Programmatic Costs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        | MO                | 231                          | \$1,975,281        | \$456,290,000               |
| CONSTRUCTION AND PROCUREMENT PACKAGE COSTS                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |                   |                              |                    |                             |
| Package No.                                                                           | Package Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | PCT    | Construction (CN) | Preliminary Engineering (PE) | Right-of-Way (ROW) | Total                       |
|                                                                                       | Packages (1-29)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 100.0% | \$5,844,510,000   | \$965,702,000                | \$307,153,000      | \$7,117,365,000             |
| 1                                                                                     | 65th Street CTRAN O&M Bus Facility                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0.2%   | \$10,124,000      | \$2,466,000                  | \$0                | \$12,590,000                |
| 2                                                                                     | Bus Procurement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.2%   | \$9,823,000       | \$874,000                    | \$0                | \$10,697,000                |
| 3                                                                                     | Bus Shelters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.0%   | \$1,024,000       | \$361,000                    | \$0                | \$1,385,000                 |
| 4                                                                                     | Approaches                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 18.7%  | \$1,130,943,000   | \$148,050,000                | \$50,447,000       | \$1,329,440,000             |
| 5                                                                                     | Columbia River Bridge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 25.9%  | \$1,584,642,000   | \$222,268,000                | \$36,999,000       | \$1,843,909,000             |
| 6                                                                                     | Columbia River Bridge Removal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3.3%   | \$207,503,000     | \$24,715,000                 | \$1,374,000        | \$233,592,000               |
| 7                                                                                     | Evergreen Park & Ride                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1.1%   | \$57,879,000      | \$12,639,000                 | \$7,940,000        | \$78,458,000                |
| 8                                                                                     | Hayden Island Guideway                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.8%   | \$80,878,000      | \$16,320,000                 | \$34,192,000       | \$131,390,000               |
| 9                                                                                     | Hayden Island Package A (Hayden Island Center)                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.6%   | \$18,792,000      | \$2,543,000                  | \$19,644,000       | \$40,979,000                |
| 10                                                                                    | Hayden Island Surface Streets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.3%   | \$66,556,000      | \$15,864,000                 | \$7,142,000        | \$89,562,000                |
| 11                                                                                    | Light Rail Overnight Facility                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.1%   | \$63,820,000      | \$12,460,000                 | \$0                | \$76,280,000                |
| 12                                                                                    | LRV Procurement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2.3%   | \$150,497,000     | \$9,805,000                  | \$0                | \$160,302,000               |
| 13                                                                                    | Marine Drive Interchange                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5.2%   | \$289,771,000     | \$71,332,000                 | \$10,976,000       | \$372,079,000               |
| 14                                                                                    | Marine Drive Package A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2.4%   | \$113,508,000     | \$25,255,000                 | \$33,803,000       | \$172,566,000               |
| 15                                                                                    | Mill Plain Interchange                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3.0%   | \$174,253,000     | \$36,404,000                 | \$2,037,000        | \$212,694,000               |
| 16                                                                                    | North Expo Road                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.3%   | \$16,634,000      | \$3,391,000                  | \$135,000          | \$20,160,000                |
| 17                                                                                    | North Portland Harbor Bridge Removal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.5%   | \$28,905,000      | \$6,349,000                  | \$0                | \$35,254,000                |
| 18                                                                                    | North Portland Harbor Transit Bridge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.3%   | \$53,488,000      | \$10,410,000                 | \$28,251,000       | \$92,149,000                |
| 19                                                                                    | Oregon I-5 Northbound                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 7.4%   | \$429,863,000     | \$82,103,000                 | \$16,209,000       | \$528,175,000               |
| 20                                                                                    | Oregon I-5 Southbound                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 7.2%   | \$430,556,000     | \$81,960,000                 | \$0                | \$512,516,000               |
| 21                                                                                    | Oregon Station Finishes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.0%   | \$148,000         | \$72,000                     | \$0                | \$220,000                   |
| 22                                                                                    | Pre-Completion Tolling Signage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.7%   | \$36,240,000      | \$10,138,000                 | \$0                | \$46,378,000                |
| 23                                                                                    | Ruby Junction TriMet Facility Expansion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4.6%   | \$260,103,000     | \$51,329,000                 | \$15,448,000       | \$326,880,000               |
| 24                                                                                    | SR-14 Package A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.7%   | \$81,884,000      | \$12,905,000                 | \$23,311,000       | \$118,100,000               |
| 25                                                                                    | Track, Systems & Stations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5.4%   | \$318,377,000     | \$64,862,000                 | \$0                | \$383,239,000               |
| 26                                                                                    | Washington Station Finishes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.0%   | \$155,000         | \$50,000                     | \$0                | \$205,000                   |
| 27                                                                                    | Washington North                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3.0%   | \$170,579,000     | \$31,085,000                 | \$14,499,000       | \$216,163,000               |
| 28                                                                                    | Waterfront Park & Ride                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.0%   | \$57,565,000      | \$9,692,000                  | \$2,383,000        | \$69,640,000                |
| 29                                                                                    | West Hayden Island Mitigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.0%   | \$0               | \$0                          | \$2,363,000        | \$2,363,000                 |
|                                                                                       | Construction and Procurement Package Total                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 100%   | \$5,844,510,000   | \$965,702,000                | \$307,153,000      | \$7,117,365,000             |
|                                                                                       | Total Program Costs (Rounded)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |                   |                              |                    | \$7,810,250,000             |
| PROGRAM SUMMARIES                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |                   |                              |                    |                             |
|                                                                                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PCT    | Construction (CN) | Preliminary Engineering (PE) | Right-of-Way (ROW) | Total                       |
|                                                                                       | Washington Total                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 40.4%  | \$2,663,850,162   | \$389,417,000                | \$105,511,000      | \$3,158,778,162             |
|                                                                                       | Oregon Total                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 50.7%  | \$3,180,660,000   | \$576,285,000                | \$201,642,000      | \$3,958,587,000             |
|                                                                                       | Programmatic Costs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8.9%   | \$0               | \$0                          | \$0                | \$692,881,728               |
| All                                                                                   | Total (Rounded)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 100%   | \$5,844,510,162   | \$965,702,000                | \$307,153,000      | \$7,810,250,000             |
|                                                                                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PCT    | Construction (CN) | Preliminary Engineering (PE) | Right-of-Way (ROW) | Total                       |
|                                                                                       | Highway Total                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 67.5%  | \$4,404,215,906   | \$718,137,292                | \$151,397,489      | \$5,273,750,686             |
|                                                                                       | Transit Total                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 23.6%  | \$1,440,294,256   | \$247,564,708                | \$155,755,511      | \$1,843,614,476             |
|                                                                                       | Programmatic Costs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8.9%   | \$0               | \$0                          | \$0                | \$692,881,728               |
| All                                                                                   | Total (Rounded)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 100%   | \$5,844,510,162   | \$965,702,000                | \$307,153,000      | \$7,810,250,000             |

#### Notes:

1. CEVP base cost includes an additional \$1.6 million in prior costs.
2. Values exclude inflation and contingency.

Table D-1. Base Unit Price Uncertainty Ranges by Cost Item

| Item Number | Description                                           | Total Cost (millions of July 2025 dollars) | Percentage of Direct Construction Cost Total | Unit Price (July 2025 dollars) | Lower Range (10th Percentile) | Most Likely Value | Upper Range (90th Percentile) |
|-------------|-------------------------------------------------------|--------------------------------------------|----------------------------------------------|--------------------------------|-------------------------------|-------------------|-------------------------------|
| 9930        | Superstructure Steel, CRB                             | 436.6                                      | 11.2%                                        | 8.03                           | 0.0%                          | 16.6%             | 33.1%                         |
| 9930        | Superstructure Steel                                  | 393.8                                      | 10.1%                                        | 4.75                           | 0.0%                          | 17.4%             | 34.7%                         |
| 4325        | Superstructure Concrete                               | 200.6                                      | 5.1%                                         | 1,673.10                       | 0.0%                          | 11.0%             | 22.0%                         |
| 4092        | Foundation Shafts, 120" Diameter                      | 158.0                                      | 4.0%                                         | 4,943.75                       | 0.0%                          | 6.0%              | 12.0%                         |
| 8000        | Light Rail Vehicle, Type 7 -- 19 EA                   | 142.0                                      | 3.6%                                         | 7,471,750.00                   | 0.0%                          | 1.5%              | 3.0%                          |
| 0           | Mitigation                                            | 141.1                                      | 3.6%                                         | 1.00                           | 0.0%                          | 0.0%              | 0.0%                          |
| 4092        | Foundation Shafts, 120" Diameter, Marine Construction | 129.6                                      | 3.3%                                         | 5,842.50                       | 0.0%                          | 8.0%              | 16.0%                         |
| 0           | Deep Soil Mixing                                      | 129.0                                      | 3.3%                                         | 225.00                         | 0.0%                          | 33.3%             | 140.0%                        |
| 0           | Temporary Structures - Maintenance of Way             | 97.7                                       | 2.5%                                         | 540.97                         | 0.0%                          | 0.0%              | 0.0%                          |
| 4327        | Pier Cap Concrete                                     | 83.9                                       | 2.1%                                         | 1,705.00                       | 0.0%                          | 10.0%             | 20.0%                         |
| 4149        | Shaft Cap Concrete                                    | 80.0                                       | 2.0%                                         | 1,705.00                       | 0.0%                          | 10.0%             | 20.0%                         |
| 4327        | Column Concrete                                       | 71.9                                       | 1.8%                                         | 1,705.00                       | 0.0%                          | 10.0%             | 20.0%                         |
| 8034        | Steel Span Removal - Marine (>200')                   | 55.1                                       | 1.4%                                         | 4,590,000.00                   | -10.0%                        | 0.0%              | 10.0%                         |
| 5767        | HMA CL. 1/2 IN. PG                                    | 51.1                                       | 1.3%                                         | 120.00                         | 0.0%                          | 4.0%              | 8.0%                          |

## Cost Estimate Validation Process (CEVP) Report

| Item Number | Description                                                             | Total Cost (millions of July 2025 dollars) | Percentage of Direct Construction Cost Total | Unit Price (July 2025 dollars) | Lower Range (10th Percentile) | Most Likely Value | Upper Range (90th Percentile) |
|-------------|-------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------|--------------------------------|-------------------------------|-------------------|-------------------------------|
| 8034        | Pier Removal - Marine                                                   | 48.9                                       | 1.2%                                         | 800,000.00                     | 0.0%                          | 5.0%              | 10.0%                         |
| 8000        | Heavy Maintenance Facility Building, Ruby Junction Main Expansion       | 46.4                                       | 1.2%                                         | 1,300.00                       | 0.0%                          | 5.0%              | 10.0%                         |
| 4269        | Prestressed Concrete Girders - WF74/74G                                 | 46.3                                       | 1.2%                                         | 725.00                         | 0.0%                          | 5.0%              | 10.0%                         |
| 7169        | Retaining Wall, MSE                                                     | 46.2                                       | 1.2%                                         | 137.00                         | 0.0%                          | 6.0%              | 12.0%                         |
| 4232        | Modified Concrete Overlay                                               | 44.2                                       | 1.1%                                         | 98.00                          | 0.0%                          | 5.0%              | 10.0%                         |
| 71          | Bridge Removal Support (Equipment, Temp Structures, Protection Systems) | 37.0                                       | 0.9%                                         | 76.67                          | 0.0%                          | 5.0%              | 10.0%                         |
| 310         | Roadway Excavation Incl. Haul                                           | 35.3                                       | 0.9%                                         | 38.00                          | 0.0%                          | 35.5%             | 71.0%                         |
| 0           | Hazardous Material Abatement, Right of Way                              | 33.3                                       | 0.9%                                         | 38.00                          | 0.0%                          | 35.5%             | 71.0%                         |
| 4084        | Foundation Shafts, 48" Diameter                                         | 29.7                                       | 0.8%                                         | 1,195.00                       | 0.0%                          | 5.0%              | 10.0%                         |
| 5095        | Crushed Surfacing Base Course                                           | 29.6                                       | 0.8%                                         | 52.00                          | 0.0%                          | 5.0%              | 10.0%                         |
| 4380        | Abutment / Wingwall Concrete                                            | 28.9                                       | 0.7%                                         | 1,705.00                       | 0.0%                          | 7.0%              | 14.0%                         |
| 4415        | 42 In Type "F" Traffic Barrier Coping with Moment Slab                  | 24.7                                       | 0.6%                                         | 643.00                         | 0.0%                          | 6.0%              | 12.0%                         |
| 4149        | Plain Reinforcing Steel in Superstructure                               | 24.2                                       | 0.6%                                         | 1.22                           | 0.0%                          | 36.4%             | 72.8%                         |
| 4149        | Reinforcing Steel in Pier Cap                                           | 18.4                                       | 0.5%                                         | 1.22                           | 0.0%                          | 36.4%             | 72.8%                         |
| 4149        | Reinforcing Steel in Column                                             | 16.4                                       | 0.4%                                         | 1.22                           | 0.0%                          | 36.4%             | 72.8%                         |

## Cost Estimate Validation Process (CEVP) Report

| Item Number | Description                                      | Total Cost (millions of July 2025 dollars) | Percentage of Direct Construction Cost Total | Unit Price (July 2025 dollars) | Lower Range (10th Percentile) | Most Likely Value | Upper Range (90th Percentile) |
|-------------|--------------------------------------------------|--------------------------------------------|----------------------------------------------|--------------------------------|-------------------------------|-------------------|-------------------------------|
| 4148        | Epoxy Coated Reinforcing Steel in Superstructure | 15.6                                       | 0.4%                                         | 1.92                           | 0.0%                          | 5.0%              | 10.0%                         |
| 4149        | Reinforcing Steel in Shaft Cap                   | 14.6                                       | 0.4%                                         | 1.22                           | 0.0%                          | 36.4%             | 72.8%                         |
| 4149        | Reinforcing Steel in Abutment                    | 3.2                                        | 0.1%                                         | 1.22                           | 0.0%                          | 36.4%             | 72.8%                         |
| 4230        | PT Reinforcement Steel                           | 1.7                                        | 0.0%                                         | 2.47                           | -10.0%                        | 0.0%              | 10.0%                         |
| 4149        | Reinforcing Steel in Pier Strut                  | 1.2                                        | 0.0%                                         | 1.22                           | 0.0%                          | 36.4%             | 72.8%                         |
| 4149        | Reinforcing Steel in Substructure                | 0.1                                        | 0.0%                                         | 1.22                           | 0.0%                          | 36.4%             | 72.8%                         |
| 0           | Other Cost Items                                 | 1195.2                                     | 30.6%                                        | -                              | -10.0%                        | 0.0%              | 10.0%                         |

Lower range, probable (most likely), and upper range values represent percentage adjustments, relative to the estimate unit price, for each cost item.

Oregon unit prices are shown.

## Cost Estimate Validation Process (CEVP) Report

Figure D-2. Base Uncertainty Ranges by Package (Unit Price and Quantity)

| Package No. | Package Name                                  | PCT           | Construction Cost Estimate | Unit Price   |             |              | Quantity |              |             |             |
|-------------|-----------------------------------------------|---------------|----------------------------|--------------|-------------|--------------|----------|--------------|-------------|-------------|
|             |                                               |               |                            | 10th         | Most Likely | 90th         | Design % | 10th         | Most Likely | 90th        |
|             | <b>Programmatic Costs (Package 0)</b>         | <b>100.0%</b> | <b>\$0</b>                 |              |             |              |          |              |             |             |
| 0           | IBR Costs To date (Actuals)                   | 34.1%         |                            |              |             |              |          |              |             |             |
| 0           | Anticipated Programmatic Costs                | 65.9%         |                            |              |             |              |          |              |             |             |
|             | <b>Packages (1-29)</b>                        | <b>100.0%</b> | <b>\$5,844,510,162</b>     |              |             |              |          |              |             |             |
| 1           | 65th Street CTRAN O&M Bus Facility            | 0.2%          | \$10,124,000               | -10.0%       | 0.0%        | 10.0%        | 1%       | -8.0%        | 0.0%        | 18.0%       |
| 2           | Bus Procurement                               | 0.2%          | \$9,823,000                | -10.0%       | 0.0%        | 10.0%        | 1%       |              |             |             |
| 3           | Bus Shelters                                  | 0.0%          | \$1,024,000                | -10.0%       | 0.0%        | 10.0%        | 5.0%     |              |             |             |
| 4           | Approaches                                    | 18.7%         | \$1,130,943,000            | -4.0%        | 8.8%        | 27.3%        | 25.0%    | -3.0%        | 0.0%        | 7.0%        |
| 5           | Columbia River Bridge                         | 25.9%         | \$1,584,642,162            | -0.4%        | 12.7%       | 30.5%        | 25.0%    | -2.0%        | 0.0%        | 5.0%        |
| 6           | Columbia River Bridge Removal                 | 3.3%          | \$207,503,000              | -6.1%        | 2.0%        | 10.1%        | 25.0%    | -5.0%        | 0.0%        | 15.0%       |
| 7           | Evergreen Park & Ride                         | 1.1%          | \$57,879,000               | -10.0%       | 0.0%        | 10.0%        | 1.0%     |              |             |             |
| 8           | Hayden Island Guideway                        | 1.8%          | \$80,878,000               | -0.4%        | 15.4%       | 33.8%        | 25.0%    | -2.0%        | 0.0%        | 5.0%        |
| 9           | Hayden Island Package A (Hayden Island)       | 0.6%          | \$18,792,000               | -4.8%        | 16.8%       | 38.3%        | 20.0%    | -5.0%        | 0.0%        | 10.0%       |
| 10          | Hayden Island Surface Streets                 | 1.3%          | \$66,556,000               | -6.1%        | 6.7%        | 19.6%        | 10.0%    | -5.0%        | 0.0%        | 12.0%       |
| 11          | Light Rail Overnight Facility                 | 1.1%          | \$63,820,000               | -9.0%        | 2.9%        | 14.8%        | 10.0%    | -5.0%        | 0.0%        | 12.0%       |
| 12          | LRV Procurement                               | 2.3%          | \$150,497,000              | 0.0%         | 1.5%        | 3.0%         | 1.0%     |              |             |             |
| 13          | Marine Drive Interchange                      | 5.2%          | \$289,771,000              | -4.3%        | 5.1%        | 14.5%        | 10.0%    | -5.0%        | 0.0%        | 12.0%       |
| 14          | Marine Drive Package A                        | 2.4%          | \$113,508,000              | -3.5%        | 6.3%        | 16.2%        | 25.0%    | -3.0%        | 0.0%        | 7.0%        |
| 15          | Mill Plain Interchange                        | 3.0%          | \$174,253,000              | -3.5%        | 6.2%        | 15.9%        | 10.0%    | -5.0%        | 0.0%        | 12.0%       |
| 16          | North Expo Road                               | 0.3%          | \$16,634,000               | -7.3%        | 1.7%        | 10.8%        | 10.0%    | -5.0%        | 0.0%        | 12.0%       |
| 17          | North Portland Harbor Bridge Removal          | 0.5%          | \$28,905,000               | -0.5%        | 5.3%        | 11.0%        | 10.0%    | -4.0%        | 0.0%        | 10.0%       |
| 18          | North Portland Harbor Transit Bridge          | 1.3%          | \$53,488,000               | -0.4%        | 16.0%       | 32.4%        | 25.0%    | -2.0%        | 0.0%        | 5.0%        |
| 19          | Oregon I-5 Northbound                         | 7.4%          | \$429,863,000              | -0.9%        | 10.3%       | 21.5%        | 10.0%    | -5.0%        | 0.0%        | 12.0%       |
| 20          | Oregon I-5 Southbound                         | 7.2%          | \$430,556,000              | -1.3%        | 10.9%       | 23.2%        | 10.0%    | -5.0%        | 0.0%        | 12.0%       |
| 21          | Oregon Station Finishes                       | 0.0%          | \$148,000                  | -10.0%       | 0.0%        | 10.0%        | 15.0%    | -5.0%        | 0.0%        | 10.0%       |
| 22          | Pre-completion tolling signage                | 0.7%          | \$36,240,000               | -5.0%        | 0.0%        | 5.0%         | 20.0%    | -5.0%        | 0.0%        | 10.0%       |
| 23          | Ruby Junction TriMet Facility Expansion       | 4.6%          | \$260,103,000              | -7.0%        | 2.5%        | 12.0%        | 15.0%    | -5.0%        | 0.0%        | 10.0%       |
| 24          | SR-14 Package A                               | 1.7%          | \$81,884,000               | -3.7%        | 6.4%        | 16.4%        | 25.0%    | -4.0%        | 0.0%        | 9.0%        |
| 25          | Track, Systems & Stations                     | 5.4%          | \$318,377,000              | -10.0%       | 0.0%        | 10.0%        | 30.0%    | -4.0%        | 0.0%        | 8.0%        |
| 26          | Washington Station Finishes                   | 0.0%          | \$155,000                  | -10.0%       | 0.0%        | 10.0%        | 15.0%    | -5.0%        | 0.0%        | 10.0%       |
| 27          | Washington North                              | 3.0%          | \$170,579,000              | -6.4%        | 5.2%        | 16.8%        | 10.0%    | -5.0%        | 0.0%        | 12.0%       |
| 28          | Waterfront Park & Ride                        | 1.0%          | \$57,565,000               | -10.0%       | 0.0%        | 10.0%        | 1.0%     |              |             |             |
| 29          | West Hayden Island Mitigation                 | 0.0%          | \$0                        | -5.0%        | 0.0%        | 5.0%         | 5.0%     |              |             |             |
|             | <b>Construction and Procurement Package T</b> | <b>100%</b>   | <b>\$5,844,510,162</b>     |              |             |              |          |              |             |             |
|             | <b>Total Program Costs (Rounded)</b>          |               | <b>\$5,844,510,162</b>     | <b>-3.2%</b> | <b>8.3%</b> | <b>22.2%</b> |          | <b>-3.4%</b> | <b>0.0%</b> | <b>8.0%</b> |

## Cost Estimate Validation Process (CEVP) Report

Figure D-3. Base Uncertainty Ranges by Package (Percentage Markups)

| Package No. | Package Name                                      | Construction Phasing/Interface |           |       |             |       | MOT      |           |       |             |        | Delivery Method Adjustment |           |      |             |       | Misc. Items Allowance |       |             |       |
|-------------|---------------------------------------------------|--------------------------------|-----------|-------|-------------|-------|----------|-----------|-------|-------------|--------|----------------------------|-----------|------|-------------|-------|-----------------------|-------|-------------|-------|
|             |                                                   | Type                           | Base Pct. | 10th  | Most Likely | 90th  | Type     | Base Pct. | 10th  | Most Likely | 90th   | Type                       | Base Pct. | 10th | Most Likely | 90th  | Base Pct.             | 10th  | Most Likely | 90th  |
|             | <b>Programmatic Costs (Package 0)</b>             |                                |           |       |             |       |          |           |       |             |        |                            |           |      |             |       |                       |       |             |       |
| 0           | IBR Costs To date (Actuals)                       |                                |           |       |             |       |          |           |       |             |        |                            |           |      |             |       |                       |       |             |       |
| 0           | Anticipated Programmatic Costs                    |                                |           |       |             |       |          |           |       |             |        |                            |           |      |             |       |                       |       |             |       |
|             | <b>Packages (1-29)</b>                            |                                |           |       |             |       |          |           |       |             |        |                            |           |      |             |       |                       |       |             |       |
| 1           | 65th Street CTRAN O&M Bus Facility                | Moderate                       | 5.0%      | 3.0%  | 5.0%        | 7.0%  | Minimal  | 0.5%      | 0.25% | 0.50%       | 1.00%  | DBB                        | 0.0%      | 0.0% | 0.0%        | 0.0%  | 12.0%                 | 8.0%  | 12.0%       | 16.0% |
| 2           | Bus Procurement                                   | NA                             | 0.0%      | 0.0%  | 0.0%        | 0.0%  | NA       | 0.0%      | 0.00% | 0.00%       | 0.00%  | 2-step Sealed Bid          | 0.0%      | 0.0% | 0.0%        | 0.0%  | 0.0%                  | 0.0%  | 0.0%        | 5.0%  |
| 3           | Bus Shelters                                      | NA                             | 0.0%      | 0.0%  | 0.0%        | 0.0%  | Low      | 1.5%      | 1.00% | 1.50%       | 2.00%  | DBB                        | 0.0%      | 0.0% | 0.0%        | 0.0%  | 10.0%                 | 6.0%  | 10.0%       | 14.0% |
| 4           | Approaches                                        | Complex                        | 13.0%     | 10.0% | 13.0%       | 16.0% | Complex  | 11.0%     | 9.00% | 11.00%      | 14.00% | PDB                        | 10.0%     | 5.0% | 10.0%       | 15.0% | 7.0%                  | 4.0%  | 7.0%        | 10.0% |
| 5           | Columbia River Bridge                             | Moderate                       | 5.0%      | 3.0%  | 5.0%        | 7.0%  | Low      | 1.5%      | 1.00% | 1.50%       | 2.00%  | PDB                        | 10.0%     | 5.0% | 10.0%       | 15.0% | 1.0%                  | 1.0%  | 1.0%        | 5.0%  |
| 6           | Columbia River Bridge Removal                     | Low                            | 2.0%      | 1.0%  | 2.0%        | 3.0%  | Moderate | 4.0%      | 2.00% | 4.00%       | 5.00%  | DBB                        | 0.0%      | 0.0% | 0.0%        | 0.0%  | 2.0%                  | 2.0%  | 2.0%        | 5.0%  |
| 7           | Evergreen Park & Ride                             | Moderate                       | 5.0%      | 3.0%  | 5.0%        | 7.0%  | Moderate | 4.0%      | 2.00% | 4.00%       | 5.00%  | DB                         | 3.0%      | 2.0% | 3.0%        | 5.0%  | 15.0%                 | 10.0% | 15.0%       | 20.0% |
| 8           | Hayden Island Guideway                            | Moderate                       | 5.0%      | 3.0%  | 5.0%        | 7.0%  | Low      | 1.5%      | 1.00% | 1.50%       | 2.00%  | CMGC                       | 7.0%      | 5.0% | 7.0%        | 12.0% | 10.0%                 | 6.0%  | 10.0%       | 14.0% |
| 9           | Hayden Island Package A (Hayden Islar             | Low                            | 2.0%      | 1.0%  | 2.0%        | 3.0%  | Moderate | 4.0%      | 2.00% | 4.00%       | 5.00%  | DBB                        | 0.0%      | 0.0% | 0.0%        | 0.0%  | 5.0%                  | 2.0%  | 5.0%        | 8.0%  |
| 10          | Hayden Island Surface Streets                     | Moderate                       | 5.0%      | 3.0%  | 5.0%        | 7.0%  | Moderate | 4.0%      | 2.00% | 4.00%       | 5.00%  | DBB                        | 0.0%      | 0.0% | 0.0%        | 0.0%  | 7.0%                  | 4.0%  | 7.0%        | 10.0% |
| 11          | Light Rail Overnight Facility                     | Minimal                        | 1.0%      | 0.5%  | 1.0%        | 1.5%  | Low      | 1.5%      | 1.00% | 1.50%       | 2.00%  | CMGC                       | 7.0%      | 5.0% | 7.0%        | 12.0% | 12.0%                 | 8.0%  | 12.0%       | 16.0% |
| 12          | LRV Procurement                                   | NA                             | 0.0%      | 0.0%  | 0.0%        | 0.0%  | NA       | 0.0%      | 0.00% | 0.00%       | 0.00%  | 2-step Sealed Bid          | 0.0%      | 0.0% | 0.0%        | 0.0%  | 0.0%                  | 0.0%  | 5.0%        | 10.0% |
| 13          | Marine Drive Interchange                          | Complex                        | 13.0%     | 10.0% | 13.0%       | 16.0% | High     | 7.0%      | 5.00% | 7.00%       | 9.00%  | CMGC                       | 7.0%      | 5.0% | 7.0%        | 12.0% | 10.0%                 | 6.0%  | 10.0%       | 14.0% |
| 14          | Marine Drive Package A                            | Complex                        | 13.0%     | 10.0% | 13.0%       | 16.0% | High     | 7.0%      | 5.00% | 7.00%       | 9.00%  | CMGC                       | 7.0%      | 5.0% | 7.0%        | 12.0% | 5.0%                  | 2.0%  | 5.0%        | 8.0%  |
| 15          | Mill Plain Interchange                            | High                           | 9.0%      | 6.0%  | 9.0%        | 11.0% | High     | 7.0%      | 5.00% | 7.00%       | 9.00%  | DB                         | 3.0%      | 2.0% | 3.0%        | 5.0%  | 10.0%                 | 6.0%  | 10.0%       | 14.0% |
| 16          | North Expo Road                                   | Moderate                       | 5.0%      | 3.0%  | 5.0%        | 7.0%  | Moderate | 4.0%      | 2.00% | 4.00%       | 5.00%  | DBB                        | 0.0%      | 0.0% | 0.0%        | 0.0%  | 7.0%                  | 4.0%  | 7.0%        | 10.0% |
| 17          | North Portland Harbor Bridge Removal              | Minimal                        | 1.0%      | 0.5%  | 1.0%        | 1.5%  | Low      | 1.5%      | 1.00% | 1.50%       | 2.00%  | DBB                        | 0.0%      | 0.0% | 0.0%        | 0.0%  | 2.0%                  | 2.0%  | 2.0%        | 5.0%  |
| 18          | North Portland Harbor Transit Bridge              | Moderate                       | 5.0%      | 3.0%  | 5.0%        | 7.0%  | Low      | 1.5%      | 1.00% | 1.50%       | 2.00%  | CMGC                       | 7.0%      | 5.0% | 7.0%        | 12.0% | 2.0%                  | 2.0%  | 2.0%        | 5.0%  |
| 19          | Oregon I-5 Northbound                             | Complex                        | 13.0%     | 10.0% | 13.0%       | 16.0% | High     | 7.0%      | 5.00% | 7.00%       | 9.00%  | CMGC                       | 7.0%      | 5.0% | 7.0%        | 12.0% | 3.0%                  | 2.0%  | 3.0%        | 5.0%  |
| 20          | Oregon I-5 Southbound                             | Complex                        | 13.0%     | 10.0% | 13.0%       | 16.0% | High     | 7.0%      | 5.00% | 7.00%       | 9.00%  | CMGC                       | 7.0%      | 5.0% | 7.0%        | 12.0% | 3.0%                  | 2.0%  | 3.0%        | 5.0%  |
| 21          | Oregon Station Finishes                           | Minimal                        | 1.0%      | 0.5%  | 1.0%        | 1.5%  | NA       | 0.0%      | 0.00% | 0.00%       | 0.00%  | DBB                        | 0.0%      | 0.0% | 0.0%        | 0.0%  | 15.0%                 | 10.0% | 15.0%       | 20.0% |
| 22          | Pre-completion tolling signage                    | Low                            | 2.0%      | 1.0%  | 2.0%        | 3.0%  | Moderate | 4.0%      | 2.00% | 4.00%       | 5.00%  | DBB                        | 0.0%      | 0.0% | 0.0%        | 0.0%  | 10.0%                 | 6.0%  | 10.0%       | 14.0% |
| 23          | Ruby Junction TriMet Facility Expansion           | Minimal                        | 1.0%      | 0.5%  | 1.0%        | 1.5%  | Moderate | 4.0%      | 2.00% | 4.00%       | 5.00%  | CMGC                       | 7.0%      | 5.0% | 7.0%        | 12.0% | 12.0%                 | 8.0%  | 12.0%       | 16.0% |
| 24          | SR-14 Package A                                   | High                           | 9.0%      | 6.0%  | 9.0%        | 11.0% | Complex  | 11.0%     | 9.00% | 11.00%      | 14.00% | DBB                        | 0.0%      | 0.0% | 0.0%        | 0.0%  | 3.0%                  | 2.0%  | 3.0%        | 5.0%  |
| 25          | Track, Systems & Stations                         | High                           | 9.0%      | 6.0%  | 9.0%        | 11.0% | Moderate | 4.0%      | 2.00% | 4.00%       | 5.00%  | CMGC                       | 7.0%      | 5.0% | 7.0%        | 12.0% | 15.0%                 | 10.0% | 15.0%       | 20.0% |
| 26          | Washington Station Finishes                       | Minimal                        | 1.0%      | 0.5%  | 1.0%        | 1.5%  | NA       | 0.0%      | 0.00% | 0.00%       | 0.00%  | DBB                        | 0.0%      | 0.0% | 0.0%        | 0.0%  | 15.0%                 | 10.0% | 15.0%       | 20.0% |
| 27          | Washington North                                  | Complex                        | 13.0%     | 10.0% | 13.0%       | 16.0% | High     | 7.0%      | 5.00% | 7.00%       | 9.00%  | DB                         | 3.0%      | 2.0% | 3.0%        | 5.0%  | 10.0%                 | 6.0%  | 10.0%       | 14.0% |
| 28          | Waterfront Park & Ride                            | Low                            | 2.0%      | 1.0%  | 2.0%        | 3.0%  | Low      | 1.5%      | 1.00% | 1.50%       | 2.00%  | DB                         | 3.0%      | 2.0% | 3.0%        | 5.0%  | 12.0%                 | 8.0%  | 12.0%       | 16.0% |
| 29          | West Hayden Island Mitigation                     | Minimal                        | 1.0%      | 0.5%  | 1.0%        | 1.5%  | Minimal  | 0.5%      | 0.25% | 0.50%       | 1.00%  | DBB                        | 0.0%      | 0.0% | 0.0%        | 0.0%  | 7.0%                  | 4.0%  | 7.0%        | 10.0% |
|             | <b>Construction and Procurement Package Total</b> |                                |           |       |             |       |          |           |       |             |        |                            |           |      |             |       |                       |       |             |       |
|             | <b>Total Program Costs (Rounded)</b>              |                                |           | 6.0%  | 8.4%        | 10.6% |          |           | 3.9%  | 5.4%        | 6.9%   |                            |           | 4.2% | 7.3%        | 11.6% |                       | 3.5%  | 5.6%        | 9.1%  |

## Cost Estimate Validation Process (CEVP) Report

Figure D-4. Base Uncertainty Ranges by Package (PE and Right of Way)

| Package No. | Package Name                                      | Preliminary Engineering |              |             |              | Right-of-Way         |               |             |              |
|-------------|---------------------------------------------------|-------------------------|--------------|-------------|--------------|----------------------|---------------|-------------|--------------|
|             |                                                   | Estimate                | 10th         | Most Likely | 90th         | Estimate             | 10th          | Most Likely | 90th         |
|             | <b>Programmatic Costs (Package 0)</b>             | <b>\$692,881,728</b>    |              |             |              | <b>\$0</b>           |               |             |              |
| 0           | IBR Costs To date (Actuals)                       | \$236,591,728           | 0.0%         |             | 0.0%         |                      |               |             |              |
| 0           | Anticipated Programmatic Costs                    | \$456,290,000           | -5.0%        | 0.0%        | 15.0%        |                      |               |             |              |
|             | <b>Packages (1-29)</b>                            | <b>\$965,702,000</b>    |              |             |              | <b>\$307,153,000</b> |               |             |              |
| 1           | 65th Street CTRAN O&M Bus Facility                | \$2,466,000             | -5.0%        | 0.0%        | 12.5%        | \$0                  | -20.0%        | 0.0%        | 20.0%        |
| 2           | Bus Procurement                                   | \$874,000               | -5.0%        | 0.0%        | 12.5%        | \$0                  | -20.0%        | 0.0%        | 20.0%        |
| 3           | Bus Shelters                                      | \$361,000               | -5.0%        | 0.0%        | 12.5%        | \$0                  | -20.0%        | 0.0%        | 20.0%        |
| 4           | Approaches                                        | \$148,050,000           | -5.0%        | 0.0%        | 12.5%        | \$50,447,000         | -10.0%        | 0.0%        | 10.0%        |
| 5           | Columbia River Bridge                             | \$222,268,000           | -5.0%        | 0.0%        | 12.5%        | \$36,999,000         | -10.0%        | 0.0%        | 10.0%        |
| 6           | Columbia River Bridge Removal                     | \$24,715,000            | -5.0%        | 0.0%        | 12.5%        | \$1,374,000          | -10.0%        | 0.0%        | 10.0%        |
| 7           | Evergreen Park & Ride                             | \$12,639,000            | -5.0%        | 0.0%        | 12.5%        | \$7,940,000          | -20.0%        | 0.0%        | 20.0%        |
| 8           | Hayden Island Guideway                            | \$16,320,000            | -5.0%        | 0.0%        | 12.5%        | \$34,192,000         | -10.0%        | 0.0%        | 10.0%        |
| 9           | Hayden Island Package A (Hayden Island)           | \$2,543,000             | -5.0%        | 0.0%        | 12.5%        | \$19,644,000         | -10.0%        | 0.0%        | 10.0%        |
| 10          | Hayden Island Surface Streets                     | \$15,864,000            | -5.0%        | 0.0%        | 12.5%        | \$7,142,000          | -15.0%        | 0.0%        | 15.0%        |
| 11          | Light Rail Overnight Facility                     | \$12,460,000            | -5.0%        | 0.0%        | 12.5%        | \$0                  | -15.0%        | 0.0%        | 15.0%        |
| 12          | LRV Procurement                                   | \$9,805,000             | -5.0%        | 0.0%        | 12.5%        | \$0                  | -20.0%        | 0.0%        | 20.0%        |
| 13          | Marine Drive Interchange                          | \$71,332,000            | -5.0%        | 0.0%        | 12.5%        | \$10,976,000         | -15.0%        | 0.0%        | 15.0%        |
| 14          | Marine Drive Package A                            | \$25,255,000            | -5.0%        | 0.0%        | 12.5%        | \$33,803,000         | -10.0%        | 0.0%        | 10.0%        |
| 15          | Mill Plain Interchange                            | \$36,404,000            | -5.0%        | 0.0%        | 12.5%        | \$2,037,000          | -15.0%        | 0.0%        | 15.0%        |
| 16          | North Expo Road                                   | \$3,391,000             | -5.0%        | 0.0%        | 12.5%        | \$135,000            | -15.0%        | 0.0%        | 15.0%        |
| 17          | North Portland Harbor Bridge Removal              | \$6,349,000             | -5.0%        | 0.0%        | 12.5%        | \$0                  | -15.0%        | 0.0%        | 15.0%        |
| 18          | North Portland Harbor Transit Bridge              | \$10,410,000            | -5.0%        | 0.0%        | 12.5%        | \$28,251,000         | -10.0%        | 0.0%        | 10.0%        |
| 19          | Oregon I-5 Northbound                             | \$82,103,000            | -5.0%        | 0.0%        | 12.5%        | \$16,209,000         | -15.0%        | 0.0%        | 15.0%        |
| 20          | Oregon I-5 Southbound                             | \$81,960,000            | -5.0%        | 0.0%        | 12.5%        | \$0                  | -15.0%        | 0.0%        | 15.0%        |
| 21          | Oregon Station Finishes                           | \$72,000                | -5.0%        | 0.0%        | 12.5%        | \$0                  | -12.5%        | 0.0%        | 12.5%        |
| 22          | Pre-completion tolling signage                    | \$10,138,000            | -5.0%        | 0.0%        | 12.5%        | \$0                  | -10.0%        | 0.0%        | 10.0%        |
| 23          | Ruby Junction TriMet Facility Expansion           | \$51,329,000            | -5.0%        | 0.0%        | 12.5%        | \$15,448,000         | -12.5%        | 0.0%        | 12.5%        |
| 24          | SR-14 Package A                                   | \$12,905,000            | -5.0%        | 0.0%        | 12.5%        | \$23,311,000         | -10.0%        | 0.0%        | 10.0%        |
| 25          | Track, Systems & Stations                         | \$64,862,000            | -5.0%        | 0.0%        | 12.5%        | \$0                  | -10.0%        | 0.0%        | 10.0%        |
| 26          | Washington Station Finishes                       | \$50,000                | -5.0%        | 0.0%        | 12.5%        | \$0                  | -12.5%        | 0.0%        | 12.5%        |
| 27          | Washington North                                  | \$31,085,000            | -5.0%        | 0.0%        | 12.5%        | \$14,499,000         | -15.0%        | 0.0%        | 15.0%        |
| 28          | Waterfront Park & Ride                            | \$9,692,000             | -5.0%        | 0.0%        | 12.5%        | \$2,383,000          | -20.0%        | 0.0%        | 20.0%        |
| 29          | West Hayden Island Mitigation                     | \$0                     | -5.0%        | 0.0%        | 12.5%        | \$2,363,000          | -20.0%        | 0.0%        | 20.0%        |
|             | <b>Construction and Procurement Package Total</b> | <b>\$965,702,000</b>    |              |             |              | <b>\$307,153,000</b> |               |             |              |
|             | <b>Total Program Costs (Rounded)</b>              | <b>\$1,658,583,728</b>  | <b>-5.0%</b> | <b>0.0%</b> | <b>12.5%</b> | <b>\$307,153,000</b> | <b>-11.4%</b> | <b>0.0%</b> | <b>11.4%</b> |

## Cost Estimate Validation Process (CEVP) Report

Figure D-5. Correlation Matrices

### Base Cost Uncertainty

|                                            |      |
|--------------------------------------------|------|
| Correlation among construction categories: | 0    |
| Correlation among categories:              | 0.25 |
| Correlation among packages:                | 1    |

|                                 | Unit Price | Quantity | Construction Complexity | MOT  | Delivery Method | Miscellaneous Items Allowance | Preliminary Engineering | Right-of-Way |
|---------------------------------|------------|----------|-------------------------|------|-----------------|-------------------------------|-------------------------|--------------|
| 1 Unit Price                    | 1          |          |                         |      |                 |                               |                         |              |
| 2 Quantity                      | 0          | 1        |                         |      |                 |                               |                         |              |
| 3 Construction Complexity       | 0          | 0        | 1                       |      |                 |                               |                         |              |
| 4 MOT                           | 0          | 0        | 0                       | 1    |                 |                               |                         |              |
| 5 Delivery Method               | 0          | 0        | 0                       | 0    | 1               |                               |                         |              |
| 6 Miscellaneous Items Allowance | 0          | 0        | 0                       | 0    | 0               | 1                             |                         |              |
| 7 Preliminary Engineering       | 0.25       | 0.25     | 0.25                    | 0.25 | 0.25            | 0.25                          | 1                       |              |
| 8 Right-of-Way                  | 0.25       | 0.25     | 0.25                    | 0.25 | 0.25            | 0.25                          | 0.25                    | 1            |

### Base Uncertainty - Inflation

|                | PE  | ROW | Construction |
|----------------|-----|-----|--------------|
| 1 PE           | 1   |     |              |
| 2 ROW          | 0.5 | 1   |              |
| 3 Construction | 0.5 | 0.5 | 1            |

Note: Values represent the assumed correlations (i.e., indirect relationships due to common underlying factors such as labor, equipment and material prices, estimator tendency) between line items in the base estimates. A value of 1 indicates a perfect positive relationship, and a value of 0 indicates no relationship (independence). Additional correlations are captured through the structure of the integrated cost/schedule model and specific risk events (including market conditions factors) which may be correlated across activities or packages.

Table D-2. Base Cost-Loaded Schedule Summary

| Activity ID | Activity Name                                                    | Base Start Date | Base Completion Date | Base Cost (July 2025, millions of dollars) | Base Cost (millions of YOY dollars) |
|-------------|------------------------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| 0           | Prior/Fixed Costs: Program                                       | 7/1/2025        | 7/1/2025             | 238.2                                      | 238.2                               |
| PRG-1a      | Program Management Pre-ROD (F-F with ROD, ENV-5)                 | 7/1/2025        | 4/8/2026             | 25.8                                       | 26.1                                |
| PRG-1b      | Program Management Post-ROD (F-F with program completion, PRG-3) | 4/8/2026        | 6/20/2045            | 430.5                                      | 597.7                               |
| PRG-2       | Bridges, Approaches, and Transit Complete                        | 5/25/2036       | 5/25/2036            | 0.0                                        | 0.0                                 |
| PRG-3       | IBR Program Complete                                             | 6/20/2045       | 6/20/2045            | 0.0                                        | 0.0                                 |
| DES-1a      | Plan Set for FEIS                                                | 7/1/2025        | 9/9/2025             | 0.0                                        | 0.0                                 |
| DES-1a'     | Plan Set for FEIS                                                | 9/9/2025        | 9/9/2025             | 0.0                                        | 0.0                                 |
| DES-1a''    | Plan Set for FEIS                                                | 9/9/2025        | 9/9/2025             | 0.0                                        | 0.0                                 |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                                   | Base Start Date | Base Completion Date | Base Cost (July 2025, millions of dollars) | Base Cost (millions of YOY dollars) |
|-------------|-----------------------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| DES-1b      | 30% Design                                                      | 9/9/2025        | 12/2/2025            | 0.0                                        | 0.0                                 |
| DES-2       | 30% Design for Transit                                          | 9/9/2025        | 12/2/2025            | 0.0                                        | 0.0                                 |
| DES-2'      | 30% Design for Transit                                          | 12/2/2025       | 12/2/2025            | 0.0                                        | 0.0                                 |
| DES-3       | 60% Design for Transit                                          | 4/28/2026       | 7/27/2027            | 0.0                                        | 0.0                                 |
| DES-4       | 100% Design for Transit                                         | 7/27/2027       | 4/30/2028            | 0.0                                        | 0.0                                 |
| ENV-1       | Publish Draft SEIS                                              | 7/1/2025        | 7/1/2025             | 0.0                                        | 0.0                                 |
| ENV-2       | ESA Section 7 / BO                                              | 7/1/2025        | 7/1/2025             | 0.0                                        | 0.0                                 |
| ENV-3       | Section 106 Programmatic Agreement & Mitigation Plan            | 7/1/2025        | 10/30/2025           | 0.0                                        | 0.0                                 |
| ENV-4a      | Finalize FEIS                                                   | 7/1/2025        | 3/12/2026            | 0.0                                        | 0.0                                 |
| ENV-4b      | Issue ROD                                                       | 3/12/2026       | 4/8/2026             | 0.0                                        | 0.0                                 |
| ENV-5       | Publish ROD                                                     | 4/8/2026        | 4/8/2026             | 0.0                                        | 0.0                                 |
| ENV-5'      | Publish ROD                                                     | 4/8/2026        | 4/8/2026             | 0.0                                        | 0.0                                 |
| ENV-5''     | Publish ROD                                                     | 4/8/2026        | 4/8/2026             | 0.0                                        | 0.0                                 |
| ENV-5a      | Post-ROD                                                        | 4/8/2026        | 4/8/2026             | 0.0                                        | 0.0                                 |
| ENV-7       | USACE 401/404/408 Permits                                       | 7/1/2025        | 9/1/2026             | 0.0                                        | 0.0                                 |
| ENV-9       | Cultural Resources Agrmt/Survey: CRB                            | 10/30/2025      | 10/9/2026            | 0.0                                        | 0.0                                 |
| ENV-10      | Cultural Resources Agrmt/Survey: Vancouver Approaches           | 12/2/2025       | 12/8/2027            | 0.0                                        | 0.0                                 |
| ENV-11      | Cultural Resources Agrmt/Survey: Hayden Island                  | 12/2/2025       | 12/5/2027            | 0.0                                        | 0.0                                 |
| EXT-1       | USCG PNCD                                                       | 7/1/2025        | 11/10/2025           | 0.0                                        | 0.0                                 |
| ROW-1       | Limited Access Waiver (WA) / Finalize Right of Way Plans        | 7/1/2025        | 2/12/2026            | 0.0                                        | 0.0                                 |
| AGR-1       | Bi-State (OR/WA) Intergovernmental Agreement (incl. governance) | 7/1/2025        | 3/2/2026             | 0.0                                        | 0.0                                 |
| AGR-2       | TriMet Delivery Agreement Decision                              | 7/1/2025        | 10/31/2025           | 0.0                                        | 0.0                                 |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                    | Base Start Date | Base Completion Date | Base Cost (July 2025, millions of dollars) | Base Cost (millions of YOY dollars) |
|-------------|--------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| AGR-3       | Critical Transit Agreements for FFGA             | 7/1/2025        | 8/4/2026             | 0.0                                        | 0.0                                 |
| AGR-4       | WSDOT/TriMet Design/Construction IGA             | 7/1/2025        | 4/28/2026            | 0.0                                        | 0.0                                 |
| FIN-1       | CRB State/Federal Funding (incl. BIP)            | 7/1/2025        | 4/8/2026             | 0.0                                        | 0.0                                 |
| FIN-2       | CRB Funding Secured                              | 4/8/2026        | 4/8/2026             | 0.0                                        | 0.0                                 |
| FIN-3       | Start Pre-Completion Tolling                     | 4/19/2027       | 4/19/2027            | 0.0                                        | 0.0                                 |
| FIN-3'      | Start Pre-Completion Tolling                     | 4/19/2027       | 4/19/2027            | 0.0                                        | 0.0                                 |
| CIG-1       | FTA CIG Process to 30%                           | 7/1/2025        | 1/4/2027             | 0.0                                        | 0.0                                 |
| CIG-2       | FTA Approval for Entry into Engineering          | 1/4/2027        | 1/4/2027             | 0.0                                        | 0.0                                 |
| CIG-2'      | FTA Approval for Entry into Engineering          | 1/4/2027        | 1/4/2027             | 0.0                                        | 0.0                                 |
| CIG-3       | FTA Readiness Reviews for FFGA                   | 1/4/2027        | 9/3/2028             | 0.0                                        | 0.0                                 |
| CIG-4       | FTA FFGA                                         | 9/3/2028        | 9/3/2028             | 0.0                                        | 0.0                                 |
| CIG-5       | FTA Prepare LONP for Bridge Construction         | 4/8/2026        | 1/4/2027             | 0.0                                        | 0.0                                 |
| CIG-6       | Issue LONP                                       | 1/4/2027        | 1/4/2027             | 0.0                                        | 0.0                                 |
| CRB-1a      | Columbia River Bridge Preliminary Design/RFQ     | 9/9/2025        | 1/26/2026            | 31.9                                       | 32.3                                |
| CRB-1b      | Columbia River Bridge RFQ Response / Develop RFP | 1/26/2026       | 5/18/2026            | 25.7                                       | 26.4                                |
| CRB-2       | USCG Bridge Permit                               | 11/10/2025      | 12/9/2026            | 0.0                                        | 0.0                                 |
| CRB-3       | Third-Party Agreements: CRB                      | 7/1/2025        | 8/3/2026             | 0.0                                        | 0.0                                 |
| CRB-4       | Columbia River Bridge (CRB) RFP                  | 5/18/2026       | 5/18/2026            | 0.0                                        | 0.0                                 |
| CRB-5       | CRB Proposals/Selection (PDB)                    | 5/18/2026       | 1/1/2027             | 52.3                                       | 54.6                                |
| CRB-6a      | CRB Critical Right of Way                        | 7/1/2025        | 12/31/2027           | 26.9                                       | 27.5                                |
| CRB-6b      | CRB Remaining Right of Way                       | 12/31/2027      | 12/9/2028            | 10.1                                       | 11.2                                |
| CRB-7       | Issue CRB NTP #1                                 | 1/1/2027        | 1/1/2027             | 0.0                                        | 0.0                                 |
| CRB-8a      | CRB 30%-60% Design                               | 1/1/2027        | 1/1/2028             | 83.7                                       | 89.8                                |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                               | Base Start Date | Base Completion Date | Base Cost (July 2025, millions of dollars) | Base Cost (millions of YOE dollars) |
|-------------|-------------------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| CRB-8b      | Design / Negotiations for Early Work Packages               | 1/1/2027        | 1/1/2028             | 0.0                                        | 0.0                                 |
| CRB-9       | GMP Negotiations                                            | 1/1/2028        | 5/5/2028             | 28.7                                       | 31.4                                |
| CRB-10      | Prep for Early Works                                        | 1/1/2028        | 3/13/2028            | 0.0                                        | 0.0                                 |
| CRB-11      | CRB NTP #2                                                  | 5/5/2028        | 5/5/2028             | 0.0                                        | 0.0                                 |
| CRB-12      | Procure/Mob Foundations/Ground Improvement/Final Design     | 5/5/2028        | 2/2/2029             | 243.4                                      | 272.9                               |
| CRB-13      | In-Water Early Works (Install Trestle/ Shaft Reaction Pile) | 3/13/2028       | 12/12/2028           | 0.0                                        | 0.0                                 |
| CRB-14      | Columbia River Bridge In-Water Work                         | 2/2/2029        | 12/29/2030           | 0.0                                        | 0.0                                 |
| CRB-15      | Columbia River Bridge Construction - Set Girders/Deck NB/SB | 2/2/2029        | 7/11/2032            | 1,119.0                                    | 1,342.6                             |
| CRB-16      | Complete CRB NB                                             | 7/1/2025        | 7/1/2025             | 0.0                                        | 0.0                                 |
| CRB-17      | CRB Closeout                                                | 7/11/2032       | 10/10/2032           | 81.1                                       | 103.2                               |
| CBA-1       | CRB (Vancouver) Approaches Design/Agreements                | 9/9/2025        | 1/11/2027            | 40.3                                       | 41.6                                |
| CBA-2       | CRB (Vancouver) Approaches RFQ                              | 1/11/2027       | 1/11/2027            | 0.0                                        | 0.0                                 |
| CBA-3a      | Approaches Proposals/Selection (PDB)                        | 1/11/2027       | 2/7/2028             | 32.3                                       | 34.7                                |
| CBA-3b      | Approaches NTP #1                                           | 2/7/2028        | 2/7/2028             | 0.0                                        | 0.0                                 |
| CBA-3c      | Approaches 30%-60% Design / Permitting                      | 2/7/2028        | 6/11/2029            | 40.4                                       | 45.2                                |
| CBA-3d      | Approaches Final Design                                     | 6/11/2029       | 3/30/2030            | 24.1                                       | 27.9                                |
| CBA-3e      | BNSF Agreements (C&M, ROE)                                  | 3/30/2030       | 8/9/2030             | 10.9                                       | 12.9                                |
| CBA-3f      | Approaches GMP Negotiations                                 | 3/30/2030       | 3/30/2030            | 0.0                                        | 0.0                                 |
| CBA-4       | CRB (Vancouver) Approaches Right of Way (incl. BNSF)        | 4/8/2026        | 9/6/2030             | 50.4                                       | 55.8                                |
| CBA-5       | CRB Approaches NTP for CN                                   | 10/10/2030      | 10/10/2030           | 0.0                                        | 0.0                                 |
| CBA-6       | CRB Approaches Stage 1 Vancouver SB                         | 10/10/2030      | 10/11/2032           | 411.3                                      | 509.4                               |

## Cost Estimate Validation Process (CEVP) Report

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|-------------|-----------------------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| CBA-6'      | CRB Approaches Stage 1 Vancouver SB Lag                         | 6/3/2032        | 6/3/2032             | 0.0                                        | 0.0                                 |
| CBA-7       | CBRA Traffic Shift #1                                           | 10/11/2032      | 10/11/2032           | 0.0                                        | 0.0                                 |
| CBA-7'      | CBRA Traffic Shift #1                                           | 10/11/2032      | 10/11/2032           | 0.0                                        | 0.0                                 |
| CBA-8       | CRBA Vancouver Stages 2/3                                       | 10/11/2032      | 1/23/2036            | 673.6                                      | 907.3                               |
| CBA-8.1     | CRBA Vancouver Stage 2 Lag (ties to Waterfront P&R)             | 7/7/2033        | 7/7/2033             | 0.0                                        | 0.0                                 |
| CBA-8.1'    | CRBA Vancouver Stage 2 Lag (ties to Waterfront P&R)             | 7/7/2033        | 7/7/2033             | 0.0                                        | 0.0                                 |
| CBA-9       | Hayden Island Stages 1-3 (incl. Traffic Switch 4)               | 10/11/2032      | 2/23/2034            | 0.0                                        | 0.0                                 |
| CBA-10      | Hayden Island Stage 4                                           | 2/23/2034       | 5/24/2034            | 0.0                                        | 0.0                                 |
| CBA-10'     | Hayden Island Stage 4                                           | 5/24/2034       | 5/24/2034            | 0.0                                        | 0.0                                 |
| CBA-11      | Vancouver Approaches Closeout                                   | 1/23/2036       | 4/14/2036            | 46.1                                       | 65.6                                |
| CBA-11'     | Vancouver Approaches Closeout                                   | 4/14/2036       | 4/14/2036            | 0.0                                        | 0.0                                 |
| CBA-12a     | Prep for CRB Partial Demo                                       | 7/1/2025        | 7/1/2025             | 0.0                                        | 0.0                                 |
| CBA-12b     | CRB Partial Demo                                                | 7/1/2025        | 7/1/2025             | 0.0                                        | 0.0                                 |
| SRA-1       | SR 14 Package A Design to 100%/Permits/Agreements               | 9/9/2025        | 5/1/2028             | 10.1                                       | 10.6                                |
| SRA-2       | SR 14 Package A Advance Utilities                               | 5/1/2028        | 9/29/2028            | 1.6                                        | 1.7                                 |
| SRA-3       | SR 14 Right of Way (incl. BNSF)                                 | 4/8/2026        | 7/12/2028            | 23.3                                       | 24.5                                |
| SRA-4       | SR 14 Package A Ad                                              | 7/12/2028       | 7/12/2028            | 0.0                                        | 0.0                                 |
| SRA-5       | SR 14 Bid (DBB)                                                 | 7/12/2028       | 11/9/2028            | 1.3                                        | 1.4                                 |
| SRA-6       | SR 14 Package A NTP                                             | 11/9/2028       | 11/9/2028            | 0.0                                        | 0.0                                 |
| SRA-7       | SR 14 Package A Construction                                    | 11/9/2028       | 10/10/2030           | 72.0                                       | 83.6                                |
| SRA-8       | SR 14 Package A Closeout                                        | 10/10/2030      | 1/14/2031            | 9.9                                        | 11.9                                |
| SRA-9       | Evergreen Bridge Construction                                   | 11/9/2028       | 9/13/2029            | 0.0                                        | 0.0                                 |
| HIA-0       | Hayden Island Package A Design to 100%/Permits/Agrmts/Utilities | 9/9/2025        | 4/18/2028            | 2.2                                        | 2.4                                 |
| HIA-1       | Hayden Island Package A Ad                                      | 3/6/2029        | 3/6/2029             | 0.0                                        | 0.0                                 |

## Cost Estimate Validation Process (CEVP) Report

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|-------------|----------------------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| HIA-2       | Hayden Island Package A Bid/Award (DBB)                        | 3/6/2029        | 7/8/2029             | 0.3                                        | 0.3                                 |
| HIA-3       | Hayden Island Right of Way                                     | 4/8/2026        | 12/7/2028            | 19.6                                       | 20.9                                |
| HIA-4       | Hayden Island Package A NTP                                    | 7/8/2029        | 7/8/2029             | 0.0                                        | 0.0                                 |
| HIA-5       | Hayden Island Package A Construction                           | 7/8/2029        | 7/8/2030             | 18.8                                       | 22.0                                |
| HIA-5'      | Hayden Island Package A Construction Complete                  | 7/8/2030        | 7/8/2030             | 0.0                                        | 0.0                                 |
| -           | -                                                              | -               | -                    | -                                          | -                                   |
| HIG-1       | Hayden Island Guideway RFQ Prep/CPARB                          | 12/2/2025       | 5/3/2026             | 1.9                                        | 1.9                                 |
| HIG-2       | Hayden Island Guideway Transit RFQ                             | 9/27/2026       | 9/27/2026            | 0.0                                        | 0.0                                 |
| HIG-3       | Hayden Island Guideway Transit Selection/Final Design          | 9/27/2026       | 11/30/2029           | 14.4                                       | 15.9                                |
| HIG-4       | Hayden Island Guideway Transit Right of Way                    | 4/8/2026        | 12/10/2028           | 34.2                                       | 36.3                                |
| HIG-5       | Hayden Island Guideway Transit GMP/Award                       | 11/30/2029      | 11/30/2029           | 0.0                                        | 0.0                                 |
| HIG-6       | Hayden Island Guideway Transit Construction                    | 7/8/2030        | 7/10/2032            | 80.9                                       | 99.4                                |
| HIG-6'      | Hayden Island Guideway Transit Construction Complete           | 7/10/2032       | 7/10/2032            | 0.0                                        | 0.0                                 |
| -           | -                                                              | -               | -                    | -                                          | -                                   |
| CBR-1       | CRB Bridge Removal Design/Permits/Utilities/Cultural Resources | 9/9/2025        | 3/20/2029            | 22.5                                       | 24.1                                |
| CBR-2       | CRB Bridge Removal Right of Way                                | 1/3/2027        | 7/11/2029            | 1.4                                        | 1.5                                 |
| CBR-3       | CRB Bridge Removal Ad                                          | 7/11/2029       | 7/11/2029            | 0.0                                        | 0.0                                 |
| CBR-4       | CRB Bridge Removal Bid/Award (DBB)                             | 7/11/2029       | 11/14/2029           | 2.2                                        | 2.5                                 |
| CBR-5       | CRB Bridge Removal NTP                                         | 2/23/2034       | 2/23/2034            | 0.0                                        | 0.0                                 |
| CBR-6       | Interstate Bridge Removal Construction                         | 2/23/2034       | 5/25/2036            | 207.5                                      | 286.9                               |
| CBR-7       | Interstate Bridge Removal Construction - In-Water work         | 9/19/2034       | 4/4/2036             | 0.0                                        | 0.0                                 |

## Cost Estimate Validation Process (CEVP) Report

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|-------------|--------------------------------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| CBR-8       | Interstate Bridge Removal Construction Complete                          | 5/25/2036       | 5/25/2036            | 0.0                                        | 0.0                                 |
| -           | -                                                                        | -               | -                    | -                                          | -                                   |
| LRT-0       | Program-Wide Transit RFP Prep/CPARB                                      | 12/2/2025       | 5/2/2026             | 8.6                                        | 8.8                                 |
| LRT-1       | Program-Wide Transit RFQ                                                 | 7/8/2026        | 7/8/2026             | 0.0                                        | 0.0                                 |
| LRT-2       | Program-Wide Transit Selection/ Permits/ Utilities/ Negotiations (CM/GC) | 7/8/2026        | 3/24/2029            | 56.3                                       | 61.0                                |
| LRT-3       | Program-Wide Transit GMP/Award (GC/CM)                                   | 1/5/2029        | 1/5/2029             | 0.0                                        | 0.0                                 |
| LRT-4a      | Right of Way for Transit (Track/Systems/Stations): Oregon                | 4/8/2026        | 6/9/2028             | 0.0                                        | 0.0                                 |
| LRT-4b      | Right of Way for Transit (Track/Systems/Stations): Washington            | 4/8/2026        | 6/9/2028             | 0.0                                        | 0.0                                 |
| -           | -                                                                        | -               | -                    | -                                          | -                                   |
| LRT-6       | Plinths and Track Construction                                           | 6/16/2032       | 6/15/2033            | 53.0                                       | 68.1                                |
| LRT-7       | Waterfront Station Construction                                          | 6/3/2032        | 10/2/2033            | 24.9                                       | 32.2                                |
| LRT-8       | Evergreen Station Construction                                           | 10/11/2032      | 12/10/2033           | 24.9                                       | 32.4                                |
| LRT-8'      | Evergreen Station Construction                                           | 12/10/2033      | 12/10/2033           | 0.0                                        | 0.0                                 |
| LRT-9       | Expo Station Construction                                                | 12/25/2031      | 10/24/2032           | 27.3                                       | 34.4                                |
| LRT-10      | Hayden Island Station Construction                                       | 7/10/2032       | 7/10/2033            | 27.3                                       | 35.1                                |
| LRT-11      | Systems Construction                                                     | 12/13/2032      | 6/16/2034            | 80.1                                       | 105.3                               |
| LRT-12      | Testing & Commissioning                                                  | 6/16/2034       | 9/16/2035            | 66.5                                       | 91.3                                |
| LRT-13      | Operator Training / Route Simulation                                     | 6/16/2035       | 1/1/2036             | 14.5                                       | 20.3                                |
| LRT-14      | Transit Revenue Service Date                                             | 1/1/2036        | 1/1/2036             | 0.0                                        | 0.0                                 |
| -           | -                                                                        | -               | -                    | -                                          | -                                   |
| MDA-0       | Marine Drive Package A RFQ Prep/CPARB                                    | 12/2/2025       | 5/3/2026             | 2.7                                        | 2.8                                 |
| MDA-1       | Marine Drive Package A RFQ                                               | 7/10/2026       | 7/10/2026            | 0.0                                        | 0.0                                 |
| MDA-2       | Marine Drive Package A Selection/Design (CM/GC)                          | 7/10/2026       | 12/22/2029           | 22.5                                       | 24.7                                |

## Cost Estimate Validation Process (CEVP) Report

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|-------------|--------------------------------------------------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| MDA-3       | Marine Drive Package A Right of Way                                                        | 4/8/2026        | 6/16/2029            | 33.8                                       | 36.3                                |
| MDA-4       | Marine Drive Package A GMP/Award                                                           | 12/22/2029      | 12/22/2029           | 0.0                                        | 0.0                                 |
| MDA-5       | Marine Drive Package A Construction                                                        | 12/22/2029      | 12/25/2031           | 113.5                                      | 136.9                               |
| -           | -                                                                                          | -               | -                    | -                                          | -                                   |
| LRF-0       | LRF Overnight Facility RFQ Prep/CPARB                                                      | 12/2/2025       | 5/3/2026             | 2.0                                        | 2.0                                 |
| LRF-1       | LRT Overnight Facility RFQ                                                                 | 5/3/2026        | 5/3/2026             | 0.0                                        | 0.0                                 |
| LRF-2       | LRT Overnight Facility Selection/Design (CM/GC)                                            | 5/3/2026        | 7/29/2028            | 10.5                                       | 11.2                                |
| LRF-3       | LRT Overnight Facility GMP/Award                                                           | 9/3/2028        | 9/3/2028             | 0.0                                        | 0.0                                 |
| LRF-4       | LRT Overnight Facility Construction                                                        | 4/22/2030       | 10/24/2031           | 47.8                                       | 57.8                                |
| LRF-5       | LRT Overnight Facility TriMet Move                                                         | 10/24/2031      | 2/2/2033             | 16.1                                       | 20.3                                |
| LRF-6       | LRT Overnight Facility Right of Way                                                        | 7/1/2025        | 7/1/2025             | 0.0                                        | 0.0                                 |
| -           | -                                                                                          | -               | -                    | -                                          | -                                   |
| PHT-1       | North Portland Harbor Transit RFQ Prep/CPARB                                               | 12/2/2025       | 5/2/2026             | 1.1                                        | 1.1                                 |
| PHT-2       | North Portland Harbor Transit RFQ                                                          | 5/2/2026        | 5/2/2026             | 0.0                                        | 0.0                                 |
| PHT-3       | North Portland Harbor Transit Right of Way                                                 | 4/8/2026        | 8/13/2029            | 28.3                                       | 30.5                                |
| PHT-4a      | USACE / USCG Permits for NPH Transit / Marine Drive                                        | 4/8/2026        | 6/22/2029            | 0.0                                        | 0.0                                 |
| PHT-4b      | North Portland Harbor Transit Permit (USACE)                                               | 3/6/2029        | 3/6/2029             | 0.0                                        | 0.0                                 |
| PHT-4b'     | North Portland Harbor Transit Permit (USACE)                                               | 3/6/2029        | 3/6/2029             | 0.0                                        | 0.0                                 |
| PHT-5       | North Portland Harbor Transit Selection/ Design/ Permitting/ Utilities, Cultural Resources | 5/2/2026        | 12/15/2029           | 9.3                                        | 10.2                                |

## Cost Estimate Validation Process (CEVP) Report

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|-------------|--------------------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| PHT-6       | North Portland Harbor Transit GMP/Award                      | 12/15/2029      | 12/15/2029           | 0.0                                        | 0.0                                 |
| PHT-7       | North Portland Harbor Transit Construction                   | 12/15/2029      | 3/16/2032            | 48.1                                       | 58.2                                |
| PHT-8       | North Portland Harbor Transit Construction - In-Water Work   | 12/15/2029      | 4/12/2031            | 0.0                                        | 0.0                                 |
| PHT-9       | North Portland Harbor Transit Construction Closeout          | 3/16/2032       | 6/16/2032            | 5.4                                        | 6.8                                 |
| -           | -                                                            | -               | -                    | -                                          | -                                   |
| WAF-1       | WA Station Finishes Design/Utilities                         | 12/2/2025       | 3/18/2029            | 0.0                                        | 0.0                                 |
| WAF-2       | WA Station Finishes Ad                                       | 7/12/2029       | 7/12/2029            | 0.0                                        | 0.0                                 |
| WAF-3       | WA Station Finishes Bid (DBB)                                | 7/12/2029       | 11/11/2029           | 0.0                                        | 0.0                                 |
| WAF-4       | WA Station Finishes NTP                                      | 11/11/2029      | 11/11/2029           | 0.0                                        | 0.0                                 |
| WAF-5       | WA Station Finishes Construction                             | 12/10/2033      | 12/13/2034           | 0.2                                        | 0.2                                 |
| -           | -                                                            | -               | -                    | -                                          | -                                   |
| ORF-1       | OR Station Finishes Design/Utilities                         | 12/2/2025       | 3/21/2029            | 0.1                                        | 0.1                                 |
| ORF-2       | OR Station Finishes Ad                                       | 7/12/2029       | 7/12/2029            | 0.0                                        | 0.0                                 |
| ORF-3       | OR Station Bid (DBB)                                         | 7/12/2029       | 11/11/2029           | 0.0                                        | 0.0                                 |
| ORF-4       | OR Station Finishes NTP                                      | 11/11/2029      | 11/11/2029           | 0.0                                        | 0.0                                 |
| ORF-5       | OR Station Finishes Construction                             | 7/10/2033       | 9/12/2034            | 0.1                                        | 0.2                                 |
| -           | -                                                            | -               | -                    | -                                          | -                                   |
| RJT-1       | Ruby Junction TriMet Facility RFQ Prep                       | 12/2/2025       | 5/4/2026             | 6.4                                        | 6.6                                 |
| RJT-2       | Ruby Junction TriMet Facility RFQ                            | 5/4/2026        | 5/4/2026             | 0.0                                        | 0.0                                 |
| RJT-3       | Ruby Junction TriMet Facility Selection/Final Design (GC/CM) | 5/4/2026        | 4/11/2029            | 44.9                                       | 48.6                                |
| RJT-4       | Ruby Junction Right of Way                                   | 4/8/2026        | 12/5/2028            | 15.4                                       | 16.4                                |
| RJT-5       | Ruby Junction GMP/Award                                      | 4/11/2029       | 4/11/2029            | 0.0                                        | 0.0                                 |
| RJT-6       | Ruby Junction Construction / TriMet Move                     | 4/11/2029       | 11/9/2031            | 260.1                                      | 309.5                               |
| -           | -                                                            | -               | -                    | -                                          | -                                   |

## Cost Estimate Validation Process (CEVP) Report

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|-------------|--------------------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| CBF-1       | 65th St. CTRAN O&M Bus Facility Design                       | 12/2/2025       | 4/8/2028             | 2.2                                        | 2.3                                 |
| CBF-2       | 65th St. CTRAN O&M Bus Facility Right of Way                 | 7/1/2025        | 7/1/2025             | 0.0                                        | 0.0                                 |
| CBF-3       | 65th St. CTRAN O&M Bus Facility Ad                           | 7/10/2029       | 7/10/2029            | 0.0                                        | 0.0                                 |
| CBF-4       | 65th St. CTRAN O&M Bus Facility Bid (DBB)                    | 7/10/2029       | 11/11/2029           | 0.3                                        | 0.4                                 |
| CBF-5       | 65th St. CTRAN O&M Bus Facility NTP                          | 11/11/2029      | 11/11/2029           | 0.0                                        | 0.0                                 |
| CBF-6       | 65th St. CTRAN O&M Bus Facility Construction                 | 11/11/2029      | 7/8/2031             | 10.1                                       | 12.1                                |
| -           | -                                                            | -               | -                    | -                                          | -                                   |
| LRV-1       | Develop LRV Specifications                                   | 9/9/2025        | 4/9/2027             | 5.3                                        | 5.5                                 |
| LRV-2       | Light Rail Vehicles RFP                                      | 11/1/2027       | 11/1/2027            | 0.0                                        | 0.0                                 |
| LRV-3       | Light Rail Vehicles Procurement                              | 11/1/2027       | 3/8/2029             | 4.5                                        | 5.0                                 |
| LRV-4       | Light Rail Vehicles NTP                                      | 3/8/2029        | 3/8/2029             | 0.0                                        | 0.0                                 |
| LRV-5       | Light Rail Vehicles Manufacture, Deliver Group One           | 3/8/2029        | 6/1/2032             | 104.7                                      | 125.7                               |
| LRV-6       | Light Rail Vehicles Test, Commission Group One               | 6/1/2032        | 2/2/2033             | 21.8                                       | 27.9                                |
| LRV-7       | Light Rail Vehicles Deliver/Commission Remaining 17 Vehicles | 2/2/2033        | 10/30/2033           | 23.9                                       | 31.3                                |
| -           | -                                                            | -               | -                    | -                                          | -                                   |
| CBP-1       | Bus Procurement Design                                       | 12/2/2025       | 11/3/2027            | 0.7                                        | 0.8                                 |
| CBP-2       | Bus Procurement Ad                                           | 11/3/2027       | 11/3/2027            | 0.0                                        | 0.0                                 |
| CBP-3       | Bus Procurement Bid (DBB)                                    | 11/3/2027       | 3/6/2028             | 0.1                                        | 0.1                                 |
| CBP-4       | Bus Procurement NTP                                          | 3/6/2028        | 3/6/2028             | 0.0                                        | 0.0                                 |
| CBP-5       | Bus Procurement Fabrication/Delivery/Testing                 | 3/6/2028        | 7/9/2031             | 9.8                                        | 11.4                                |
| -           | -                                                            | -               | -                    | -                                          | -                                   |
| CBS-1       | Bus Shelters Design / Utilities                              | 12/2/2025       | 3/20/2029            | 0.3                                        | 0.4                                 |
| CBS-2       | Bus Shelters Ad                                              | 7/12/2029       | 7/12/2029            | 0.0                                        | 0.0                                 |
| CBS-3       | Bus Shelters Bid (DBB)                                       | 7/12/2029       | 11/11/2029           | 0.0                                        | 0.0                                 |
| CBS-4       | Bus Shelters NTP                                             | 11/11/2029      | 11/11/2029           | 0.0                                        | 0.0                                 |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                                         | Base Start Date | Base Completion Date | Base Cost (July 2025, millions of dollars) | Base Cost (millions of YOE dollars) |
|-------------|-----------------------------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| CBS-5       | Bus Shelters Construction                                             | 11/11/2029      | 11/11/2030           | 1.0                                        | 1.2                                 |
| CBS-6       | Bus Shelters Right of Way                                             | 7/1/2025        | 7/1/2025             | 0.0                                        | 0.0                                 |
| -           | -                                                                     | -               | -                    | -                                          | -                                   |
| MDI-1       | Marine Drive Interchange Design / RFQ Prep                            | 4/24/2035       | 11/2/2038            | 48.9                                       | 70.4                                |
| MDI-2       | Marine Drive Interchange RFQ                                          | 11/2/2038       | 11/2/2038            | 0.0                                        | 0.0                                 |
| MDI-3       | Marine Drive Interchange Selection (CM/GC) / Final Design             | 11/2/2038       | 6/13/2040            | 22.4                                       | 34.8                                |
| MDI-4       | Marine Drive Interchange Right of Way                                 | 4/25/2036       | 11/1/2038            | 11.0                                       | 19.2                                |
| MDI-5       | Marine Drive Interchange GMP/Award                                    | 6/13/2040       | 6/13/2040            | 0.0                                        | 0.0                                 |
| MDI-6       | Marine Drive Interchange Construction                                 | 3/18/2042       | 3/19/2045            | 289.8                                      | 521.8                               |
| -           | -                                                                     | -               | -                    | -                                          | -                                   |
| NER-1       | N. Expo Road Design                                                   | 9/7/2038        | 4/19/2042            | 3.1                                        | 4.9                                 |
| NER-2       | N. Expo Road Right of Way                                             | 4/18/2040       | 4/19/2042            | 0.1                                        | 0.3                                 |
| NER-3       | N. Expo Road Ad                                                       | 4/19/2042       | 4/19/2042            | 0.0                                        | 0.0                                 |
| NER-4       | N. Expo Road Bid (DBB)                                                | 4/19/2042       | 8/22/2042            | 0.3                                        | 0.5                                 |
| NER-5       | N. Expo Road NTP                                                      | 8/22/2042       | 8/22/2042            | 0.0                                        | 0.0                                 |
| NER-6       | N. Expo Road Construction                                             | 8/20/2043       | 6/20/2045            | 16.6                                       | 30.7                                |
| -           | -                                                                     | -               | -                    | -                                          | -                                   |
| OSB-1       | Oregon I-5 SB RFQ Prep                                                | 12/1/2029       | 6/4/2030             | 11.0                                       | 12.9                                |
| OSB-2       | Oregon I-5 SB RFQ                                                     | 6/4/2030        | 6/4/2030             | 0.0                                        | 0.0                                 |
| OSB-3       | Oregon I-5 SB Selection/Final Design (CM/GC) - incl. permitting, env. | 6/4/2030        | 9/13/2033            | 71.0                                       | 88.0                                |
| OSB-4       | Oregon I-5 SB Right of Way                                            | 6/11/2031       | 6/11/2033            | 0.0                                        | 0.0                                 |
| OSB-6       | Oregon I-5 SB GMP/Award                                               | 9/13/2033       | 9/13/2033            | 0.0                                        | 0.0                                 |
| OSB-7       | Oregon I-5 SB Construction                                            | 5/24/2034       | 12/16/2037           | 399.3                                      | 568.3                               |
| OSB-8       | Oregon I-5 SB Construction - In-Water Work                            | 9/19/2034       | 4/15/2037            | 0.0                                        | 0.0                                 |
| OSB-9       | Oregon I-5 SB Closeout                                                | 12/16/2037      | 3/19/2038            | 31.3                                       | 47.3                                |
| -           | -                                                                     | -               | -                    | -                                          | -                                   |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                                                                    | Base Start Date | Base Completion Date | Base Cost (July 2025, millions of dollars) | Base Cost (millions of YOY dollars) |
|-------------|--------------------------------------------------------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| PHD-1       | N. Portland Harbor Bridge Demo Design / Utilities / Cultural Resources                           | 10/6/2032       | 5/17/2036            | 5.8                                        | 7.8                                 |
| PHD-2       | N. Portland Harbor Bridge Demo Ad                                                                | 5/17/2036       | 5/17/2036            | 0.0                                        | 0.0                                 |
| PHD-3       | N. Portland Harbor Bridge Demo Bid (DBB)                                                         | 5/17/2036       | 9/17/2036            | 0.5                                        | 0.8                                 |
| PHD-4       | N. Portland Harbor Bridge Demo NTP                                                               | 9/17/2036       | 9/17/2036            | 0.0                                        | 0.0                                 |
| PHD-5       | N. Portland Harbor Bridge Demolition                                                             | 12/16/2037      | 12/19/2039           | 28.9                                       | 44.9                                |
| PHD-6       | N. Portland Harbor Bridge Demo Right of Way                                                      | 7/1/2025        | 7/1/2025             | 0.0                                        | 0.0                                 |
| -           | -                                                                                                | -               | -                    | -                                          | -                                   |
| ONB-1       | Oregon I-5 NB RFQ Prep                                                                           | 10/31/2035      | 4/1/2036             | 12.4                                       | 17.3                                |
| ONB-2       | Oregon I-5 NB RFQ                                                                                | 4/1/2036        | 4/1/2036             | 0.0                                        | 0.0                                 |
| ONB-3       | Oregon I-5 NB Selection (CM/GC) / Final Design - incl. Permitting, Utilities, Cultural Resources | 4/1/2036        | 8/10/2038            | 69.7                                       | 101.5                               |
| ONB-4       | Oregon I-5 NB Right of Way                                                                       | 5/8/2036        | 5/9/2038             | 16.2                                       | 28.2                                |
| ONB-6       | Oregon I-5 NB GMP/Award                                                                          | 8/10/2038       | 8/10/2038            | 0.0                                        | 0.0                                 |
| ONB-7       | Oregon I-5 NB Construction                                                                       | 12/19/2039      | 6/22/2043            | 429.9                                      | 727.1                               |
| -           | -                                                                                                | -               | -                    | -                                          | -                                   |
| HIS-1       | Hayden Island Surface Street Design to 100%                                                      | 7/6/2037        | 2/17/2041            | 12.9                                       | 19.8                                |
| HIS-2       | Hayden Island Surface Street Right of Way                                                        | 2/15/2039       | 2/16/2041            | 7.1                                        | 14.1                                |
| HIS-3       | Hayden Island Surface Street Ad                                                                  | 2/17/2041       | 2/17/2041            | 0.0                                        | 0.0                                 |
| HIS-4       | Hayden Island Surface Street Bid (DBB)                                                           | 2/17/2041       | 12/18/2041           | 3.0                                        | 4.9                                 |
| HIS-5       | Hayden Island Surface Street NTP                                                                 | 12/18/2041      | 12/18/2041           | 0.0                                        | 0.0                                 |
| HIS-6       | Hayden Island Surface Street Construction                                                        | 12/18/2042      | 6/20/2045            | 66.6                                       | 121.7                               |
| -           | -                                                                                                | -               | -                    | -                                          | -                                   |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                          | Base Start Date | Base Completion Date | Base Cost (July 2025, millions of dollars) | Base Cost (millions of YOY dollars) |
|-------------|--------------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| EPR-1       | Evergreen P&R Agreements/Utilities/Cultural Resources  | 4/1/2029        | 4/4/2031             | 7.6                                        | 8.9                                 |
| EPR-2       | Evergreen P&R Right of Way                             | 4/1/2029        | 4/2/2031             | 7.9                                        | 9.7                                 |
| EPR-3       | Evergreen P&R RFP                                      | 4/4/2031        | 4/4/2031             | 0.0                                        | 0.0                                 |
| EPR-4       | Evergreen P&R Procurement (DB)                         | 4/4/2031        | 11/6/2031            | 2.2                                        | 2.7                                 |
| EPR-5       | Evergreen P&R NTP                                      | 11/6/2031       | 11/6/2031            | 0.0                                        | 0.0                                 |
| EPR-6       | Evergreen P&R Final Design/ Permits                    | 11/6/2031       | 8/5/2032             | 2.8                                        | 3.5                                 |
| EPR-7       | Evergreen P&R Construction                             | 12/10/2033      | 2/13/2035            | 57.9                                       | 78.2                                |
| -           | -                                                      | -               | -                    | -                                          | -                                   |
| WPR-1       | Waterfront P&R Agreements/Utilities/Cultural Resources | 1/1/2029        | 1/4/2031             | 5.8                                        | 6.8                                 |
| WPR-2       | Waterfront P&R Right of Way                            | 1/1/2029        | 1/2/2031             | 2.4                                        | 2.9                                 |
| WPR-3       | Waterfront P&R RFP                                     | 1/4/2031        | 1/4/2031             | 0.0                                        | 0.0                                 |
| WPR-4       | Waterfront P&R Procurement (DB)                        | 1/4/2031        | 8/8/2031             | 1.7                                        | 2.1                                 |
| WPR-5       | Waterfront P&R NTP                                     | 8/8/2031        | 8/8/2031             | 0.0                                        | 0.0                                 |
| WPR-6       | Waterfront P&R Final Design/ Permits                   | 8/8/2031        | 5/7/2032             | 2.2                                        | 2.7                                 |
| WPR-7       | Waterfront P&R Construction                            | 7/7/2033        | 11/9/2034            | 57.6                                       | 76.9                                |
| -           | -                                                      | -               | -                    | -                                          | -                                   |
| MPL-1       | Mill Plain Agreements/Utilities/Arch.                  | 6/6/2029        | 6/6/2033             | 27.2                                       | 33.2                                |
| MPL-2       | Mill Plain Right of Way                                | 12/10/2031      | 12/11/2033           | 2.0                                        | 2.9                                 |
| MPL-3       | Mill Plain RFP                                         | 12/11/2033      | 12/11/2033           | 0.0                                        | 0.0                                 |
| MPL-4       | Mill Plain Procurement (DB)                            | 12/11/2033      | 7/13/2034            | 4.0                                        | 5.3                                 |
| MPL-5       | Mill Plain NTP                                         | 7/13/2034       | 7/13/2034            | 0.0                                        | 0.0                                 |
| MPL-6       | Mill Plain Final Design/ Permits                       | 7/13/2034       | 4/16/2035            | 5.2                                        | 7.0                                 |
| MPL-7       | Mill Plain Construction                                | 4/14/2036       | 2/13/2040            | 174.3                                      | 264.1                               |
| -           | -                                                      | -               | -                    | -                                          | -                                   |
| WAN-1       | Washington North Agreements/Utilities/CR               | 6/4/2031        | 12/11/2033           | 20.3                                       | 25.7                                |
| WAN-2       | Washington North Right of Way                          | 12/11/2031      | 12/10/2033           | 14.5                                       | 20.5                                |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name                                           | Base Start Date | Base Completion Date | Base Cost (July 2025, millions of dollars) | Base Cost (millions of YOE dollars) |
|-------------|---------------------------------------------------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| WAN-3       | Washington North RFP                                    | 12/11/2033      | 12/11/2033           | 0.0                                        | 0.0                                 |
| WAN-4       | Washington North Procurement (DB)                       | 12/11/2033      | 7/13/2034            | 4.7                                        | 6.2                                 |
| WAN-5       | Washington North NTP                                    | 7/13/2034       | 7/13/2034            | 0.0                                        | 0.0                                 |
| WAN-6       | Washington North Final Design/Permits                   | 7/13/2034       | 4/15/2035            | 6.1                                        | 8.2                                 |
| WAN-7       | Washington North Construction                           | 2/13/2037       | 12/15/2040           | 170.6                                      | 265.4                               |
| -           | -                                                       | -               | -                    | -                                          | -                                   |
| PCT-1       | Preconstruction Tolling Design/Utilities                | 7/1/2025        | 3/9/2026             | 7.1                                        | 7.2                                 |
| PCT-2       | Preconstruction Tolling Ad                              | 3/9/2026        | 3/9/2026             | 0.0                                        | 0.0                                 |
| PCT-3       | Preconstruction Tolling Bid (DBB)                       | 3/9/2026        | 6/25/2026            | 3.0                                        | 3.1                                 |
| PCT-4       | Preconstruction Tolling NTP                             | 6/25/2026       | 6/25/2026            | 0.0                                        | 0.0                                 |
| PCT-5       | Preconstruction Tolling Construction / Toll Integration | 6/25/2026       | 4/19/2027            | 36.2                                       | 38.4                                |
| -           | -                                                       | -               | -                    | -                                          | -                                   |
| WHM-1       | West Hayden Island Mitigation Design/Utilities          | 8/1/2027        | 2/29/2028            | 0.0                                        | 0.0                                 |
| WHM-2       | West Hayden Island Mitigation Ad                        | 2/29/2028       | 2/29/2028            | 0.0                                        | 0.0                                 |
| WHM-3       | West Hayden Island Mitigation Bid (DBB)                 | 2/29/2028       | 7/1/2028             | 0.0                                        | 0.0                                 |
| WHM-4       | West Hayden Island Mitigation NTP                       | 7/1/2028        | 7/1/2028             | 0.0                                        | 0.0                                 |
| WHM-5       | West Hayden Island Mitigation Construction              | 7/1/2028        | 10/1/2028            | 0.0                                        | 0.0                                 |
| WHM-5'      | West Hayden Island Mitigation Construction Complete     | 10/1/2028       | 10/1/2028            | 0.0                                        | 0.0                                 |
| WHM-5"      | West Hayden Island Mitigation Construction Complete     | 10/1/2028       | 10/1/2028            | 0.0                                        | 0.0                                 |
| WHM-6       | West Hayden Island Mitigation Right of Way              | 4/8/2026        | 2/28/2028            | 2.4                                        | 2.5                                 |
| -           | -                                                       | -               | -                    | -                                          | -                                   |
| CRB-18      | Mitigation                                              | 3/13/2028       | 3/14/2029            | 141.1                                      | 141.1                               |
| -           | -                                                       | -               | -                    | -                                          | -                                   |

## Cost Estimate Validation Process (CEVP) Report

| Activity ID | Activity Name | Base Start Date | Base Completion Date | Base Cost (July 2025, millions of dollars) | Base Cost (millions of YOE dollars) |
|-------------|---------------|-----------------|----------------------|--------------------------------------------|-------------------------------------|
| CIG-4'      | FTA FFGA      | 9/3/2028        | 9/3/2028             | 0.0                                        | 0.0                                 |
| -           | <b>Total</b>  | -               | -                    | <b>7,811.9</b>                             | <b>10,207.4</b>                     |

## Appendix E – Risk Register

The full Program risk register is provided in this appendix. The following notes apply:

1. All cost impacts are assessed in current terms and do not include indirect costs resulting from Program delays. Cost escalation and indirect costs are calculated automatically through the simulation model.
2. “Minor” means potential impacts for individual risks or opportunities of less than \$10M and 2 months OR the likelihood of more significant less than 5% (i.e., 1 chance in 20).
3. Ranges in impacts are expressed by their 10th, most likely value, and 90th percentiles, and typically truncated at zero. They are assumed to be represented by a fitted 3-point Pert distribution unless otherwise noted. Ranged impacts are assumed to be independent of one another unless otherwise noted.
4. Cost and schedule impacts are to specific identified activities (see flowchart). In some cases where the impacts are spread over many activities, for simplicity the impacts might be assigned to one or a few activities.
5. Schedule impacts are for specific activities, regardless of critical path, which will be calculated by the model.
6. Some events in this register are a function of base costs or durations. When those base costs or durations are assessed to be uncertain (see flowchart and cost estimate summary), the corresponding event should consider (include) changes to the base resulting from the simulated base uncertainty.
7. Correlation assumptions for occurrence and impact of risks that apply to multiple packages are noted in the risk register.

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                     |                                                                  |                       |                          |             |                  |                          |             |                  |                                   |               |                                                                                                                                            |                      |
|--------------------------------------------------------------------|---------------------|------------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|-------------|------------------|-----------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Risk Identification                                                |                     |                                                                  |                       | Quantitative Analysis    |             |                  |                          |             |                  |                                   | CEVP Workshop |                                                                                                                                            |                      |
|                                                                    |                     |                                                                  |                       | Post-Managed State       |             |                  |                          |             |                  |                                   |               |                                                                                                                                            |                      |
| ID #                                                               | Discipline Category | Risk Event Title                                                 | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |             |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                                                                                                                        | Bridge Span Scenario |
|                                                                    |                     |                                                                  |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) |                                   |               |                                                                                                                                            |                      |
| 1                                                                  | Civil / Drainage    | Stormwater Facilities                                            | Threat                | \$5 M                    | \$10 M      | \$15 M           |                          |             |                  | 10%                               | Minor         | All construction activities                                                                                                                | Both Fixed & Movable |
| 3                                                                  | Civil / Drainage    | Lack Of Downstream Conveyance Capacity                           | Threat                | \$0.5 M                  | \$1 M       | \$3 M            |                          |             |                  | 20%                               | Minor         |                                                                                                                                            | Both Fixed & Movable |
| 4                                                                  | Construction        | Damage to Adjacent Structures (Other)                            | Threat                | \$1 M                    | \$5 M       | \$10 M           |                          |             |                  | 15%                               | Minor         |                                                                                                                                            | Both Fixed & Movable |
| 7                                                                  | Construction        | River Bridge Final Design/ Mobilization Schedule too Aggressive  | Threat                | \$5 M                    | \$10 M      | \$15 M           | 1.0                      | 3.0         | 5.0              | 50%                               | Elsewhere     |                                                                                                                                            | Both Fixed & Movable |
| 8                                                                  | Construction        | Complex Bridge Approach MOT & Staging                            | Threat                | \$5 M                    | \$10 M      | \$20 M           |                          |             |                  | 25%                               | Modeled       | CBA-6 - Approaches Stage 1 (Assign)                                                                                                        | Both Fixed & Movable |
| 9                                                                  | Construction        | Arterial Bridge Sequencing                                       | Threat                | \$10 M                   | \$20 M      | \$30 M           |                          |             |                  | 20%                               | Modeled       | ONB-7 - Oregon NB Construction                                                                                                             | Both Fixed & Movable |
| 10                                                                 | Construction        | River Conditions Impact In-Water Construction                    | Threat                | \$0 M                    | \$1 M       | \$5 M            | 0.5                      | 1.0         | 3.0              | 15%                               | Minor         |                                                                                                                                            | Both Fixed & Movable |
| 13                                                                 | Construction        | Approach MOT Scope                                               | Threat                | \$0 M                    | \$3 M       | \$6 M            |                          |             |                  | 20%                               | Minor         |                                                                                                                                            | Both Fixed & Movable |
| 14                                                                 | Construction        | Staging and Phasing Among Contracts: NPH Bridges and Connections | Threat                | \$5 M                    | \$8 M       | \$10 M           | 1.0                      | 2.0         | 3.0              | 50%                               | Modeled       | PHD-5 - NPH Bridge Demo                                                                                                                    | Both Fixed & Movable |
| 15                                                                 | Construction        | Material Procurement Delays: Roadway                             | Threat                |                          |             |                  | 0.0                      | 1.0         | 6.0              | 10%                               | Modeled       | SRA-7, HIA-5, HIS-6, NER-6, MPL-7, WAN-7, PCT-5                                                                                            | Both Fixed & Movable |
| 16                                                                 | Construction        | Material Procurement Delays: Transit                             | Threat                |                          |             |                  | 3.0                      | 4.0         | 6.0              | 20%                               | Modeled       | LRT-6, LRT-11, LRT-7, LRT-8, LRT-10, LRT-9, WAF-5, ORF-5, LRF-4, RJT-6, CBF-6, CBS-5, EPR-7, WPR-7 (Major transit construction activities) | Both Fixed & Movable |
| 19                                                                 | Construction        | Construction Noise and Vibration                                 | Threat                |                          |             |                  |                          |             |                  |                                   | Minor         |                                                                                                                                            | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                      |                                                                  |                       |                          |             |                  |                          |                          |                  |                                   |               |                                                                |                      |
|--------------------------------------------------------------------|----------------------|------------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|--------------------------|------------------|-----------------------------------|---------------|----------------------------------------------------------------|----------------------|
| Risk Identification                                                |                      |                                                                  |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                                                                |                      |
|                                                                    |                      |                                                                  |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                                                                |                      |
| ID #                                                               | Discipline Category  | Risk Event Title                                                 | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                                            | Bridge Span Scenario |
|                                                                    |                      |                                                                  |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                                                                |                      |
| 21                                                                 | Construction         | Construction Staging                                             | Opportunity           | -\$22 M                  | -\$5 M      | \$0 M            |                          |                          |                  | 25%                               | Minor         |                                                                | Both Fixed & Movable |
| 25                                                                 | Construction         | Civil and Systems Contractor Interface / Coordination            | Threat                | \$4 M                    | \$6 M       | \$12 M           | 1.0                      | 2.0                      | 3.0              | 50%                               | Elsewhere     |                                                                | Both Fixed & Movable |
| 26                                                                 | Contract Procurement | CRB: Failure to reach GMP results in Re-Procurement              | Threat                | \$2 M                    | \$4 M       | \$8 M            | 12.0                     | 15.0                     | 18.0             | 1%                                | Minor         |                                                                | Both Fixed & Movable |
| 27                                                                 | Contract Procurement | Limited Bid Responses Results in Re-Procurement: Other Contracts | Threat                | \$2 M                    | \$4 M       | \$8 M            | 12.0                     | 15.0                     | 18.0             | 10%                               | Modeled       | EPR-4, WPR-4, MPL-4, WAN-4 (DB Procurement activities)         | Both Fixed & Movable |
| 28                                                                 | Contract Procurement | Bid Protest                                                      | Threat                |                          |             |                  | 0.5                      | 1.0                      | 2.0              | 50%                               | Minor         |                                                                | Both Fixed & Movable |
| 32                                                                 | Program Management   | Change in Project Delivery Method / Contract Packaging           | Threat                | \$1 M                    | \$2 M       | \$3 M            | 3.0                      | 6.0                      | 9.0              | 75%                               | Excluded      |                                                                | Both Fixed & Movable |
| 38                                                                 | Environmental        | Environmental Regulations Change                                 | Threat                |                          |             |                  | 0.0                      | 3.0                      | 6.0              | 10%                               | Minor         |                                                                | Both Fixed & Movable |
| 39                                                                 | Environmental        | Section 106 - Analysis and Programmatic Agreement                | Threat                | \$0 M                    | \$0 M       | \$1 M            | 1.0                      | 2.0                      | 4.0              | 20%                               | Elsewhere     | ENV-3                                                          | Both Fixed & Movable |
| 40                                                                 | Environmental        | Inadvertent Discoveries                                          | Threat                | \$2 M                    | \$5 M       | \$10 M           | 6.0                      | 9.0                      | 18.0             | 40%                               | Modeled       | CRB-15, CBA-6, CBA-9, SRA-7, HIA-5, LRT-7, LRT-8, WAN-7, MPL-7 | Both Fixed & Movable |
| 41                                                                 | Environmental        | Section 4(f), 6(f), and Federal Lands to Parks - Delta Park      | Threat                | \$0 M                    | \$1 M       | \$1 M            | 1.0                      | 2.0                      | 6.0              | 10%                               | Minor         |                                                                | Both Fixed & Movable |
| 44                                                                 | Environmental        | Final Supplemental EIS (FSEIS)                                   | Threat                |                          |             |                  | 1.0                      | 3.0                      | 6.0              | 30%                               | Modeled       | ENV-4a<br>Finalize EIS                                         | Both Fixed & Movable |
| 45                                                                 | Environmental        | Public Comments on Draft Supplemental EIS (DSEIS)                | Threat                |                          |             |                  | 1.0                      | 2.0                      | 3.0              | 10%                               | Minor         |                                                                | Both Fixed & Movable |
| 46                                                                 | Environmental        | External Agency NEPA Reviews                                     | Threat                |                          |             |                  | 1.0                      | 3.0                      | 6.0              | 30%                               | Modeled       | Split between ENV-4a (finalize FSEIS) and ENV-4b (Issue ROD)   | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                     |                                                                      |                       |                          |             |                  |                          |             |                  |                                      |               |                                                                                           |                      |
|--------------------------------------------------------------------|---------------------|----------------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|-------------|------------------|--------------------------------------|---------------|-------------------------------------------------------------------------------------------|----------------------|
| Risk Identification                                                |                     |                                                                      |                       | Quantitative Analysis    |             |                  |                          |             |                  |                                      | CEVP Workshop |                                                                                           |                      |
|                                                                    |                     |                                                                      |                       | Post-Managed State       |             |                  |                          |             |                  |                                      |               |                                                                                           |                      |
| ID #                                                               | Discipline Category | Risk Event Title                                                     | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |             |                  | Likelihood<br>of Impact Occurring    | Disposition   | Impacted Activities                                                                       | Bridge Span Scenario |
|                                                                    |                     |                                                                      |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) |                                      |               |                                                                                           |                      |
| 47                                                                 | Environmental       | FHWA and FTA NEPA Review/Participation                               | Threat                |                          |             |                  | 3.0                      | 6.0         | 9.0              | 50%                                  | Elsewhere     | covered by #46                                                                            | Both Fixed & Movable |
| 49                                                                 | Environmental       | Post-ROD NEPA Challenge                                              | Threat                | \$1 M                    | \$5 M       | \$10 M           | 1.0                      | 6.0         | 18.0             | 10%                                  | Modeled       | ENV-5a (Post-ROD milestone linked to construction NTPs)                                   | Both Fixed & Movable |
| 51                                                                 | Environmental       | USACE Permitting Delays (Nav Channel)                                | Threat                |                          |             |                  | 1.0                      | 3.0         | 6.0              | 10%                                  | Minor         |                                                                                           | Both Fixed & Movable |
| 52                                                                 | Environmental       | USACE Permitting Delays (Levee)                                      | Threat                |                          |             |                  | 3.0                      | 6.0         | 9.0              | 15%                                  | Modeled       | PHT-4a - North Portland Harbor Transit Permits<br>MDA-2 - Marine Drive Design/Permitting  | Both Fixed & Movable |
| 53                                                                 | Environmental       | USCG Bridge Permit Delay                                             | Threat                |                          |             |                  | 1.0                      | 2.0         | 3.0              | 25%                                  | Modeled       | CRB-8a (CRB 60% design)<br>PHT-4a (NPH Bridge Permit)                                     | Fixed Span           |
| 54                                                                 | Environmental       | State Agency Land Use Permit Delays                                  | Threat                |                          |             |                  | 3.0                      | 4.5         | 6.0              | 10%                                  | Minor         |                                                                                           | Both Fixed & Movable |
| 56                                                                 | Environmental       | Natural Resource Mitigation and Conservation                         | Threat                | \$2 M                    | \$4 M       | \$6 M            | 3.0                      | 6.0         | 18.0             | 30%                                  | Modeled       | Cost to PRG-1b - Program Management Post-ROD<br>Time to ENV-7 - USACE 401/404/408 Permits | Both Fixed & Movable |
| 58                                                                 | Environmental       | FEMA Flood Map Revisions                                             | Threat                |                          |             |                  | 9.0                      | 12.0        | 18.0             | Fixed Span: 10%<br>Movable Span: 15% | Modeled       | CRB-8a - 30%-60% design,<br>CBR-8b - Prep for early works (apply to both)                 | Both Fixed & Movable |
| 60                                                                 | Environmental       | Hazardous Materials - Liability Associated with Property Acquisition | Threat                | \$3 M                    | \$5 M       | \$10 M           |                          |             |                  | 50%                                  | Minor         |                                                                                           | Both Fixed & Movable |
| 63                                                                 | Environmental       | Additional Measures to Achieve Climate Conditions                    | Threat                | \$5 M                    | \$15 M      | \$25 M           |                          |             |                  | 35%                                  | Elsewhere     |                                                                                           | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                     |                                                                        |                       |                          |             |                  |                          |             |                  |                                   |               |                                                                                                              |                      |
|--------------------------------------------------------------------|---------------------|------------------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|-------------|------------------|-----------------------------------|---------------|--------------------------------------------------------------------------------------------------------------|----------------------|
| Risk Identification                                                |                     |                                                                        |                       | Quantitative Analysis    |             |                  |                          |             |                  |                                   | CEVP Workshop |                                                                                                              |                      |
|                                                                    |                     |                                                                        |                       | Post-Managed State       |             |                  |                          |             |                  |                                   |               |                                                                                                              |                      |
| ID #                                                               | Discipline Category | Risk Event Title                                                       | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |             |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                                                                                          | Bridge Span Scenario |
|                                                                    |                     |                                                                        |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) |                                   |               |                                                                                                              |                      |
| 65                                                                 | Civil / Drainage    | Relocation of 60" Culvert Beneath I-5                                  | Threat                |                          |             |                  |                          |             |                  |                                   | In the Base   |                                                                                                              | Both Fixed & Movable |
| 67                                                                 | Finance             | FTA Approval Delayed for Entry into Engineering                        | Threat                |                          |             |                  | 2.0                      | 4.0         | 8.0              | 40%                               | Modeled       | CIG-1 - FTA CIG Process to 30%                                                                               | Both Fixed & Movable |
| 68                                                                 | Finance             | Transit O&M Funding: Fixed Span                                        | Threat                |                          |             |                  | 3.0                      | 6.0         | 12.0             | 40%                               | Modeled       | AGR-3 - Other Critical Transit Agreements                                                                    | Fixed Span           |
| 77                                                                 | Geotechnical        | Bridge Foundation Changes - Design                                     | Threat                |                          |             |                  |                          |             |                  |                                   | Minor         |                                                                                                              | Fixed Span           |
| 78                                                                 | Geotechnical        | Bridge Foundation Changes - Construction                               | Threat                | \$1 M                    | \$10 M      | \$25 M           | 2.0                      | 3.0         | 6.0              | 20%                               | Modeled       | CRB-15 - Columbia River Bridge Construction - Set Girders/Deck NB/SB                                         | Both Fixed & Movable |
| 79                                                                 | Geotechnical        | Additional or Changed Method of Ground Improvement                     | Threat                | \$30 M                   | \$45 M      | \$60 M           |                          |             |                  | 50%                               | Modeled       | Split among<br>CRB-12 - CRB Foundations/GI<br>CBA-6 - Approaches Stage 1<br>MDA-5 - Marine Drive Pkg A<br>CN | Both Fixed & Movable |
| 82                                                                 | Geotechnical        | Conflicts With Existing Foundations - NPH                              | Threat                | \$3 M                    | \$5 M       | \$7 M            | 1.0                      | 2.0         | 3.0              | 25%                               | Modeled       | PHT-7 - North Portland Harbor Transit Construction                                                           | Both Fixed & Movable |
| 84                                                                 | Geotechnical        | Damage/ Settlement of Post Hospital                                    | Threat                | \$1 M                    | \$2 M       | \$3 M            | 0.0                      | 1.0         | 3.0              | 10%                               | Minor         |                                                                                                              | Both Fixed & Movable |
| 86                                                                 | Roadway Design      | Partner Agency Design Review Processes - 30% Design Package            | Threat                |                          |             |                  | 0.0                      | 1.0         | 2.0              | 20%                               | Minor         |                                                                                                              | Both Fixed & Movable |
| 87                                                                 | Roadway Design      | Partner Agency Design Review Processes - Subsequent Packages, 60%, 90% | Threat                |                          |             |                  | 1.0                      | 2.0         | 3.0              | 20%                               | Modeled       | CBA-3c, SRA-1, HIA-0, LRT-2, PHT-5, HIG-3, MDA-2, LRF-2                                                      | Both Fixed & Movable |
| 88                                                                 | Interagency Coord.  | Partner Agency Agreement Delays: Roadway                               | Threat                |                          |             |                  | 1.0                      | 3.5         | 6.0              | 20%                               | Modeled       | CRB-3, CBA-1, SRA-1, HIA-0 (Design/ Agreements activities for each package)                                  | Both Fixed & Movable |
| 89                                                                 | Interagency Coord.  | Aesthetics Support with Partner Agencies                               | Threat                |                          |             |                  | 1.0                      | 3.0         | 6.0              | 15%                               | Elsewhere     |                                                                                                              | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                     |                                                                                                       |                       |                          |             |                  |                          |                          |                  |                                   |               |                                                                                                |                      |
|--------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|--------------------------|------------------|-----------------------------------|---------------|------------------------------------------------------------------------------------------------|----------------------|
| Risk Identification                                                |                     |                                                                                                       |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                                                                                                |                      |
|                                                                    |                     |                                                                                                       |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                                                                                                |                      |
| ID #                                                               | Discipline Category | Risk Event Title                                                                                      | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                                                                            | Bridge Span Scenario |
|                                                                    |                     |                                                                                                       |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                                                                                                |                      |
| 90                                                                 | Interagency Coord.  | Local Parking                                                                                         | Threat                | \$5 M                    | \$10 M      | \$20 M           |                          |                          |                  | 25%                               | Elsewhere     |                                                                                                | Both Fixed & Movable |
| 91                                                                 | Interagency Coord.  | Loss of Alignment with Partner Agencies                                                               | Threat                |                          |             |                  | 1.0                      | 4.0                      | 9.0              | 30%                               | Elsewhere     |                                                                                                | Fixed Span           |
| 93                                                                 | Interagency Coord.  | Partner Requests - Data/Analysis                                                                      | Threat                |                          |             |                  | 1.0                      | 1.5                      | 2.0              | 10%                               | Minor         |                                                                                                | Both Fixed & Movable |
| 99                                                                 | Right-of-Way        | Additional Cost Associated with Expo Center Construction Impacts                                      | Threat                |                          |             |                  |                          |                          |                  |                                   | Elsewhere     |                                                                                                | Both Fixed & Movable |
| 101                                                                | Maint. Of Traffic   | Maintenance of Traffic (MOT) Mitigation                                                               | Threat                | \$0 M                    | \$4 M       | \$7 M            | 0.0                      | 5.0                      | 9.0              | 25%                               | Modeled       | MDA-5 - Marine Drive A Construction                                                            | Both Fixed & Movable |
| 102                                                                | Construction        | Conflicts Among IBR Contracts (SR-14 Package A and Approaches)                                        | Threat                |                          |             |                  | 1.0                      | 3.0                      | 6.0              | 50%                               | Modeled       | SRA-7 -SR-14 construction                                                                      | Both Fixed & Movable |
| 104                                                                | Market Conditions   | Uncertainty in Construction Cost Inflation Rate                                                       | Threat                | \$0 M                    | \$0 M       | \$500 M          |                          |                          |                  | 50%                               | Modeled       | All construction activities                                                                    | Both Fixed & Movable |
| 105                                                                | Market Conditions   | Uncertain Market Conditions: Number of Bidders and Pricing (River Bridge Contract, Fixed Span Option) | Threat                | \$84 M                   | \$251 M     | \$419 M          |                          |                          |                  | 75%                               | Modeled       | CRB-8a, CRB-8b, CRB-9, CRB-12, CRB-13, CRB-14, CRB-15, CRB-16, CRB-17 (all CRB PDB activities) | Fixed Span           |
| 106                                                                | Market Conditions   | Uncertain Market Conditions: Number of Bidders and Pricing (Other Contracts)                          | Threat                | \$106 M                  | \$213 M     | \$319 M          |                          |                          |                  | 50%                               | Modeled       | All construction activities except CRB, CBA, and major transit packages                        | Both Fixed & Movable |
| 107                                                                | Market Conditions   | Skilled Labor Availability                                                                            | Threat                | \$0 M                    | \$10 M      | \$19 M           |                          |                          |                  | 20%                               | Minor         |                                                                                                | Both Fixed & Movable |
| 108                                                                | Market Conditions   | DBE/FSBE Requirements                                                                                 | Threat                | \$0 M                    | \$1 M       | \$10 M           |                          |                          |                  | 50%                               | Minor         |                                                                                                | Both Fixed & Movable |
| 110                                                                | Program Management  | Uncertainty in PE (Professional Services) Cost Inflation Rate                                         | Threat                | \$0 M                    | \$0 M       | \$115 M          |                          |                          |                  | 50%                               | Modeled       | All PE and programmatic activities                                                             | Both Fixed & Movable |
| 117                                                                | Program Management  | Contract Administration / change management Issues                                                    | Threat                |                          |             |                  | 1.0                      | 3.0                      | 6.0              | 50%                               | Modeled       | CBR-15, CBA-6, LRT-6 (River Bridge, Approaches, Transit construction)                          | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                      |                                                        |                       |                          |             |                  |                          |                          |                  |                                   |               |                                                                                                                                                                                                |                      |
|--------------------------------------------------------------------|----------------------|--------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|--------------------------|------------------|-----------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Risk Identification                                                |                      |                                                        |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                                                                                                                                                                                                |                      |
|                                                                    |                      |                                                        |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                                                                                                                                                                                                |                      |
| ID #                                                               | Discipline Category  | Risk Event Title                                       | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                                                                                                                                                                            | Bridge Span Scenario |
|                                                                    |                      |                                                        |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                                                                                                                                                                                                |                      |
| 118                                                                | Program Management   | Program Coordination Issues                            | Threat                | \$0.5 M                  | \$2 M       | \$10 M           | 3.0                      | 6.0                      | 12.0             | 40%                               | Modeled       | CRB-1b - Develop CRB RFP,<br>CBA-1 - CBA Design/RFQ, DES-<br>3 - 60% design for transit                                                                                                        | Both Fixed & Movable |
| 121                                                                | Public Affairs       | Turnover of Current Local Elected                      | Threat                |                          |             |                  | 1.0                      | 3.0                      | 6.0              | 10%                               | Elsewhere     |                                                                                                                                                                                                | Both Fixed & Movable |
| 122                                                                | Contract Procurement | Completion of Project Labor Agreements                 | Threat                |                          |             |                  | 1.0                      | 3.0                      | 12.0             | 25%                               | Modeled       | CRB-5 - CRB PDB Proposals/<br>Selection<br><br>CBA-3a - Approaches PDB<br>Proposals/ Selection                                                                                                 | Both Fixed & Movable |
| 123                                                                | Public Affairs       | Community Benefits and Associated Agreement            | Threat                | \$20 M                   | \$40 M      | \$80 M           |                          |                          |                  | 40%                               | Modeled       | Split among CBA-6<br>(Approaches: 50%), LRT-7<br>(Waterfront Station: 12.5%),<br>LRT-8 (Evergreen Station:<br>12.5%), LRT-10 (Hayden Island<br>Station: 12.5%), LRT-9 (Expo<br>Station: 12.5%) | Both Fixed & Movable |
| 124                                                                | Public Affairs       | Tolling Policies                                       | Threat                |                          |             |                  | 1.0                      | 3.0                      | 6.0              | 5%                                | Minor         |                                                                                                                                                                                                | Both Fixed & Movable |
| 127                                                                | Public Involvement   | Additional Community Engagement                        | Threat                |                          |             |                  | 1.0                      | 2.0                      | 3.0              | 20%                               | Minor         |                                                                                                                                                                                                | Both Fixed & Movable |
| 129                                                                | Railroad             | BNSF Agreement Delays                                  | Threat                |                          |             |                  | 1.0                      | 3.0                      | 12.0             | 15%                               | Modeled       | CBA-3e - BNSF Agreements                                                                                                                                                                       | Both Fixed & Movable |
| 130                                                                | Railroad             | Railroad Agreement Term Sheets Delays                  | Threat                |                          |             |                  | 1.0                      | 3.0                      | 6.0              | 25%                               | Modeled       | CIG-1 - FTA CIG Process to<br>30%                                                                                                                                                              | Both Fixed & Movable |
| 131                                                                | Railroad             | BNSF Coordination Issues during Construction           | Threat                |                          |             |                  | 0.0                      | 3.0                      | 6.0              | 20%                               | Modeled       | SRA-7, CBA-6, LRT-6, PCT-5                                                                                                                                                                     | Both Fixed & Movable |
| 135                                                                | Right-of-Way         | ROW Cost Increases                                     | Threat                | \$10 M                   | \$20 M      | \$30 M           |                          |                          |                  | 50%                               | Modeled       | All ROW activities                                                                                                                                                                             | Both Fixed & Movable |
| 136                                                                | Right-of-Way         | Need for Additional ROW Acquisition Identified (Other) | Threat                | \$10 M                   | \$30 M      | \$50 M           |                          |                          |                  | 50%                               | Modeled       | All ROW activities                                                                                                                                                                             | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                     |                                                                  |                       |                          |             |                  |                          |                          |                  |                                   |               |                                                                                                                                                                     |                      |
|--------------------------------------------------------------------|---------------------|------------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|--------------------------|------------------|-----------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Risk Identification                                                |                     |                                                                  |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                                                                                                                                                                     |                      |
|                                                                    |                     |                                                                  |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                                                                                                                                                                     |                      |
| ID #                                                               | Discipline Category | Risk Event Title                                                 | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                                                                                                                                                 | Bridge Span Scenario |
|                                                                    |                     |                                                                  |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                                                                                                                                                                     |                      |
| 138                                                                | Right-of-Way        | Additional Condemnation - Washington                             | Threat                |                          |             |                  | 6.0                      | 12.0                     | 18.0             | 5%                                | Modeled       | CRB-6a, CRB-6b, SRA-3, CBA-4<br>- WA key ROW activities                                                                                                             | Both Fixed & Movable |
| 139                                                                | Right-of-Way        | Lack of Appraisers                                               | Threat                |                          |             |                  | 1.0                      | 1.5                      | 2.0              | 25%                               | Minor         |                                                                                                                                                                     | Both Fixed & Movable |
| 140                                                                | Right-of-Way        | Relocation Delays - Oregon                                       | Threat                |                          |             |                  | 1.0                      | 2.0                      | 3.0              | 10%                               | Minor         |                                                                                                                                                                     | Both Fixed & Movable |
| 141                                                                | Right-of-Way        | Relocation Delays - Washington                                   | Threat                |                          |             |                  | 1.0                      | 2.0                      | 6.0              | 10%                               | Minor         |                                                                                                                                                                     | Both Fixed & Movable |
| 144                                                                | Right-of-Way        | Late Changes in Design - ROW Schedule<br>(Columbia River Bridge) | Threat                |                          |             |                  | 1.0                      | 6.0                      | 12.0             | 5%                                | Minor         | CRB non-critical ROW<br>CRB-6b - CRB Remaining ROW                                                                                                                  | Both Fixed & Movable |
| 145                                                                | Right-of-Way        | Late Changes in Design - ROW Schedule<br>(Other)                 | Threat                |                          |             |                  | 1.0                      | 6.0                      | 12.0             | 20%                               | Modeled       | CRB-6b - CRB Non-Critical<br>ROW, HIA-3 - Hayden Island<br>RIW, SRA-3 - SR-14 ROW, PHT<br>3 - Portland Harbor Transit<br>ROW, HIG-4 - Hayden Island<br>Guideway ROW | Both Fixed & Movable |
| 146                                                                | Railroad            | BNSF Property Rights Resolution                                  | Threat                |                          |             |                  | 0.0                      | 6.0                      | 12.0             | 10%                               | Modeled       | CBA-4 - CBA ROW                                                                                                                                                     | Both Fixed & Movable |
| 151                                                                | Right-of-Way        | Uncertainty in ROW Cost Inflation Rate                           | Threat                | \$0 M                    | \$0 M       | \$25 M           |                          |                          |                  | 50%                               | Modeled       | All ROW activities                                                                                                                                                  | Both Fixed & Movable |
| 160                                                                | Roadway Design      | Additional Full Depth Reconstruction                             | Threat                | \$5 M                    | \$10 M      | \$20 M           |                          |                          |                  | 15%                               | Modeled       | MPL-7, WAN-7, OSB-7, ONB-7                                                                                                                                          | Both Fixed & Movable |
| 161                                                                | Roadway Design      | Local Street Scope, Vancouver                                    | Threat                | \$0.5 M                  | \$2 M       | \$5 M            |                          |                          |                  | 15%                               | Minor         |                                                                                                                                                                     | Both Fixed & Movable |
| 165                                                                | Roadway Design      | Change to Design/Configuration of<br>Hayden Island Interchange   | Threat                |                          |             |                  | 6.0                      | 12.0                     | 18.0             | 10%                               | Modeled       | OSB-3 - Oregon SB Design,<br>OSB-7 - Oregon SB<br>Construction                                                                                                      | Both Fixed & Movable |
| 166                                                                | Roadway Design      | Alt. Interchange at Marine Drive                                 | Opportunity           | -\$30 M                  | -\$20 M     | -\$10 M          |                          |                          |                  | 50%                               | Modeled       | MDA-5 - Marine Drive Pkg A<br>CN                                                                                                                                    | Both Fixed & Movable |
| 169                                                                | Roadway Design      | USACE Levee Project Coordination                                 | Threat                |                          |             |                  | 1.0                      | 2.0                      | 3.0              | 10%                               | Minor         |                                                                                                                                                                     | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                     |                                                    |                       |                          |             |                  |                          |                          |                  |                                   |               |                                                                      |                      |
|--------------------------------------------------------------------|---------------------|----------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|--------------------------|------------------|-----------------------------------|---------------|----------------------------------------------------------------------|----------------------|
| Risk Identification                                                |                     |                                                    |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                                                                      |                      |
|                                                                    |                     |                                                    |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                                                                      |                      |
| ID #                                                               | Discipline Category | Risk Event Title                                   | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                                                  | Bridge Span Scenario |
|                                                                    |                     |                                                    |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                                                                      |                      |
| 170                                                                | Roadway Design      | Shared-Use Bike/Ped Path Design (OR)               | Threat                | \$1 M                    | \$20 M      | \$40 M           |                          |                          |                  | 10%                               | Minor         |                                                                      | Both Fixed & Movable |
| 171                                                                | Roadway Design      | Local Street Scope - Portland                      | Threat                | \$20 M                   | \$30 M      | \$40 M           |                          |                          |                  | 5%                                | Modeled       | MDI-6 - Marine Drive Interchange Construction                        | Both Fixed & Movable |
| 173                                                                | Roadway Design      | Contractor Innovation:<br>River Bridge PDB Package | Opportunity           | -\$30 M                  | -\$20 M     | -\$10 M          | -6.0                     | -3.0                     | -1.0             | 35%                               | Modeled       | CRB-15 - Columbia River Bridge Construction - Set Girders/Deck NB/SB | Fixed Span           |
| 174                                                                | Roadway Design      | Contractor Innovation:<br>Other Packages           | Opportunity           | -\$120 M                 | -\$80 M     | -\$60 M          | -6.0                     | -3.0                     | -1.0             | 35%                               | Modeled       | CBA-6 / CBA-8, HIG-6, PHT-7                                          | Both Fixed & Movable |
| 175                                                                | Roadway Design      | Opposition for Single Aux Lane                     | Threat                | \$80 M                   | \$94 M      | \$110 M          | 3.0                      | 6.0                      | 12.0             | 10%                               | Minor         |                                                                      | Both Fixed & Movable |
| 176                                                                | Structures          | Navigational Clearance - Construction Impacts      | Threat                | \$100 M                  | \$200 M     | \$300 M          | 0.0                      | 6.0                      | 12.0             | 50%                               | In the Base   |                                                                      | Movable Span         |
| 178                                                                | Structures          | Structure Aesthetic Changes - River Bridge         | Threat                | \$50 M                   | \$75 M      | \$100 M          |                          |                          |                  | 25%                               | Modeled       | CRB-15 - Columbia River Bridge Construction - Set Girders/Deck NB/SB | Both Fixed & Movable |
| 179                                                                | Structures          | Structure Aesthetic Changes - NPH Bridges          | Threat                | \$25 M                   | \$50 M      | \$100 M          |                          |                          |                  | 15%                               | Modeled       | PHT-7 - North Portland Harbor Transit Construction                   | Both Fixed & Movable |
| 180                                                                | Structures          | Structure Aesthetic Change - Other                 | Threat                | \$25 M                   | \$50 M      | \$100 M          |                          |                          |                  | 10%                               | Modeled       | CBA-6, CBA-8, CBA-9, SRA-7, OSB-7, ONB-7, MPL-6, WAN-7               | Both Fixed & Movable |
| 182                                                                | Structures          | Changed Seismic Design Criteria                    | Threat                | \$20 M                   | \$40 M      | \$60 M           |                          |                          |                  | 10%                               | Modeled       | CBA-6, CBA-8, CBA-9, OSB-7, ONB-7, MPL-6, WAN-7                      | Both Fixed & Movable |
| 189                                                                | Traffic             | Additional ATMS Infrastructure                     | Threat                | \$0 M                    | \$2 M       | \$4 M            |                          |                          |                  | 30%                               | Minor         |                                                                      | Both Fixed & Movable |
| 190                                                                | Traffic             | Approval of ARR / Intersection Control Decisions   | Threat                |                          |             |                  |                          |                          |                  |                                   | Elsewhere     |                                                                      | Both Fixed & Movable |
| 192                                                                | Transit             | Expo Center Station Modifications                  | Opportunity           | -\$30 M                  | -\$20 M     | -\$5 M           |                          |                          |                  | 25%                               | Excluded      | LRT-9 - Expo Center Station Construction                             | Both Fixed & Movable |
| 194                                                                | Transit             | Hayden Island Station/NPH Design Changes           | Opportunity           | -\$15 M                  | -\$10 M     | -\$5 M           |                          |                          |                  | 50%                               | Modeled       | LRT-10 - Hayden Island Station Construction                          | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                     |                                                                 |                       |                          |             |                  |                          |                          |                  |                                   |               |                                                                                                                      |                      |
|--------------------------------------------------------------------|---------------------|-----------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|--------------------------|------------------|-----------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------|----------------------|
| Risk Identification                                                |                     |                                                                 |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                                                                                                                      |                      |
|                                                                    |                     |                                                                 |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                                                                                                                      |                      |
| ID #                                                               | Discipline Category | Risk Event Title                                                | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                                                                                                  | Bridge Span Scenario |
|                                                                    |                     |                                                                 |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                                                                                                                      |                      |
| 195                                                                | Transit             | Eliminate/Reduce Separate LRT Overnight Facility at Expo Center | Opportunity           | -\$64 M                  | -\$15 M     | \$0 M            |                          |                          |                  | 50%                               | Excluded      | LRF-4 - LRT Overnight Facility Construction                                                                          | Both Fixed & Movable |
| 202                                                                | Transit             | Evergreen Park-and-Ride Design/Scope Changes                    | Opportunity           | -\$58 M                  | -\$29 M     | \$0 M            |                          |                          |                  | 25%                               | Excluded      | EPR-7 - Evergreen Park & Ride Construction                                                                           | Both Fixed & Movable |
| 203                                                                | Transit             | Waterfront Park-and-Ride Design/Scope Changes                   | Opportunity           | -\$57 M                  | -\$28 M     | \$0 M            |                          |                          |                  | 25%                               | Excluded      | WPR-7 - Waterfront Park & Ride Construction                                                                          | Both Fixed & Movable |
| 204                                                                | Transit             | Change to Embedded Track                                        | Threat                | \$150 M                  | \$200 M     | \$250 M          | 3.0                      | 6.0                      | 9.0              | 5%                                | Modeled       | CRB-15, CBA-6, PHT-7, HIG-6 (Guideway construction activities)<br>DES-3, CRB-8a (Transit 60% design, CRB 60% design) | Both Fixed & Movable |
| 210                                                                | Transit             | Existing Yellow Line Intersection Improvements                  | Threat                | \$5 M                    | \$10 M      | \$15 M           |                          |                          |                  | 10%                               | Minor         |                                                                                                                      | Both Fixed & Movable |
| 214                                                                | Transit             | C-TRAN Express Bus Vehicle Procurement                          | Opportunity           | -\$12 M                  | -\$10 M     | -\$8.0 M         |                          |                          |                  | 60%                               | Excluded      | CBP-5 - Bus Procurement                                                                                              | Both Fixed & Movable |
| 215                                                                | Transit             | Transit LRT O&M Agreement                                       | Threat                |                          |             |                  | 3.0                      | 6.0                      | 9.0              | 20%                               | Modeled       | AGR-3 - Other Critical Transit Agreements                                                                            | Both Fixed & Movable |
| 216                                                                | Transit             | Delay to FTA Letter of No Prejudice (LONP)                      | Threat                |                          |             |                  | 3.0                      | 6.0                      | 12.0             | 25%                               | Modeled       | CIG-6 - Issue LONP                                                                                                   | Both Fixed & Movable |
| 217                                                                | Transit             | Additional Elements Required to Facilitate Future Transit O&M   | Threat                |                          |             |                  |                          |                          |                  |                                   | Elsewhere     |                                                                                                                      | Both Fixed & Movable |
| 218                                                                | Transit             | Systems Testing or Start-Up Delays: Fixed Span                  | Threat                |                          |             |                  | 3.0                      | 6.0                      | 9.0              | 40%                               | Modeled       | LRT-12 - LRT Testing & Commissioning                                                                                 | Fixed Span           |
| 220                                                                | Tribal Coord.       | Section 106 - Approach                                          | Threat                | \$10 M                   | \$15 M      | \$20 M           | 0.5                      | 1.0                      | 1.5              | 25%                               | Modeled       | PRG-1b - Programmatic Costs (post-ROD)                                                                               | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                      |                                                                           |                       |                          |             |                  |                          |             |                  |                                   |               |                                                                                                                                                     |                      |
|--------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|-------------|------------------|-----------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Risk Identification                                                |                      |                                                                           |                       | Quantitative Analysis    |             |                  |                          |             |                  |                                   | CEVP Workshop |                                                                                                                                                     |                      |
|                                                                    |                      |                                                                           |                       | Post-Managed State       |             |                  |                          |             |                  |                                   |               |                                                                                                                                                     |                      |
| ID #                                                               | Discipline Category  | Risk Event Title                                                          | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |             |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                                                                                                                                 | Bridge Span Scenario |
|                                                                    |                      |                                                                           |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) |                                   |               |                                                                                                                                                     |                      |
| 221                                                                | Tribal Coord.        | Tribal Consultation - Fisheries                                           | Threat                | \$5 M                    | \$10 M      | \$20 M           | 1.0                      | 3.0         | 6.0              | 30%                               | Modeled       | Cost to PRG-1b - Program Management Post-ROD<br><br>Time to each of ENV-7 - USACE 401/404/408 Permits and PHT-4a USACE permits for NPH/Marine Drive | Both Fixed & Movable |
| 223                                                                | Utilities Relocation | Scope of Utilities Required is Greater than Anticipated                   | Threat                | \$5 M                    | \$8 M       | \$10 M           | 3.0                      | 4.5         | 6.0              | 75%                               | Minor         |                                                                                                                                                     | Both Fixed & Movable |
| 224                                                                | Utilities Relocation | Utility Service Connection Uncertainty                                    | Opportunity           |                          |             |                  |                          |             |                  |                                   | Minor         |                                                                                                                                                     | Both Fixed & Movable |
| 225                                                                | Utilities Relocation | Delayed Completion of Utility Agreements and Permits                      | Threat                |                          |             |                  | 0.0                      | 3.0         | 6.0              | 5%                                | Elsewhere     |                                                                                                                                                     | Both Fixed & Movable |
| 226                                                                | Utilities Relocation | Utilities Take Longer Than Anticipated to Implement Relocation Plan (CRB) | Threat                |                          |             |                  | 2.0                      | 4.0         | 6.0              | 30%                               | Minor         |                                                                                                                                                     | Both Fixed & Movable |
| 227                                                                | Utilities Relocation | Utility Relocation Delays (Program-Wide)                                  | Threat                |                          |             |                  | 1.0                      | 3.0         | 6.0              | 20%                               | Modeled       | HIA-0, CBA-3d, SRA-2, PHT-5, HIG-3, MDA-2 (advance utility or final design activities)                                                              | Both Fixed & Movable |
| 233                                                                | Utilities Relocation | Unidentified Utilities Encountered During Construction                    | Threat                |                          |             |                  | 1.0                      | 2.0         | 6.0              | 20%                               | Modeled       | HIA-5, CBA-6, SRA-7, PHT-7, HIG-6, LRF-4, RJT-6, CBF-6, MDA-5, ONB-7, MDI-6, HIS-6, NER-6, MPL-7, WAN-7 (construction activities)                   | Both Fixed & Movable |
| 241                                                                | Other                | Indirect Cost of Project Delays (Owner, PM)                               | Threat                |                          |             |                  |                          |             |                  |                                   | Modeled       |                                                                                                                                                     | Both Fixed & Movable |
| 243                                                                | Other                | Aggregate minor risks / opportunities                                     | Threat                | \$0 M                    | \$63 M      | \$126 M          |                          |             |                  | 99%                               | Modeled       | All                                                                                                                                                 | Both Fixed & Movable |
| 244                                                                | Other                | Unidentified risks / opportunities                                        | Threat                | \$0 M                    | \$63 M      | \$126 M          | 0.0                      | 3.0         | 6.0              | 50%                               | Modeled       | All                                                                                                                                                 | Both Fixed & Movable |
| 249                                                                | Construction         | Work Package Interface                                                    | Threat                |                          |             |                  |                          |             |                  | 75%                               | Elsewhere     |                                                                                                                                                     | Both Fixed & Movable |
| 251                                                                | Environmental        | NEPA Delays - Movable Bridge                                              | Threat                |                          |             |                  | 1.0                      | 3.0         | 4.0              | 10%                               | Minor         |                                                                                                                                                     | Movable Span         |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                      |                                                            |                       |                          |             |                  |                          |                          |                  |                                   |               |                                             |                      |
|--------------------------------------------------------------------|----------------------|------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|--------------------------|------------------|-----------------------------------|---------------|---------------------------------------------|----------------------|
| Risk Identification                                                |                      |                                                            |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                                             |                      |
|                                                                    |                      |                                                            |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                                             |                      |
| ID #                                                               | Discipline Category  | Risk Event Title                                           | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                         | Bridge Span Scenario |
|                                                                    |                      |                                                            |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                                             |                      |
| 252                                                                | Environmental        | Section 4(f) - All Parks (Except Delta Park)               | Threat                |                          |             |                  | 1.0                      | 2.0                      | 6.0              | 5%                                | Minor         |                                             | Both Fixed & Movable |
| 253                                                                | Structures           | Design Delays - Movable Bridge                             | Threat                | \$1 M                    | \$2 M       | \$3 M            | 0.0                      | 2.0                      | 4.0              | 25%                               | Elsewhere     |                                             | Movable Span         |
| 255                                                                | Construction         | FAA Notification (Moveable Bridge)                         | Threat                |                          |             |                  |                          |                          |                  | 15%                               | Elsewhere     |                                             | Movable Span         |
| 257                                                                | Finance              | Delay to OR/WA Tolling Finance (Flow of Funds) Agreement   | Threat                |                          |             |                  | 3.0                      | 6.0                      | 12.0             | 5%                                | Excluded      |                                             | Both Fixed & Movable |
| 261                                                                | Construction         | Contract Interfaces                                        | Threat                |                          |             |                  | 3.0                      | 6.0                      | 12.0             | 50%                               | Elsewhere     |                                             | Both Fixed & Movable |
| 262                                                                | Finance              | State Funding Timing                                       | Threat                |                          |             |                  | 3.0                      | 12.0                     | 24.0             | 40%                               | Excluded      |                                             | Both Fixed & Movable |
| 264                                                                | Transit              | Ruby Junction Expansion                                    | Threat                |                          |             |                  | 1.0                      | 3.0                      | 6.0              | 10%                               | Modeled       | RJT-6 - Ruby Junction Facility Construction | Both Fixed & Movable |
| 266                                                                | Transit              | Interface Management at LRT Track/Systems Construction     | Threat                | \$1 M                    | \$2 M       | \$4 M            | 1.0                      | 3.0                      | 6.0              | 60%                               | Modeled       | LRT-6 - Plinths and Track Construction      | Both Fixed & Movable |
| 267                                                                | Tribal Coord.        | Tribal Workforce Engagement & Employment Rights            | Threat                |                          |             |                  | 1.0                      | 2.0                      | 3.0              | 25%                               | Modeled       | CRB-1b - Develop CRB RFP                    | Both Fixed & Movable |
| 271                                                                | Construction         | River User MOT During CRB Construction                     | Threat                | \$0 M                    | \$1.5 M     | \$3 M            | 0.0                      | 1.0                      | 2.0              | 10%                               | Minor         |                                             | Both Fixed & Movable |
| 272                                                                | Environmental        | Federal Lands to Parks                                     | Threat                |                          |             |                  | 1.0                      | 3.0                      | 6.0              | 5%                                | Minor         |                                             | Both Fixed & Movable |
| 273                                                                | Right-of-Way         | Trestle Connection to Hayden Island                        | Threat                | \$5 M                    | \$10 M      | \$20 M           |                          |                          |                  | 5%                                | Minor         |                                             | Both Fixed & Movable |
| 274                                                                | Finance              | IBR Program Seeks Federal Funding - CIG                    | Threat                |                          |             |                  | 12.0                     | 24.0                     | 48.0             | 30%                               | Excluded      |                                             | Both Fixed & Movable |
| 275                                                                | Contract Procurement | Approaches: Failure to Reach GMP Results in Re-Procurement | Threat                | \$2 M                    | \$4 M       | \$8 M            | 12.0                     | 15.0                     | 18.0             | 5%                                | Modeled       | CBA-3f - Approaches GMP Negotiations        | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                      |                                                                                       |                       |                          |             |                  |                          |                          |                  |                                   |               |                                                                         |                      |
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| Risk Identification                                                |                      |                                                                                       |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                                                                         |                      |
|                                                                    |                      |                                                                                       |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                                                                         |                      |
| ID #                                                               | Discipline Category  | Risk Event Title                                                                      | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                                                     | Bridge Span Scenario |
|                                                                    |                      |                                                                                       |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                                                                         |                      |
| 276                                                                | Utilities Relocation | Design Changes impact utility relocations                                             | Threat                |                          |             |                  | 0.0                      | 3.0                      | 18.0             | 20%                               | Elsewhere     |                                                                         | Both Fixed & Movable |
| 277                                                                | Utilities Relocation | Scope of Reimbursable Work is Greater than Anticipated                                | Threat                | \$5 M                    | \$10 M      | \$15 M           |                          |                          |                  | 50%                               | Modeled       | CBA-9 - Hayden Island Stages 1-3                                        | Both Fixed & Movable |
| 280                                                                | Utilities Relocation | Utilities Relocation Delays - Double Moves                                            | Threat                |                          |             |                  | 2.0                      | 4.0                      | 6.0              | 40%                               | Minor         |                                                                         | Both Fixed & Movable |
| 285                                                                | Environmental        | Unanticipated Mitigations Needed                                                      | Threat                | \$1 M                    | \$2 M       | \$3 M            |                          |                          |                  | 75%                               | Minor         |                                                                         | Both Fixed & Movable |
| 288                                                                | Right-of-Way         | Relocation Delays - (Hayden Island)                                                   | Threat                |                          |             |                  | 1.0                      | 2.0                      | 6.0              | 10%                               | Minor         | HIA-5 - Hayden Island Pkg A Construction                                | Both Fixed & Movable |
| 289                                                                | Right-of-Way         | Uncertainty in ROW Cost Inflation Rate                                                | Opportunity           | -\$25 M                  | \$0 M       | \$0 M            |                          |                          |                  | 50%                               | Modeled       | All ROW activities                                                      | Both Fixed & Movable |
| 290                                                                | Market Conditions    | Uncertainty in Construction Cost Inflation Rate                                       | Opportunity           | -\$500 M                 | \$0 M       | \$0 M            |                          |                          |                  | 50%                               | Modeled       |                                                                         | Both Fixed & Movable |
| 291                                                                | Market Conditions    | Uncertain Market Conditions: Number of Bidders and Pricing (River Bridge Contract)    | Opportunity           |                          |             |                  |                          |                          |                  |                                   | Minor         |                                                                         | Both Fixed & Movable |
| 292                                                                | Market Conditions    | Uncertain Market Conditions: Number of Bidders and Pricing (Approaches Contract)      | Threat                | \$77 M                   | \$154 M     | \$307 M          |                          |                          |                  | 75%                               | Modeled       | CBA-3c through CBA-12b (all approaches PDB activities)                  | Both Fixed & Movable |
| 293                                                                | Market Conditions    | Uncertain Market Conditions: Number of Bidders and Pricing (Approaches Contract)      | Opportunity           |                          |             |                  |                          |                          |                  |                                   | Minor         |                                                                         | Both Fixed & Movable |
| 294                                                                | Market Conditions    | Uncertain Market Conditions: Number of Bidders and Pricing (Other Contracts)          | Opportunity           | -\$159 M                 | -\$106 M    | -\$53 M          |                          |                          |                  | 20%                               | Modeled       | All construction activities except CRB, CBA, and major transit packages | Both Fixed & Movable |
| 295                                                                | Roadway Design       | Partner Agency Design Review Processes - 30% Design Package (River Bridge)            | Threat                |                          |             |                  | 0.0                      | 1.0                      | 2.0              | 20%                               | Minor         |                                                                         | Both Fixed & Movable |
| 296                                                                | Roadway Design       | Partner Agency Design Review Processes - Subsequent Packages, 60%, 90% (River Bridge) | Threat                |                          |             |                  | 1.0                      | 2.0                      | 3.0              | 10%                               | Minor         |                                                                         | Both Fixed & Movable |
| 297                                                                | Transit              | Track / Systems Design                                                                | Threat                | \$0.5 M                  | \$0.75 M    | \$1 M            | 1.0                      | 3.0                      | 6.0              | 50%                               | Elsewhere     |                                                                         | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                     |                                                                           |                       |                          |             |                  |                          |             |                  |                                   |               |                     |                      |
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| Risk Identification                                                |                     |                                                                           |                       | Quantitative Analysis    |             |                  |                          |             |                  |                                   | CEVP Workshop |                     |                      |
|                                                                    |                     |                                                                           |                       | Post-Managed State       |             |                  |                          |             |                  |                                   |               |                     |                      |
| ID #                                                               | Discipline Category | Risk Event Title                                                          | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |             |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities | Bridge Span Scenario |
|                                                                    |                     |                                                                           |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) |                                   |               |                     |                      |
| 299                                                                | Environmental       | Revised PNCD for Fixed-Span Bridge                                        | Threat                |                          |             |                  | 1.0                      | 2.0         | 3.0              | 35%                               | Elsewhere     |                     | Fixed Span           |
| 301                                                                | Structures          | Decision on Evergreen Complex                                             | Threat                |                          |             |                  |                          |             |                  |                                   | Minor         |                     | Both Fixed & Movable |
| 302                                                                | Construction        | Expiration of Manufactured Products Waiver                                | Threat                |                          |             |                  |                          |             |                  |                                   | In the Base   |                     | Both Fixed & Movable |
| 303                                                                | Construction        | Conflicting BABAA Requirements                                            | Threat                |                          |             |                  |                          |             |                  |                                   | Elsewhere     |                     | Both Fixed & Movable |
| 304                                                                | Construction        | BABAA-Defined Steel & Iron Products                                       | Threat                |                          |             |                  |                          |             |                  |                                   | Elsewhere     |                     | Both Fixed & Movable |
| 305                                                                | Construction        | BABAA-Defined (Permanently Installed) Construction Materials              | Threat                |                          |             |                  |                          |             |                  |                                   | Elsewhere     |                     | Both Fixed & Movable |
| 306                                                                | Construction        | BABAA-Defined Fabricated Materials                                        | Threat                |                          |             |                  |                          |             |                  |                                   | Elsewhere     |                     | Both Fixed & Movable |
| 307                                                                | Construction        | Non-Domestic Materials Waivers                                            | Threat                |                          |             |                  |                          |             |                  |                                   | Minor         |                     | Both Fixed & Movable |
| 311                                                                | Right-of-Way        | Early ROW Acquisition                                                     | Opportunity           |                          |             |                  | -5.0                     | -3.0        | -1.0             | 25%                               | Minor         |                     | Both Fixed & Movable |
| 312                                                                | Construction        | Maintenance of On/Off Ramps (Marine Drive Interchange)                    | Threat                |                          |             |                  |                          |             |                  |                                   | Minor         |                     | Both Fixed & Movable |
| 313                                                                | Roadway Design      | Maintenance of On/Off Ramps (Marine Drive Package A)                      | Threat                |                          |             |                  | 3.0                      | 6.0         | 9.0              | 5%                                | Elsewhere     |                     | Both Fixed & Movable |
| 317                                                                | Environmental       | Negotiations with Impacted Vessels and Fabricators (Affected River Users) | Threat                |                          |             |                  | 3.0                      | 6.0         | 9.0              | 90%                               | Elsewhere     |                     | Both Fixed & Movable |
| 319                                                                | Environmental       | Other Interested Parties / River Users                                    | Threat                |                          |             |                  | 3.0                      | 6.0         | 9.0              | 30%                               | Elsewhere     |                     | Both Fixed & Movable |
| 320                                                                | Environmental       | Comments During USCG Public Notice Period                                 | Threat                |                          |             |                  | 3.0                      | 6.0         | 12.0             | 30%                               | Elsewhere     |                     | Movable Span         |
| 321                                                                | Environmental       | Waterway Capacity                                                         | Threat                |                          |             |                  | 6.0                      | 12.0        | 18.0             | 50%                               | In the Base   |                     | Movable Span         |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                      |                                                                                |                       |                          |             |                  |                          |                          |                  |                                   |               |                                |                      |
|--------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|--------------------------|------------------|-----------------------------------|---------------|--------------------------------|----------------------|
| Risk Identification                                                |                      |                                                                                |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                                |                      |
|                                                                    |                      |                                                                                |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                                |                      |
| ID #                                                               | Discipline Category  | Risk Event Title                                                               | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities            | Bridge Span Scenario |
|                                                                    |                      |                                                                                |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                                |                      |
| 322                                                                | Environmental        | Duration for USCG to Issue New PNCD                                            | Threat                |                          |             |                  | 2.0                      | 2.5                      | 3.0              | 100%                              | Modeled       | EXT-1<br>Revised PNCD          | Both Fixed & Movable |
| 323                                                                | Environmental        | Support from External Parties                                                  | Opportunity           |                          |             |                  | -6.0                     | -4.0                     | -2.0             | 60%                               | Elsewhere     |                                | Fixed Span           |
| 324                                                                | Environmental        | Definition of "Reasonable Navigation"                                          | Threat                |                          |             |                  | 6.0                      | 9.0                      | 12.0             | 40%                               | Elsewhere     |                                | Movable Span         |
| 325                                                                | Roadway Design       | COV Pump Station/WSDOT Real Estate Restrictions                                | Threat                |                          |             |                  |                          |                          |                  |                                   | Minor         |                                | Both Fixed & Movable |
| 326                                                                | Contract Procurement | CRB RFP Review Periods Reduced or Removed                                      | Threat                |                          |             |                  |                          |                          |                  | 25%                               | N/A           |                                | Both Fixed & Movable |
| 327                                                                | Utilities Relocation | Condition of COV Waterlines                                                    | Threat                |                          |             |                  | 2.0                      | 3.0                      | 4.0              | 50%                               | Elsewhere     |                                | Both Fixed & Movable |
| 329                                                                | Program Management   | Bridge Configuration and Type Selection Multiple Options                       | Uncertainty           |                          |             |                  |                          |                          |                  |                                   | Elsewhere     |                                | Both Fixed & Movable |
| 330                                                                | Program Management   | RFP Timeline Results in Multiple NTPs and Increased Risk of Monetary Penalties | Threat                |                          |             |                  |                          |                          |                  |                                   | N/A           |                                | Both Fixed & Movable |
| 333                                                                | Public Affairs       | Opposition to LRT Results in Changed Program Definition                        | Threat                |                          |             |                  | 1.0                      | 2.0                      | 3.0              | 5%                                | Excluded      |                                | Both Fixed & Movable |
| 334                                                                | Finance              | State Funding Timing: change to transit-eligible                               | Threat                | \$1 M                    | \$2 M       | \$4 M            | 3.0                      | 12.0                     | 18.0             | 50%                               | Modeled       | CIG-3 (Readiness for FFGA)     | Both Fixed & Movable |
| 335                                                                | Transit              | Delay to OCS Design                                                            | Threat                |                          |             |                  | 1.0                      | 3.0                      | 5.0              | 50%                               | Modeled       | DES-2 - 30% Design for Transit | Both Fixed & Movable |
| 336                                                                | Program Management   | Agencies Reject RFQ Issuance Pre-ROD                                           | Threat                |                          |             |                  | 3.0                      | 3.0                      | 3.0              | 90%                               | Modeled       | CRB-1 - CRB Prelim. Design/RFQ | Both Fixed & Movable |
| 337                                                                | Program Management   | RFP Before ROD Results in Request for Extension                                | Threat                |                          |             |                  |                          |                          |                  |                                   | N/A           |                                | Both Fixed & Movable |
| 338                                                                | Delivery Method      | Compressed Design Schedule Results in Increased Contractor Price               | Threat                | \$2 M                    | \$5 M       | \$10 M           |                          |                          |                  | 50%                               | In the Base   |                                | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                      |                                                                         |                       |                          |             |                  |                          |             |                  |                                   |               |                                                        |                      |
|--------------------------------------------------------------------|----------------------|-------------------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|-------------|------------------|-----------------------------------|---------------|--------------------------------------------------------|----------------------|
| Risk Identification                                                |                      |                                                                         |                       | Quantitative Analysis    |             |                  |                          |             |                  |                                   | CEVP Workshop |                                                        |                      |
|                                                                    |                      |                                                                         |                       | Post-Managed State       |             |                  |                          |             |                  |                                   |               |                                                        |                      |
| ID #                                                               | Discipline Category  | Risk Event Title                                                        | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |             |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                                    | Bridge Span Scenario |
|                                                                    |                      |                                                                         |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) |                                   |               |                                                        |                      |
| 339                                                                | Program Management   | RFP Before ROD Results in Federal Non-Compliance                        | Threat                |                          |             |                  |                          |             |                  |                                   | N/A           |                                                        | Both Fixed & Movable |
| 340                                                                | Program Management   | RFP Before ROD Affects Bid Responses                                    | Threat                |                          |             |                  |                          |             |                  |                                   | N/A           |                                                        | Both Fixed & Movable |
| 341                                                                | Utilities Relocation | Utility Agreements Incomplete for Procurement                           | Threat                |                          |             |                  |                          |             |                  |                                   | Elsewhere     |                                                        | Both Fixed & Movable |
| 343                                                                | Environmental        | Agreement on Path for Cultural Resources                                | Threat                | \$0 M                    | \$0 M       | \$1 M            | 6.0                      | 9.0         | 18.0             | 20%                               | Modeled       | ENV-3 - Sec. 106 Programmatic Agrmt. & Mitigation Plan | Both Fixed & Movable |
| 348                                                                | Environmental        | Bridge Permit Delay Results in Changed Conditions                       | Threat                |                          |             |                  |                          |             |                  |                                   | N/A           |                                                        | Both Fixed & Movable |
| 349                                                                | Environmental        | Cultural Resources/Arch Work Incomplete for NTP #2                      | Threat                | \$0 M                    | \$0 M       | \$1 M            | 6.0                      | 12.0        | 24.0             | 25%                               | Elsewhere     |                                                        | Both Fixed & Movable |
| 350                                                                | Program Management   | Federal Staffing Reductions Impact Federal Reviews and Project Schedule | Threat                |                          |             |                  | 0.0                      | 1.0         | 2.0              | 20%                               | Elsewhere     |                                                        | Both Fixed & Movable |
| 351                                                                | Right-of-Way         | Floating Homes                                                          | Threat                |                          |             |                  | 6.0                      | 10.0        | 12.0             | 5%                                | Modeled       | PHT-3 - Portland Harbor Transit ROW                    | Both Fixed & Movable |
| 352                                                                | Right-of-Way         | WA Limited Access Hearing Findings and Order                            | Threat                |                          |             |                  | 6.0                      | 10.0        | 12.0             | 25%                               | Modeled       | ROW-1 - Limited Access Waiver / Finalize ROW Plans     | Both Fixed & Movable |
| 353                                                                | Transit              | Expo Overnight Facility Substantial Completion Delay                    | Threat                |                          |             |                  | 6.0                      | 9.0         | 12.0             | 10%                               | Modeled       | LRF-4 - LRT Overnight Facility Construction            | Both Fixed & Movable |
| 354                                                                | Transit              | Denial of Design Exception Request for Expo LRT Station                 | Threat                |                          |             |                  |                          |             |                  |                                   | Elsewhere     |                                                        | Both Fixed & Movable |
| 355                                                                | Transit              | 30% Transit Design Excluded from RFP                                    | Threat                |                          |             |                  |                          |             |                  |                                   | N/A           |                                                        | Both Fixed & Movable |
| 356                                                                | Program Management   | Provisions for Follow-on Contracts: Program Wide                        | Threat                | \$1 M                    | \$2 M       | \$3 M            | 3.0                      | 6.0         | 9.0              | 50%                               | Elsewhere     |                                                        | Both Fixed & Movable |
| 357                                                                | Transit              | PD Extension Denied                                                     | Threat                |                          |             |                  |                          |             |                  |                                   | Minor         |                                                        | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                      |                                                                     |                       |                          |             |                  |                          |                          |                  |                                   |               |                                   |                      |
|--------------------------------------------------------------------|----------------------|---------------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|--------------------------|------------------|-----------------------------------|---------------|-----------------------------------|----------------------|
| Risk Identification                                                |                      |                                                                     |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                                   |                      |
|                                                                    |                      |                                                                     |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                                   |                      |
| ID #                                                               | Discipline Category  | Risk Event Title                                                    | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities               | Bridge Span Scenario |
|                                                                    |                      |                                                                     |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                                   |                      |
| 358                                                                | Transit              | ROD Delayed Beyond Maximum Extension                                | Threat                |                          |             |                  |                          |                          |                  |                                   | Elsewhere     |                                   | Both Fixed & Movable |
| 359                                                                | Roadway Design       | Mill Plain Interchange Upgrades                                     | Opportunity           |                          |             |                  |                          |                          |                  |                                   | Minor         |                                   | Both Fixed & Movable |
| 361                                                                | Finance              | Local Transit Funds Allocation Delay                                | Threat                |                          |             |                  | 6.0                      | 12.0                     | 24.0             | 25%                               | Modeled       | DES-3 - 60% Design for Transit    | Both Fixed & Movable |
| 362                                                                | Transit              | Power Service Needs                                                 | Threat                | \$1 M                    | \$2 M       | \$3 M            |                          |                          |                  | 50%                               | Minor         |                                   | Both Fixed & Movable |
| 363                                                                | Public Affairs       | Local, State, and Federal Partner Misalignment                      | Threat                |                          |             |                  | 3.0                      | 6.0                      | 9.0              | 40%                               | Elsewhere     |                                   | Both Fixed & Movable |
| 365                                                                | Utilities Relocation | Power Service to Existing NB Bridge                                 | Threat                | \$5 M                    | \$10 M      | \$15 M           |                          |                          |                  | 20%                               | Modeled       | CBA-12b - CRB Partial Demo        | Both Fixed & Movable |
| 366                                                                | Contract Procurement | Third-Party Agreements Process                                      | Threat                |                          |             |                  | 0.0                      | 1.0                      | 2.0              | 30%                               | Minor         |                                   | Both Fixed & Movable |
| 367                                                                | Right-of-Way         | West Hayden Island Mitigation Parcel Legal Description              | Threat                |                          |             |                  | 1.0                      | 2.0                      | 3.0              | 50%                               | Minor         |                                   | Both Fixed & Movable |
| 368                                                                | Right-of-Way         | 30% Design for Transit Elements                                     | Threat                |                          |             |                  | 1.0                      | 3.0                      | 6.0              | 10%                               | Minor         |                                   | Both Fixed & Movable |
| 369                                                                | Right-of-Way         | DNR Aquatic Easements for Permanent and Temporary Bridge Footprints | Threat                |                          |             |                  | 6.0                      | 10.0                     | 12.0             | 25%                               | Elsewhere     |                                   | Both Fixed & Movable |
| 370                                                                | Right-of-Way         | Harbor Commission Permits                                           | Threat                |                          |             |                  | 6.0                      | 10.0                     | 12.0             | 25%                               | Elsewhere     |                                   | Both Fixed & Movable |
| 372                                                                | Transit              | Head-End System Upgrades at TriMet OCC                              | Threat                |                          |             |                  |                          |                          |                  |                                   | In the Base   |                                   | Both Fixed & Movable |
| 373                                                                | Transit              | Agency/Vendor/Program work for SCADA, Cameras, Communications, etc. | Threat                |                          |             |                  | 1.0                      | 3.0                      | 6.0              | 25%                               | Modeled       | LRT-11 - LRT Systems Construction | Both Fixed & Movable |
| 374                                                                | Transit              | Existing System Expansion vs System-Wide Upgrades                   | Threat                |                          |             |                  |                          |                          |                  |                                   | Elsewhere     |                                   | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                      |                                                                     |                       |                          |             |                  |                          |                          |                  |                                   |               |                                                                       |                      |
|--------------------------------------------------------------------|----------------------|---------------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|--------------------------|------------------|-----------------------------------|---------------|-----------------------------------------------------------------------|----------------------|
| Risk Identification                                                |                      |                                                                     |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                                                                       |                      |
|                                                                    |                      |                                                                     |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                                                                       |                      |
| ID #                                                               | Discipline Category  | Risk Event Title                                                    | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                                                   | Bridge Span Scenario |
|                                                                    |                      |                                                                     |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                                                                       |                      |
| 376                                                                | Transit              | Sole Sourcing for Specialty Items & Long Lead Times                 | Threat                |                          |             |                  |                          |                          |                  |                                   | Elsewhere     |                                                                       | Both Fixed & Movable |
| 377                                                                | Transit              | Transit Station Elevator Delivery                                   | Threat                |                          |             |                  |                          |                          |                  |                                   | Minor         |                                                                       | Both Fixed & Movable |
| 378                                                                | Transit              | TriMet SME Involvement in Cost Estimating Effort                    | Opportunity           |                          |             |                  |                          |                          |                  |                                   | Minor         |                                                                       | Both Fixed & Movable |
| 380                                                                | Transit              | Public Art Delivery and Responsibility                              | Threat                |                          |             |                  |                          |                          |                  | 10%                               | Minor         |                                                                       | Both Fixed & Movable |
| 381                                                                | Interagency Coord.   | Loss of Alignment with Partner Agencies Movable Span                | Threat                |                          |             |                  | 3.0                      | 6.0                      | 9.0              | 40%                               | Elsewhere     |                                                                       | Movable Span         |
| 382                                                                | Utilities Relocation | Power Supply for Movable Span Bridge                                | Threat                | \$10 M                   | \$20 M      | \$30 M           | 6.0                      | 9.0                      | 12.0             | 50%                               | Modeled       | CRB-15 - Columbia River Bridge Construction                           | Movable Span         |
| 383                                                                | Environmental        | Section 106 – Post-ROD Analysis and Implementation                  | Threat                | \$5 M                    | \$10 M      | \$15 M           | 9.0                      | 12.0                     | 18.0             | 30%                               | Modeled       | ENV-9, ENV-10, ENV-11 - Cultural Resources Survey CRB, HI, CRBA/SR-14 | Both Fixed & Movable |
| 384                                                                | Environmental        | Local Agency Land Use Permit Delays                                 | Threat                |                          |             |                  | 2.0                      | 4.0                      | 6.0              | 20%                               | Modeled       | CRB-8a, CBA-3c, DES-3 (60% design of key packages)                    | Both Fixed & Movable |
| 385                                                                | Maint. Of Traffic    | Median Width for CRB (Fixed Span)                                   | Opportunity           | -\$30 M                  | -\$20 M     | -\$10 M          |                          |                          |                  | 80%                               | Modeled       | Cost split between: CRB-15, CBA-8                                     | Fixed Span           |
| 386                                                                | Railroad             | Railroad Facilities Impact                                          | Threat                | \$0 M                    | \$0.5 M     | \$1 M            |                          |                          |                  | 10%                               | Minor         |                                                                       | Both Fixed & Movable |
| 387                                                                | Program Management   | Legal Descriptions Delay Start of ROW                               | Threat                |                          |             |                  |                          |                          |                  |                                   | Minor         |                                                                       | Both Fixed & Movable |
| 388                                                                | Construction         | Approach MOT Scope: Jantzen Drive                                   | Threat                | \$5 M                    | \$10 M      | \$15 M           |                          |                          |                  | 25%                               | Modeled       | HIA-5- Hayden Island Pkg. A Construction                              | Both Fixed & Movable |
| 389                                                                | Construction         | Seismic Design Criteria Impacts for Movable-Span Bridge Alternative | Threat                |                          |             |                  |                          |                          |                  |                                   | In the Base   |                                                                       | Movable Span         |
| 390                                                                | Maint. Of Traffic    | Improvements to Local Roads                                         | Threat                |                          |             |                  |                          |                          |                  |                                   | Elsewhere     |                                                                       | Both Fixed & Movable |
| 391                                                                | Traffic              | Interim ITS Elements                                                | Threat                |                          |             |                  |                          |                          |                  |                                   | Minor         |                                                                       | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                     |                                                                 |                       |                          |             |                  |                          |                          |                  |                                   |               |                                                                |                      |
|--------------------------------------------------------------------|---------------------|-----------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|--------------------------|------------------|-----------------------------------|---------------|----------------------------------------------------------------|----------------------|
| Risk Identification                                                |                     |                                                                 |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                                                                |                      |
|                                                                    |                     |                                                                 |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                                                                |                      |
| ID #                                                               | Discipline Category | Risk Event Title                                                | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                                            | Bridge Span Scenario |
|                                                                    |                     |                                                                 |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                                                                |                      |
| 392                                                                | Traffic             | Interim Tolling Elements                                        | Threat                | \$5 M                    | \$10 M      | \$20 M           |                          |                          |                  | 20%                               | Minor         |                                                                | Both Fixed & Movable |
| 393                                                                | Construction        | Combined Demolition Under One Contract                          | Opportunity           | -\$8 M                   | -\$4 M      | -\$2 M           | 0.0                      | 0.0                      | 0.0              | 25%                               | Elsewhere     |                                                                | Both Fixed & Movable |
| 394                                                                | Environmental       | Demolition Permit                                               | Threat                | \$0 M                    | \$1 M       | \$2 M            | 6.0                      | 18.0                     | 24.0             | 15%                               | Minor         |                                                                | Both Fixed & Movable |
| 395                                                                | Construction        | SB Bridge Demo Constraints/Access                               | Threat                | \$10 M                   | \$20 M      | \$40 M           | 3.0                      | 6.0                      | 9.0              | 15%                               | Modeled       | CBR-6 - Interstate Bridge Removal Construction                 | Both Fixed & Movable |
| 396                                                                | Construction        | Unknown Debris in River                                         | Threat                | \$0.5 M                  | \$1 M       | \$2 M            | 1.0                      | 2.0                      | 4.0              | 20%                               | Modeled       | CBR-7 - Interstate Bridge Removal Construction - In-Water Work | Both Fixed & Movable |
| 397                                                                | Construction        | Perform Demo Without Cofferdams                                 | Opportunity           | -\$8 M                   | -\$4 M      | -\$2 M           | 0.0                      | 0.0                      | 0.0              | 10%                               | Minor         |                                                                | Both Fixed & Movable |
| 398                                                                | Program Management  | Provisions for Follow-on Contracts: CRB & Handoff to Approaches | Threat                | \$5 M                    | \$14 M      | \$28 M           | 1.0                      | 3.0                      | 6.0              | 25%                               | Elsewhere     |                                                                | Both Fixed & Movable |
| 399                                                                | Program Management  | Provisions for Follow-on Contracts: Transit CIG                 | Threat                | \$0 M                    | \$0.3 M     | \$0.6 M          | 0.0                      | 1.0                      | 2.0              | 15%                               | Elsewhere     |                                                                | Both Fixed & Movable |
| 400                                                                | Structures          | Structure Aesthetic Changes - Extradosed Bridge Type            | Threat                | \$12 M                   | \$24 M      | \$36 M           | 0.0                      | 0.0                      | 0.0              | 10%                               | Elsewhere     |                                                                | Fixed Span           |
| 401                                                                | Construction        | Restrictions on Navigation Channel Openings                     | Threat                | \$0 M                    | \$1 M       | \$2 M            | 3.0                      | 6.0                      | 9.0              | 20%                               | Modeled       | CRB-15 - Columbia River Bridge Construction                    | Both Fixed & Movable |
| 402                                                                | Construction        | Hazardous Materials Spill                                       | Threat                |                          |             |                  |                          |                          |                  |                                   | Minor         |                                                                | Both Fixed & Movable |
| 403                                                                | Public Affairs      | Loss of Funding Support - Movable Span                          | Threat                |                          |             |                  |                          |                          |                  |                                   | Excluded      |                                                                | Movable Span         |
| 404                                                                | Public Affairs      | Loss of Public Support - Movable Span                           | Threat                |                          |             |                  | 1.0                      | 2.0                      | 3.0              | 25%                               | Elsewhere     |                                                                | Movable Span         |
| 405                                                                | Construction        | CRB Demo / Pier 8 Conflict                                      | Threat                | \$2 M                    | \$4 M       | \$6 M            |                          |                          |                  | 50%                               | Minor         |                                                                | Movable Span         |
| 406                                                                | Program Management  | Bridge Lift Operations Risk                                     | Threat                |                          |             |                  |                          |                          |                  |                                   | Excluded      |                                                                | Movable Span         |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                      |                                                                                                                |                       |                          |             |                  |                          |                          |                  |                                   |               |                                                  |                      |
|--------------------------------------------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|--------------------------|------------------|-----------------------------------|---------------|--------------------------------------------------|----------------------|
| Risk Identification                                                |                      |                                                                                                                |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                                                  |                      |
|                                                                    |                      |                                                                                                                |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                                                  |                      |
| ID #                                                               | Discipline Category  | Risk Event Title                                                                                               | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities                              | Bridge Span Scenario |
|                                                                    |                      |                                                                                                                |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                                                  |                      |
| 407                                                                | Construction         | Movable Span Testing & Commissioning                                                                           | Threat                |                          |             |                  | 1.0                      | 2.0                      | 3.0              | 50%                               | Modeled       | CRB-15 - Columbia River Bridge Construction      | Movable Span         |
| 408                                                                | Construction         | Procurement Delays (BABA)                                                                                      | Threat                |                          |             |                  |                          |                          |                  |                                   | Elsewhere     |                                                  | Movable Span         |
| 409                                                                | Contract Procurement | Specialty Contractor / Design Expertise Availability                                                           | Threat                |                          |             |                  |                          |                          |                  |                                   | Elsewhere     |                                                  | Movable Span         |
| 410                                                                | Roadway Design       | West Hayden Island Mitigation                                                                                  | Threat                | \$8 M                    | \$9 M       | \$10 M           |                          |                          |                  | 25%                               | Modeled       | WHM-5 - W. Hayden Island Mitigation Construction | Both Fixed & Movable |
| 411                                                                | Finance              | Annual FFGA Disbursements Amounts / Timing                                                                     | Threat                |                          |             |                  |                          |                          |                  |                                   | Elsewhere     |                                                  | Both Fixed & Movable |
| 412                                                                | Roadway Design       | Design coordination between CRB, Approaches Packages                                                           | Threat                |                          |             |                  | 2.0                      | 3.0                      | 4.0              | 90%                               | Modeled       | CBA-3c - Approaches 30% to 60% design            | Both Fixed & Movable |
| 413                                                                | Environmental        | USCG Revised PNCD Precludes Fixed Span                                                                         | Threat                | \$583 M                  | \$700 M     | \$840 M          | 15.0                     | 27.0                     | 39.0             | 50%                               | By Scenario   |                                                  | Fixed Span           |
| 414                                                                | Railroad             | BNSF property not available for Waterfront Station Access                                                      | Threat                | \$20 M                   | \$30 M      | \$40 M           |                          |                          |                  | 20%                               | Modeled       | LRT-7 - Waterfront Station Construction          | Both Fixed & Movable |
| 415                                                                | Contract Procurement | Impact of tariffs                                                                                              | Threat                | \$202 M                  | \$265 M     | \$359 M          |                          |                          |                  | 50%                               | Modeled       | All construction activities                      | Both Fixed & Movable |
| 416                                                                | Finance              | FTA Approval Delayed for FFGA                                                                                  | Threat                |                          |             |                  | 2.0                      | 4.0                      | 8.0              | 40%                               | Modeled       | CIG-3 - FTA Readiness Reviews for FFGA           | Both Fixed & Movable |
| 417                                                                | Roadway Design       | Additional preliminary design required to support Movable Span RFQ                                             | Threat                |                          |             |                  |                          |                          |                  |                                   | In the Base   |                                                  | Movable Span         |
| 418                                                                | Program Management   | Owner agency decision making following PNCD: Movable Span Scenario                                             | Threat                |                          |             |                  | 3.0                      | 6.0                      | 12.0             | 50%                               | Modeled       | CRB-1A - CRB Prelim. Design / Develop RFQ        | Movable Span         |
| 419                                                                | Public Affairs       | Third party agreements with transit, City of Vancouver, on future IBR infrastructure ownership and maintenance |                       |                          |             |                  |                          |                          |                  |                                   | Minor         |                                                  | Both Fixed & Movable |

| Interstate Bridge Replacement (IBR) - PROJECT RISK MANAGEMENT PLAN |                     |                                                                     |                       |                          |             |                  |                          |                          |                  |                                   |               |                     |                      |
|--------------------------------------------------------------------|---------------------|---------------------------------------------------------------------|-----------------------|--------------------------|-------------|------------------|--------------------------|--------------------------|------------------|-----------------------------------|---------------|---------------------|----------------------|
| Risk Identification                                                |                     |                                                                     |                       | Quantitative Analysis    |             |                  |                          |                          |                  |                                   | CEVP Workshop |                     |                      |
|                                                                    |                     |                                                                     |                       | Post-Managed State       |             |                  |                          |                          |                  |                                   |               |                     |                      |
| ID #                                                               | Discipline Category | Risk Event Title                                                    | Threat or Opportunity | Direct Cost Impact (\$M) |             |                  | Schedule Impact (months) |                          |                  | Likelihood<br>of Impact Occurring | Disposition   | Impacted Activities | Bridge Span Scenario |
|                                                                    |                     |                                                                     |                       | Low<br>(10% CI)          | Most Likely | High<br>(90% CI) | Low<br>(10% CI)          | Most Likely <sup>3</sup> | High<br>(90% CI) |                                   |               |                     |                      |
| 420                                                                | Roadway Design      | Non-Approval of Assumed Design Deviations/ Exceptions: Movable Span | Threat                |                          |             |                  |                          |                          |                  |                                   | Minor         |                     | Movable Span         |
| 421                                                                | Structures          | Delayed decision on interstate bridge type                          |                       |                          |             |                  |                          |                          |                  |                                   | Minor         |                     | Both Fixed & Movable |
| 422                                                                | Roadway Design      | Contractor Innovation: River Bridge Movable Span                    | Opportunity           |                          |             |                  |                          |                          |                  |                                   | Minor         |                     | Movable Span         |