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Initial 2011 Financial Plan

SR 99 Alaskan Way Viaduct Replacement Project

(To be) August 2011

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Table of Contents

[Letter of Certification vi](#)

[1. Preface 1](#)

[2. Executive Summary 1](#)

[SR 99 Alaskan Way Viaduct Program 1](#)

[The Replacement Project 5](#)

[3. Context & Overview: The SR 99 Alaskan Way Program and Its Components 9](#)

[Background and History 9](#)

[Program Purpose and Need 12](#)

[Moving Forward Projects Summary and Status 12](#)

[Replacement Project 13](#)

[4. Replacement Project Initial Financial Plan 14](#)

[Requirements 14](#)

[Methodology 14](#)

[FHWA Financial Plan Review and Approval 15](#)

[Project Description 15](#)

[Bored Tunnel Design-Build 16](#)

[North Access 18](#)

[North Surface Streets 18](#)

[South Access 19](#)

[Battery Street Tunnel Decommissioning 20](#)

[Existing Viaduct Removal 21](#)

[Mercer Street West 21](#)

[Project Historical Timeline and Current Schedule 22](#)

[Federal NEPA Document and Decision Document 23](#)

[Tolling 23](#)

[Transportation Improvement Program \(TIP/STIP\) and Regional Transportation Plan 25](#)

[Public Outreach and Involvement 25](#)

[Transportation Demand Management \(TDM\) / Transit 26](#)

[FHWA Annual Update Requirements 26](#)

[Relationship of Financial Plan to Program/Project Management Plan 27](#)

<u>5. Implementation Plan</u>	<u>27</u>
<u>Management Tools to Monitor and Manage Risk</u>	<u>27</u>
<u>Project Delivery Methodology for the Alaskan Way Viaduct Replacement</u>	<u>28</u>
<u>WSDOT Delivery Methods</u>	<u>28</u>
<u>Project Specific Delivery Methods</u>	<u>29</u>
<u>Pre-Construction Requirements</u>	<u>29</u>
<u>Environmental Process and History</u>	<u>29</u>
<u>Environmental Approvals (Permits, Approvals, and Consultations)</u>	<u>31</u>
<u>Right of Way</u>	<u>32</u>
<u>6. Current Cost Estimate</u>	<u>33</u>
<u>Project Costs</u>	<u>33</u>
<u>WSDOT Cost Development and Risk Assessment</u>	<u>34</u>
<u>Construction Cost Inflation Factors / Escalation</u>	<u>34</u>
<u>Background & History</u>	<u>34</u>
<u>WSDOT's estimate basis for inflation rates are:</u>	<u>34</u>
<u>Escalation for the Alaskan Way Viaduct Program used the following method</u>	<u>34</u>
<u>Operating Period Costs</u>	<u>35</u>
<u>Cost Estimate by Construction Segment</u>	<u>35</u>
<u>Estimate by Major Project Element</u>	<u>36</u>
<u>Bored Tunnel Design-Build Contract</u>	<u>36</u>
<u>North Access, South Access & North Surface Streets Design-Bid-Build Contracts</u>	<u>37</u>
<u>7. Project Funding, Revenues, and Financing</u>	<u>38</u>
<u>State Funding — Transportation Partnership Account (TPA) and Nickel funds</u>	<u>38</u>
<u>Toll and Bond Authorization</u>	<u>39</u>
<u>Toll Authorization - State</u>	<u>39</u>
<u>Toll Authorization - Federal</u>	<u>40</u>
<u>Bond Authorization</u>	<u>40</u>
<u>Federal Funding</u>	<u>40</u>
<u>Advance Construction</u>	<u>41</u>
<u>City of Seattle Funds</u>	<u>41</u>
<u>Port of Seattle Funds</u>	<u>41</u>
<u>8. Cash Flow</u>	<u>42</u>
<u>Spending Cap Condition</u>	<u>42</u>

Contingency Fund 43

9. Risk Identification, Mitigation, and Other Factors 44

Risk Budgeting 46

Risk Monitoring 47

Incentives and Damages 48

10. Conclusions and Summary 49

Table of Figures

[Figure 1: Alaskan Way Viaduct 1](#)

[Figure 2: Alaskan Way Viaduct Vicinity Map 2](#)

[Figure 3: AWV Program Summary Timeline 3](#)

[Figure 4: Estimated Alaskan Way Viaduct Program Costs 4](#)

[Figure 5: Funding for the Alaskan Way Viaduct Replacement Program 5](#)

[Figure 6: Conceptual Bored Tunnel Cross-Section 6](#)

[Figure 7: Estimated Replacement Project Summary Costs 6](#)

[Figure 8: Replacement Project Funding 7](#)

[Figure 9: Alaskan Way Viaduct's south end section 9](#)

[Figure 10: AWV Program Summary Timeline 11](#)

[Figure 11: Components that Comprise the Replacement Project 14](#)

[Figure 12: Conceptual Bored Tunnel Cross-Section 16](#)

[Figure 13: North End Concept, including Tunnel Operations Building, 17](#)

[Figure 14: North Portal Design Concept 19](#)

[Figure 15: South Access Area of the Replacement Project 19](#)

[Figure 16: South Portal Design Concept 20](#)

[Figure 17: Battery Street Tunnel 21](#)

[Figure 18: Bored Tunnel Design-Build Contract Procurement Schedule 22](#)

[Figure 19: Right of Way \(ROW\) Certification Schedule 32](#)

[Figure 20: Estimated Replacement Project Summary Costs 33](#)

[Figure 21: Replacement Project Summary Cost Estimate by Segment 35](#)

[Figure 22: Bored Tunnel Contract Construction Phase Engineering Cost Estimate 36](#)

[Figure 23: Examples of Sources of Funds for the Replacement Project 38](#)

[Figure 24: Replacement Project Cash Flow by Source 42](#)

[Figure 25: Cap on Payments to the Design-Builder 43](#)

[Figure 26: Allocation of Risk/Inflation 46](#)

Appendices

	Appendix <u>Page</u>
A . Delegation of Authority for WSDOT Chief Financial Officer to Certify Financial Plans	1
B . WSDOT Secretary’s Executive Order E 1053.01, “Project Risk Management and Risk Based Estimating”, May 11, 2011.	3
C . WSDOT Project Delivery memo 07-01, “Project Cost Estimate Creation, Update, Review and Approval Procedures”, July 1, 2008.	8
D . WSDOT Secretary’s Executive Order E 1038.00, “Enterprise Risk Management”, September 4, 2007.	15
E . WSDOT Secretary’s Executive Order E 1032.01, “Project Management”, July 1, 2008.	19
F . WSDOT Secretary’s Executive Order E 1042.00, “Project Management and Reporting System (PMRS)”, July 1, 2008.	25
G . Instructional Letter Number, IL 4071.01, “Risk-Based Project Estimates for Inflation Rates, Market Conditions, and Percentile Selection”, May 7, 2010.	34
H . WSDOT <i>Cost Component Distribution Technical Memorandum</i> (CEVP® report), HDR, January 12, 2010	53
I . Updated SR 99 Alaskan Way Viaduct Replacement Updated Cost and Tolling Summary Report to the Washington State Legislature, January 2010.	71
J. WSDOT/FHWA Toll Agreement Documentation	115
K . “Alaskan Way Viaduct Replacement Project, 2010 Supplemental Draft Environmental Impact Statement and Draft Section 4(f) Evaluation, Section 6, Construction Mitigation,” (FHWA9WA9EIS9049019DS2), September 24, 2010, pages 154-159.	126

L	WSDOT’s Interpretation of 2011 – 13 Legislatively Approved Budget for AWW . Program, May 2, 2011, (11DOTLFC from TEIS)	133
M	Letter commemorating conditional approval for construction of Bored Tunnel from . Puget Sound Regional Council, June 23, 2011.	150
N	Summary of WSDOT Design-Build Methodology .	152
O	Summary of WSDOT Design-Bid-Build Methodology .	154
	Memorandum of Agreement, funding commitment between WSDOT and Port of Seattle (GCA 6444)	
P.		156

Letter of Certification

The Washington State Department of Transportation (WSDOT) has developed an Initial Financial Plan for the *SR 99 Alaskan Way Viaduct Replacement Project* (Replacement Project). The plan is in accordance with the requirements of US Code Section 106, Title 23, and the Financial Plan guidance issued by the Federal Highway Administration.

The cost data in the Initial Financial Plan provides an accurate accounting of costs incurred to date and includes a realistic estimate of future costs based on engineers' estimates, currently planned activities, and expected construction cost escalation factors.

The Replacement Project contains a mix of funding that includes direct sources, as well as toll revenues. While the estimates of financial resources rely upon assumptions regarding future economic conditions and demographic variables, they represent realistic estimates of available monies to fully fund the Replacement Project.

We believe the Initial Financial Plan provides an accurate basis upon which to schedule and fund the Replacement Project.

To the best of WSDOT's knowledge and belief, the Initial Financial Plan, fairly and accurately presents the financial position of the Replacement Project, cash flows and expected conditions for design and construction of the project. The financial forecasts in this Initial Financial Plan are based on our judgment of the expected project conditions and our expected course of action. We believe that the assumptions underlying the Initial Financial Plan are reasonable and appropriate. Further, we have made available all significant information that we believe is relevant to the Initial Financial Plan and to the best of our knowledge and belief, the documents and records supporting the assumptions are appropriate.

Amy Arnis Date
Chief Financial Officer
Assistant Secretary, Strategic Planning and Finance
Washington State Department of Transportation

1. Preface

This document is the Initial Financial Plan for the *State Route (SR) 99 Alaskan Way Viaduct Replacement Project* (Replacement Project), which is part of a larger *SR 99 Alaskan Way*

Viaduct Replacement Program (AWV Program), located in downtown Seattle in Washington State. This project level financial plan is required by the Federal Highway Administration (FHWA) because the total project size, including design, right of way, and construction exceeds \$500 million and Washington State Department of Transportation (WSDOT) anticipates using future federal funds.

Given the integrated nature of individual projects within the SR 99 Alaskan Way Viaduct Replacement Program (AWV Program), this financial plan will begin by providing a program overview in Section 3. Sections 4 through 10 will then focus specifically on the scope, schedule, costs, and funding for the Replacement Project.

Figure 1: Alaskan Way Viaduct

2. Executive Summary

SR 99 Alaskan Way Viaduct Program

Built in the 1950s, the Alaskan Way Viaduct is a north-south National Highway System freeway that carries more than 110,000 vehicles per day through downtown Seattle, Washington. In 2001 a 6.8 magnitude Nisqually earthquake damaged the Alaskan Way Viaduct and forced the Viaduct to be closed for emergency repairs.

The Alaskan Way Viaduct is seismically vulnerable and at the end of its useful life. To protect public safety and provide essential vehicle capacity to and through downtown Seattle, the Viaduct must be replaced. Because this facility is at risk of sudden and catastrophic failure in an earthquake, FHWA, WSDOT, and the city of Seattle seek to implement a replacement as soon as possible. Moving people and goods to and through downtown Seattle is vital to maintaining local, regional, and statewide economic health.

As part of the studies to evaluate various solutions for the Viaduct, FHWA, WSDOT, and the city of Seattle have identified the following purposes and needs that the solutions should address. The purpose of the proposed action is to provide a replacement transportation facility that will:

- Reduce the risk of catastrophic failure in an earthquake by providing a facility that meets current seismic safety standards.

- Improve traffic safety.

- Provide capacity for automobiles, freight, and transit to efficiently move people and goods to and through downtown Seattle.

- Provide linkages to the regional transportation system and to and from downtown Seattle and the local street system.

- Avoid major disruption of traffic patterns due to loss of capacity on SR 99.

- Protect the integrity and viability of adjacent activities on the central waterfront and in downtown Seattle.

WSDOT has evaluated several options for replacing the Viaduct since the 2001 Nisqually Earthquake. In 2006, Governor Christine Gregoire called for an advisory vote to be held in

Seattle to determine the preferred alternative. The March 2007 ballot included an elevated alternative and a surface-tunnel hybrid alternative. The citizens voted down both alternatives.

After the March 2007 vote in Seattle, Governor Gregoire, King County Executive Ron Sims and Seattle Mayor Greg Nickels chose to “move forward” with critical safety and mobility improvement projects and replace the south end of the Alaskan Way Viaduct between South Holgate and South King streets. These Moving Forward Projects could proceed while the executives worked together through a collaborative public process to develop a replacement solution for the Viaduct’s central waterfront section between South King Street and Battery Street, which will have broad consensus among the lead agencies, cooperating agencies, tribes and the public.

Figure 2: Alaskan Way Viaduct Vicinity Map

Replacement Project general area – including the central waterfront

Holgate to King Area

In January 2009, the Governor, County Executive and Mayor recommended replacing the central waterfront portion of the Alaskan Way Viaduct with a deep single-bore tunnel. In addition, they recommended replacing the associated surface street, Alaskan Way, with a new waterfront surface street and promenade, transit investments, a streetcar on First Avenue, a restored seawall and downtown city street improvements. Their recommendation was based on the potential for a bored tunnel and other improvements to meet the six guiding principles established as part of the Partnership Process; technical analysis; strong support of diverse interests; and the willingness of the partners, with the support of the Port of Seattle, to develop a funding program that supplements the State’s committed \$2.8 billion. In fall 2009, the city of Seattle and the State executed a policy agreement formally aligning policies through ordinance with their action earlier in January. This agreement was further supported by an agreement between the city of Seattle and the State clarifying administrative procedures and practices for implementation of the preferred alternative.

The State’s Alaskan Way Viaduct Program (AWV Program) is comprised of several distinct efforts:

Moving Forward Projects,

Replacement Project,

- a. Central Waterfront (including the Bored Tunnel),
- b. North and south accesses,
- c. Surface Street Restoration – Battery Street Tunnel, Viaduct Decommissioning Components),
- d. Construction Mitigation,

Other Surface Street Restoration components, and

Program Management.

Work within the AWV Program started in 2007 with safety repairs on columns between Columbia and Yesler Streets, followed by advance utility work. Much of the Program’s heavy construction will occur between 2010 and 2016 with construction in the south end on the Holgate

to King Project and bored tunnel to replace the central and northern portions of the Viaduct. Construction and demolition work for the Replacement Project is anticipated to be completed by 2016.

Figure 3: AWV Program Summary Timeline

The State's total AWV Program cost is approximately \$3.15 billion, with the Replacement Project making up the largest effort within the Program. Figure 4 outlines estimated AWV Program costs. As seen in the call-out boxes, separating the items belonging to separate projects and lead agencies is sometimes a challenge in this overview due to the weave of environmental documentation, funding, and contracting structures that make up the AWV Program.

Figure 4: Estimated Alaskan Way Viaduct Program Costs

(Year of Expenditure, Millions of Dollars)

Replacement Project Components include:

\$2,010.7 M for Central Waterfront, \$50 M for the Battery Street Decommissioning and Viaduct Removal, and \$100 M for city of Seattle Mercer St. West (not featured in this figure, See Fig. 6), for a total of \$2,160.7 M.

The Replacement Project EIS only included \$50 M in scope for the Battery Street Decommissioning and Viaduct Removal. The remainder of the Surface Street Restoration scope will be covered in a separate environmental document.

Source: WSDOT Cost Estimate to support WA State Legislature approved 2011-13 budget, 11LEGFIN

(1) Construction mitigation funds were established to offset the loss of short term parking under the existing viaduct.

The funding plan for the AWV Program is made up a variety of sources including Washington State transportation funding, federal SAFETEA-LU funding, and local funding contributions

from the city of Seattle, Port of Seattle, and toll funding. The total amounts of each specific funding source are detailed in [Figure 5](#).

Figure 5: Funding for the Alaskan Way Viaduct Replacement Program

(Year of Expenditure, Millions of Dollars)

Source: WA State Legislature approved 2011-13 budget, 11LEGFIN

1. *Local Funds include re-imbursement from the city of Seattle for utility relocation work to be performed by the project's design-builder.*
2. *Use of this funding is dependent on a future federal authorization act. If this funding is not found to be applicable, WSDOT will use other eligible federal funds available.*

With the work that WSDOT conducted in 2010, WSDOT identified all of the funding to complete the entire \$3.15 billion Alaskan Way Viaduct Program. The program will use \$2.75 billion in funding from state, federal, local, and Port of Seattle sources as means for financing all phases of work. The plan assumes tolling will provide up to \$400 million.

The Replacement Project

The Replacement Project, located in the middle and north end of the AWW Program area (Figure 2) will build a bored tunnel ([Figure 6](#)), provide north and south access portals, demolish the old viaduct structure that the tunnel will replace, and decommission the Battery Street Tunnel that connects SR 99 to the current viaduct structure on the north end. The Replacement Project is anticipated to be comprised of up to seven separate construction contracts.

The Replacement Project includes what many now refer to as “the Central Waterfront” at \$2.01 billion, in addition to other components of the environmental impact statement (EIS). When all the components of the EIS are included, the total project cost and funding for the Replacement Project is estimated at \$2.16 billion ([Figure 7](#) and [Figure 8](#)).

Figure 6: Conceptual Bored Tunnel Cross-Section

Figure 7: Estimated Replacement Project Summary Costs

(\$ in millions, year of expenditure)

Source: WSDOT Cost Estimate to support WA State Legislature approved 2011-13 budget, 11LEGFIN

1. *Viaduct Demolition and Battery Street Tunnel decommissioning are a subset of the \$290 million Surface Street Restoration effort. The figures shown here are preliminary estimates that will be refined in subsequent financial plans.*
2. *The Mercer Street West component, work to be performed by the city of Seattle, has been included in this report because it is also cleared by the EIS.*

The Replacement Project will use \$2.16 billion in funding from state, federal, local, and Port of Seattle sources. Of the \$2.16 billion, up to \$400 million will come from bonds that will be paid back by tolling the Bored Tunnel.

Figure 8: Replacement Project Funding

(Year of expenditure, dollars in millions)

Source: WA State Legislature approved 2011-13 budget, 11LEGFIN

(1) Local funding includes \$50 million in reimbursements from the city of Seattle for utilities work performed by the project's design-builder.

(2) This component covers two elements covered by the EIS – existing viaduct demolition and Battery Street Tunnel decommission.

(3) The Mercer Street West component, work to be performed by the city of Seattle, has been included in this report because it is also cleared by the EIS.

(4) Use of this funding is dependent on a future federal authorization act. If this funding is not found to be applicable, WSDOT will use other eligible federal funds available.

WSDOT has been studying various options for toll methods and rates. Early studies evaluated a range of toll rates for passenger vehicle depending on direction of travel and time of day (Appendix I). Recent study has been targeted toward a \$2.75 to \$3.50 toll per passenger vehicle for the peak period direction in 2008 dollars.¹

Traffic diversion is a point of interest as well, with more evaluation to come. Additional study and refinement of toll options will be developed prior to anticipated tolling in 2016 when the tunnel is scheduled to open.

Construction on the Replacement Project will be comprised on multiple components and is anticipated to start with authorization to the Bored Tunnel design-builder (Seattle Tunnel Partners) in fall 2011. The tunnel is scheduled to open in 2016, with the Project winding down with final demolition of the old structures (Viaduct and Battery Street Tunnel) in 2017 and 2018.

Acknowledging that large projects can be risky, WSDOT has engaged in a variety of efforts, studies, and processes to minimize, account for, manage, and track risks that may affect project scope and schedule. See Section 9 for more detail.

As the body of this document demonstrates (sections 4 through 10), WSDOT is confident that the financial commitments for the Replacement Project are sufficient and that efforts to manage scope and schedule risks that affect cost and traffic movement in the city of Seattle will be adequately implemented.

3. Context & Overview: The SR 99 Alaskan Way Program and Its Components

This section of the initial finance plan discusses the background and history of the Alaskan Way Viaduct, and describes the Alaskan Way Viaduct Replacement Program and its component projects.

Background and History

Figure 9: Alaskan Way Viaduct's south end section

The Alaskan Way Viaduct section of SR 99 has been a fixture of the downtown Seattle waterfront for over five decades. Today, SR 99 continues to be a main north-south route through the city, carrying one quarter of all north-south traffic (110,000 vehicles) through Seattle every day. However, its days are numbered. Time, daily wear and tear, salty marine air and some sizeable earthquakes have taken their toll on the structure.

Built in the 1950s, the Alaskan Way Viaduct is nearing the end of its useful life and does not meet today's seismic design standards. The soils around the foundations of the structure consist of former tidal flats covered with wet, loose fill material subject to liquefaction. The Alaskan Way Seawall, which is also vulnerable to earthquakes, holds these soils in place along the majority of the viaduct corridor. Built in the 1930s, the Alaskan Way Seawall is in a state of disrepair and continuing deterioration. It also does not meet current seismic design standards.

In early 2001, a team of Washington State Department of Transportation (WSDOT) design and seismic experts began work to determine whether it was feasible and cost-effective to strengthen the Viaduct by retrofitting it. In the midst of this investigation, the 6.8 magnitude Nisqually earthquake shook the Puget Sound region. The earthquake damaged the Viaduct, forcing WSDOT to temporarily shut it down for emergency repairs.

Closure of the Viaduct following the 2001 Nisqually Earthquake resulted in extreme congestion on Interstate 5 (I-5) and in the downtown city street grid. The closure demonstrated that SR 99 through Seattle is a critical transportation link that needs to remain functional. WSDOT estimates that if the Viaduct is no longer usable, travel time through the downtown Seattle area will double.

Ongoing inspections have revealed the Viaduct has moved and settled, and the seawall's timber relieving platform has been eaten away by tiny marine crustaceans called gribbles. The Nisqually earthquake highlighted the fact that the viaduct and seawall are nearing the end of their useful lives, and it is time to replace them.

The *2006 Supplemental Draft Environmental Impact Statement (SDEIS)* analyzed two alternatives—a refined cut-and-cover “Tunnel Alternative” and a modified rebuild alternative called the “Elevated Structure Alternative.” Since 2006, additional study and evaluation of other alternatives have taken place.

After continued public and agency debate over the alternatives included in the 2006 SDEIS, Governor Christine Gregoire called for an advisory vote to be held in the city of Seattle. The March 2007 ballot included an elevated alternative and a surface-tunnel hybrid alternative. The citizens voted against both alternatives.

After the March 2007 Seattle vote, Governor Gregoire, King County Executive Ron Sims, and city of Seattle Mayor Greg Nickels chose to “move forward” with critical safety and mobility improvement projects at the north and south ends of the Alaskan Way Viaduct, which included replacing the structure's southern mile. These Moving Forward Projects could proceed while the executives worked together through a collaborative public process to develop a replacement

solution for the Viaduct' central waterfront section that will have broad consensus among the lead agencies, cooperating agencies, tribes and the public.

The Moving Forward Projects included:

Column safety repairs on the existing viaduct in the Pioneer Square area;

Electrical line relocation along the Viaduct's South End;

Replacement of the viaduct (SR 99) between South Holgate Street and South King Street in the South End;

Battery Street Tunnel maintenance and repairs; and

Transit enhancements and other improvements.

In December 2007, Governor Gregoire, King County Executive Sims, and Seattle Mayor Nickels committed to a collaborative effort, called the Partnership Process, to forge a solution for the viaduct's central waterfront section that could be broadly supported and implemented. The Partnership Process included input from a 29-member Stakeholder Advisory Committee and Project Management Team.

After examining numerous below-ground, surface and above-ground options, WSDOT, King County, and the city of Seattle released the I-5/surface/transit hybrid alternative and elevated bypass hybrid alternative in December 2008 for public comment. These hybrids were selected because they were the lower cost options and provided mobility for people and goods, although in different ways. Based on support from the Stakeholder Advisory Committee and public for the bored tunnel option, the Governor, County Executive, and Mayor asked their departments of transportation to complete further analysis of it.

In January 2009, the Governor, County Executive, and Mayor recommended replacing the central waterfront portion of the Alaskan Way Viaduct with a single large-diameter bored tunnel. The recommendation also included a new waterfront surface street and promenade, transit investments, a streetcar on First Avenue, a restored seawall and downtown city street improvements. Their recommendation was grounded in the potential for a bored tunnel and other improvements to meet the six guiding principles established as part of the Partnership Process; technical analysis; strong support of diverse interests; and the willingness of the partners, with the support of the Port of Seattle, to develop a funding program that supplements the State's committed \$2.8 billion. In fall 2009, the city of Seattle and the State executed a policy agreement formally aligning policies through ordinance with their action earlier in January. This agreement was further supported by an agreement between the city of Seattle and the State clarifying administrative procedures and practices for implementation of the preferred alternative.

In September 2009, the *Alaskan Way Viaduct Replacement Project History Report* was prepared to summarize the alternatives that have been studied since the program began in 2001 and to focus on the evaluation of alternatives through the Partnership Process and how the Bored Tunnel Alternative emerged. A copy of this report is included in the 2010 updated Project Management Plan.

In addition to the bored tunnel, WSDOT is the lead for removing the existing viaduct structure, decommissioning the Battery Street Tunnel and completing the Moving Forward Projects. King

County is the lead for RapidRide enhancements, additional peak hour bus service and transit speed and reliability improvements. The city of Seattle is the lead for the utility relocations, the waterfront promenade, city street improvements and the First Avenue Streetcar. The City is also responsible for replacing the seawall and will lead independent environmental evaluations for most of the City efforts. A timeline for the AWV Program is shown in Figure 10.

Figure 10: AWV Program Summary Timeline

Program Purpose and Need

The Alaskan Way Viaduct is seismically vulnerable and at the end of its useful life. To protect public safety and provide essential vehicle capacity to and through downtown Seattle, the Viaduct must be replaced. Because this facility is at risk of sudden and catastrophic failure in an earthquake, FHWA, WSDOT, and the city of Seattle seek to implement a replacement as soon as possible. Moving people and goods through downtown Seattle is vital to maintaining local, regional, and statewide economic health. FHWA, WSDOT, and the city of Seattle have identified the following purposes and needs that the Project should address.

The purpose of the proposed action is to provide a replacement transportation facility that addresses the following needs:

- Reduce the risk of catastrophic failure in an earthquake by providing a facility that meets current seismic safety standards;
- Improve traffic safety;
- Provide capacity for automobiles, freight, and transit to efficiently move people and goods to and through downtown Seattle;

Provide linkages to the regional transportation system and to and from downtown Seattle and the local street system;

Avoid major disruption of traffic patterns due to loss of capacity on SR 99; and

Protect the integrity and viability of adjacent activities on the central waterfront and in downtown Seattle.

Moving Forward Projects Summary and Status

Column safety repairs on the existing viaduct in the Pioneer Square area between Columbia Street and Yesler Way were completed in April 2008. The Electrical Line Relocation Phase 1 construction contract along the viaduct's South End was completed in December 2009. The Transit Enhancements and other improvements projects were established to mitigate traffic during construction of the Holgate to King Project as well as the Central Waterfront Traffic. These projects were managed by WSDOT, the city of Seattle, and King County. All of the projects are near completion and are functionally operational. These projects are shown in Figure 10.

The only "Major Project" (over \$100 million) included in the Moving Forward Projects is the South End viaduct replacement between South Holgate Street and South King Street. The environmental assessment for Holgate to King was released in June 2008, and the Finding of No Significant Impact (FONSI) was signed by FHWA in February 2009.

A separate *Project Management Plan* and an *Initial Financial Plan* was prepared for Holgate to King Project. The *Initial Financial Plan* was approved by FHWA in June 2009. The first Annual Update was submitted to FHWA on December 1, 2010. However, because the total project cost fell substantially below \$500 million, but is still higher than \$100 million, WSDOT will continue to develop Annual Updates, but they do not need to be approved by FHWA.

The Stage 1 construction contract to relocate utilities was substantially complete on May 28, 2010. The Stage 2 Heavy Civil Construction contract was also awarded in May 2010 and construction is scheduled to be completed by mid-2013. The Stage 3, South Atlantic Street Bypass is still in preliminary engineering, and Stage 4, Landscaping and Completion Work is still under development. The Holgate to King Project will complete the South End of the viaduct replacement.

Replacement Project

The Replacement Project is located in the middle and north end of the AWV Program area ([Figure 11](#)) and may be comprised of approximately seven components.

1. Bored Tunnel Design-Build
2. North Access
3. North Surface Streets
4. South Access
5. Viaduct demolition
6. Battery Street Tunnel decommissioning

7. Mercer Street West (city of Seattle project)

The Replacement Project is the focus of this Initial Financial Plan and described fully in Section 4.

Figure 11: Components that Comprise the Replacement Project

4. Replacement Project Initial Financial Plan

Starting with Section 4 and extending for the rest of this document, this is the Initial Financial Plan for the Replacement Project. The purpose of the Initial Financial Plan is to provide a comprehensive document that reports the Replacement Project's cost estimate and revenue structure and to provide a reasonable assurance that there will be sufficient financial resources available to implement and complete the Project as planned.

This Initial Financial Plan will describe Replacement Project:

- Cost estimates
- Delivery schedule
- Funding, revenues, and financing
- Projected cash flow needs
- Risk/mitigation management measures

Requirements

The requirement for Major Project financial plans was established in 2005. Section 1904(a)(2) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy For Users (SAFETEA-LU) amended 23USC106(h). SAFETEA-LU identified that projects over \$500 million in total project cost shall develop financial plans and submit them for approval to the Federal Highway Administration. Requirements are spelled out in the *FHWA Financial Plan Guidance, January 2007*.

Methodology

The Initial Financial Plan for the Replacement Project was prepared in accordance with the Financial Plans Guidelines established by the Federal Highway Administration (FHWA). The Financial Plans Guidance presents an outline for the “Initial Financial Plan” and for “Annual Updates.” SAFETEA-LU requires that the Initial Financial Plan be based on detailed annual estimates of the cost to complete the remaining elements of the project and on reasonable assumptions of future increases in the cost to complete the project. The Initial Financial Plan provides information on the immediate and longer-term financial implications at the time of project initiation. The annual updates of the Initial Financial Plan will provide information on actual expenditures in comparison to initial estimates, as well as updated estimates of future year's obligations and expenditures.

Based on the need to replace the Viaduct as quickly as possible and reduce impacts during construction, the State proceeded with issuing a design-build contract in advance of the Record of Decision (ROD). The contract was awarded with a limited Notice to Proceed (NTP #1), which restricted work progress to producing preliminary engineering in support of the Final

Environmental Impact Statement (FEIS) only. The full terms of the contract, including final design and construction, through a Notice to Proceed Number 2 (NTP #2) will take effect immediately after the ROD is issued, this Initial Financial Plan is approved, and federal funding authorization is granted.

With the contractor Notice to Proceed split into two stages and with an expedited schedule supplied by the Design-Build contractor to remove the existing viaduct, WSDOT committed to a few key points with FHWA.

1. In the timeframe between the award of the contract in January 2011 and completion of the EIS in July 2011 and Initial Financial Plan in August 2011, the Design-Builder will not engage in any activities beyond preliminary design (23 CFR 636.109) development to support the EIS and efforts to support that preliminary design.
2. The Design-Builder may start construction related activities only upon issuance by FHWA of the ROD, FHWA acceptance of the Initial Financial Plan, and approval of federal funding authorization.

FHWA Financial Plan Review and Approval

The Replacement Project is over \$500 million in total project cost, this Initial Financial Plan and each annual update will be submitted to the FHWA Washington State Division Office for review and approval. The Division Office will coordinate with the FHWA headquarters Major Projects Team for review and concurrence. Review will include such items as the reasonableness of the cost projections, the viability of the identified funding sources including whether they are contained in the fiscally constrained Statewide Transportation Improvement Program (STIP)/Transportation Improvement Plan (TIP)/Long Range Plan, and the likelihood that the funding commitments will provide sufficient resources to complete the Project as planned. The FHWA review and a determination of acceptability are anticipated to be done within 30 to 60 days from the date that the document is received by the FHWA Division Office.

Project Description

The Replacement Project may be comprised of approximately seven components that will connect with the other projects within the AWW Program described in Section 3 to form a connected roadway system through downtown Seattle, Washington. The seven components include:

1. Bored Tunnel Design-Build
2. North Portal/Access
3. North Surface Streets
4. South Portal/Access
5. Viaduct demolition
6. Battery Street Tunnel decommissioning
7. Mercer Street West (this component to be funded and overseen by city of Seattle)

The Replacement Project has finalized its scope of work through the completion of its FEIS in July 2011. The bored tunnel will replace SR 99 between South Royal Brougham Way and Roy Street. The tunnel will have two lanes in each direction. Access to and from the tunnel will be provided via ramp connections at the southern end, located north of South Royal Brougham Way and the north portal near Harrison Street. Different from the existing structure, mid-town ramps were not considered for the bored tunnel alternative. In addition, the Project includes removal of the Viaduct along the Seattle waterfront and decommissioning of the Battery Street Tunnel after the bored tunnel is constructed and open to traffic.

Bored Tunnel Design-Build

This single contract Design-Build (D-B) procurement effort will consist of cut and cover structures at the north and south portals, a large diameter (interior diameter 51'-0") bored tunnel, an interior concrete structure with stacked roadways for north and southbound traffic, tunnel operations buildings, and tunnel systems. The southern limit of the civil work will match with Contract SA (South Access) on SR 99 near South Royal Brougham Way, and the northern limit of the civil work will match with Contract NA (North Access) east of 6th Avenue near Harrison Street.

The bored tunnel will have two lanes in each direction. Southbound lanes will be located on the top portion of the tunnel, and the northbound lanes will be located on the bottom ([Figure 12](#)). The basic configuration for the design build contract requires a minimum 30-foot roadway width and a minimum vertical clearance of 15 feet within the traveled way. Travel lanes will be 11 feet wide, with a 2-foot-wide shoulder on the east side and an 8-foot-wide shoulder on west side. The wider shoulder will provide emergency vehicle access and space for disabled vehicles to safely stop.

Figure 12: Conceptual Bored Tunnel Cross-Section

The wider shoulder will also provide access to emergency tunnel exits, which will be provided at least every 650 feet. In an emergency, travelers will walk along the shoulders to reach a doorway which leads into a secure waiting area called a refuge area. Staircases inside the refuge area will provide access between the roadway levels. Signs will point travelers to the nearest exit where they would either wait for assistance or walk out of the tunnel. Refuge areas will contain emergency telephones.

The tunnel will be equipped with ventilation, a fire detection/suppression system, and drainage. Video cameras will provide real-time information to the operators at WSDOT's 24-hour tunnel control center and allow them to respond quickly to changing conditions and emergencies. The main tunnel control/operations center will be located with WSDOT's Northwest Region Traffic Management Center. The back-up tunnel control/operations center will be incorporated into one of the tunnel ventilation buildings at the north tunnel portal between Thomas and Harrison Streets on the east side of Sixth Avenue North.

Figure 13: North End Concept, including Tunnel Operations Building, North Portal, North Access, and Mercer Street

North Access

This Design-Bid-Build Contract constructs the SR 99 mainline and ramps starting at the North Tunnel Portal area in the vicinity of Harrison Street and extends north to where it joins Aurora Avenue at Mercer Street. This contract also includes on and off ramps in the vicinity of Republican Street that connect the mainline to the City streets and an extension of 6th Avenue from Harrison Street to Mercer Street. Other items of work include stormwater controls, ITS, signing, structures, retaining walls, traffic control, and roadside restoration. The installation of the advance signing and ITS extends north of Mercer Street.

Utility conflicts not associated with the north tunnel operations building and north cut and cover activities will be incorporated in to the North Access design and construction. Relocation of utilities will be funded by the city of Seattle or private utility providers.

The depressed to at-grade roadway extending north from the tunnel portal at Harrison Street to the existing alignment of Aurora Avenue North will comprise the bulk of the North Access contract. There will also be surface roadway modifications to work with the new on- and off-ramps leading to and from the tunnel that connects to 6th Avenue and Republican Street as well the mainline merge with Aurora Avenue North.

At the north portal area, Sixth Avenue North will be extended from Harrison Street to Mercer Street. The new on-ramp to southbound SR 99 will intersect with the new Sixth Avenue North alignment midway between Harrison Street and Mercer Street. The new off-ramp from northbound SR 99 will connect to the intersection of Republican Street and Dexter Avenue. Northbound on- and southbound off-ramps to and from the intersection of Aurora Avenue and Harrison Street will also be constructed.

North Surface Streets

This Design-Bid-Build contract includes roadway work at the conclusion of the construction of the main roadway. This contract includes the reconstruction of 6th Avenue and Harrison Street over the north portal cut and cover constructed in Contract TU, backfilling the north portal of the Battery Street Tunnel, reconnecting John, Thomas, and Harrison Streets across Aurora Avenue North, improvements to the Aurora Avenue surface street between Denny Way and Harrison Street, and completes minor restoration work, landscaping and sidewalks.

**Figure 14: North Portal Design Concept
(also showing part of North Access and Mercer)**

South Access

This Design-Bid-Build contract provides the permanent connection of Southbound SR 99 from the U-Section of the bored tunnel, on Alaskan Way in the vicinity of South Royal Brougham Way, to the Holgate to King Project, south of Royal Brougham Way. The South Access contract will construct the southerly 600 feet of the southbound off-ramp to the South Royal Brougham Way intersection. This contract will also construct the southbound on-ramp and the northbound off-ramp, which will include a bridge over the bored tunnel southbound off- / northbound on-ramp construction.

Figure 15: South Access Area of the Replacement Project

Vicinity of the South Access

This contract will remove the residual portions of the WOSCA detour not reconfigured and removed by the Bored Tunnel Design-Builder, and provide the permanent connection from SR 99 to the southern end of the tunnel.

This contract includes the reconstruction of surface streets at both the Royal Brougham Way and Dearborn Street ramp terminals, and over the south portal cut and cover constructed by the Bored Tunnel Contractor. The surface street reconstruction includes Alaskan Way Boulevard, Dearborn Street, 1st Avenue South after removal of the WOSCA detour structures, and the East Frontage Road. This portion of the Replacement Project will construct the South Operations Building parking structure. It will also complete stormwater control, ITS, signing, structures, retaining walls, traffic control, and roadside restoration.

Figure 16: South Portal Design Concept

Battery Street Tunnel Decommissioning

The Battery Street Tunnel connects the existing SR 99 / Aurora Boulevard in the north end of downtown Seattle to the existing Alaskan Way Viaduct structure.

The Battery Street Tunnel will be decommissioned and closed after the bored tunnel is open to traffic. As part of the Battery Street Tunnel decommissioning process, the tunnel may require remediation to remove soot containing high levels of lead and to remove asbestos within the

Figure 17: Battery Street Tunnel

tunnel. Decommissioning will also include disconnecting power, water, and drainage lines. The necessary utilities that run through the tunnel will be relocated, and materials such as lighting fixtures will be removed. Then the tunnel will be filled with suitable material (such as the concrete rubble from viaduct demolition), and all street access vents and both portals will be sealed. The rubble will be solidified with a concrete mix. The Battery Street Tunnel portals will be sealed with concrete and barricaded.

Existing Viaduct Removal

Demolition of the existing central and northern portions of the Alaskan Way Viaduct from just south of South King Street to the Battery Street Tunnel will start after the bored tunnel is open to traffic in 2016. The removal process is anticipated to take nine months.

Viaduct demolition will generate approximately 107,000 cubic yards of material, primarily broken concrete and reinforcing steel that will need to be hauled away and disposed of. Utilities attached to the viaduct will be relocated before the viaduct is demolished. Utilities will be relocated underground, which will require excavation under the existing viaduct.

Most utilities buried beneath the viaduct are not expected to be affected by viaduct demolition or removal of the viaduct columns to a depth of 5 feet below the existing grade. Soil disturbances more than five feet below the existing grade have the potential to disturb deeper utilities. Mitigation measures, such as timber mats or gravel beds, will be used to ensure that utilities buried beneath the viaduct will not be damaged during viaduct demolition.

Mercer Street West

The Mercer West Project includes improvements on Mercer Street between Fifth Avenue North and Elliott Avenue West. The improvements include reconfiguring Mercer and Roy Streets west of Fifth Avenue North to accommodate two-way traffic. Mercer Street will become a two-way street and will be widened from Ninth Avenue North to Fifth Avenue North. The rebuilt Mercer Street will have three lanes in each direction with left-hand turn pockets. Broad Street will be filled and closed between Ninth Avenue North and Taylor Avenue North.

The proposed improvements will improve access from SR 99 for drivers traveling to Uptown (Lower Queen Anne), Ballard, Interbay, and Magnolia neighborhoods. Although this component is under the EIS for the Replacement Project, it will be administered and funded by the city of Seattle as part of a larger package of surface street improvements.

Project Historical Timeline and Current Schedule

In response to several large earthquakes in other parts of the world, WSDOT began to study the viaduct in the mid-1990s. These studies showed that the 1950s-era viaduct was vulnerable to earthquakes and nearing the end of its useful life. In early 2001, a team of structural design and seismic experts began work to determine what to do about the viaduct. In the midst of this investigation, the 6.8-magnitude Nisqually earthquake shook the Puget Sound region on February 28, 2001.

In 2002 conceptual engineering for the replacement of the Viaduct began. Between 2002 and 2006, the numbers of alternatives were reduced from 176 down to a cut-and-cover tunnel and elevated structure alternative. In July 2011 the Alaskan Way Viaduct Program selected the preferred alternative for the replacement of the Central Waterfront section with a bored tunnel as part of the Replacement Project.

The Replacement Project remains in the preliminary engineering phase until the ROD is anticipated to be signed by FHWA in August 2011.

[Figure 18](#) highlights important decisions and construction activity regarding the Bored Tunnel Design-Build Contract.

Figure 18: Bored Tunnel Design-Build Contract Procurement Schedule

Action	Dates
Request for Qualifications (RFQ) Issue Date	September 15, 2009
RFQ Voluntary Meeting	October 7, 2009
SOQ Due Date Proposers	November 16, 2009
Voluntary Proposers Meetings	March 1-September 15,

	2010
Issue Final RFP	May 26, 2010
ATC Submittal Deadline	August 31, 2010
Deadline for Submitting Proposer's Questions	September 15, 2010
Deadline for WSDOT's Response to Proposer's Questions	September 30, 2010
Proposals Date	October 28, 2010
WSDOT Requests for Information (RFIs) to Proposers	November 12, 2010
Proposer Presentations	November 15-19, 2010
Announce Apparent Best Value Proposer	December 9, 2010
Contract Award Date	January 6, 2011
1 st Notice to Proceed (NTP 1) (start design-build contract, allowed planning and preliminary engineering only)	February 7, 2011
Anticipated FHWA Signed Record of Decision (ROD)	August 15, 2011
Puget Sound Regional Council (PSRC) Concurrence	August 15, 2011 (est.)
2 nd Notice to Proceed (NTP # 2) (Begin Construction)	August 17, 2011
Substantial Completion	December 2015
Facility Open to Traffic	January 2016

Federal NEPA Document and Decision Document

In compliance with the National Environmental Policy Act (NEPA), the Project filed a Notice of Intent (NOI) for studying the replacement in the Federal Register in July 2001. Preliminary engineering and the environmental process began soon after that time. The *Alaskan Way Viaduct and Seawall Replacement Project Draft Environmental Impact Statement* (Draft EIS) was signed by the lead agencies that included FHWA, WSDOT and the city of Seattle in March 2004.

The environmental review process for the Bored Tunnel Alternative built on the five alternatives evaluated in the 2004 Draft EIS and cut-and-cover tunnel and elevated structure alternatives in the 2006 SDEIS. In June 2009, an updated NOI was published informing the public that an additional SDEIS would be prepared to evaluate the bored tunnel alternative as the recommended solution from the Partnership Process for replacing the viaduct along the Seattle waterfront.

The SDEIS for the Bored Tunnel Alternative was published for public review in October 2010. After publication and the opportunity for the public, agencies and tribes to comment on the 2010 SDEIS, FHWA, WSDOT and the city of Seattle prepared and published the Final EIS in July 2011. FHWA is anticipated to issue a ROD in August 2011, which is the NEPA decision document for the Replacement Project.

Tolling

The Washington State Legislature has identified that tolling can “provide a source of transportation funding and to encourage effective use of the transportation system”.² In this dual role, it can be a means of revenue generation, it can be part of a facility-specific or regional demand management program, or it can be used for a combination of both. The implementation strategy, toll rates, variability of toll rates, and locations of collection (e.g., mainline only or mainline and ramps) depend on the ultimate purpose of the tolling. In the case of the Replacement Project, tolling will be implemented to both manage traffic and generate revenue. The location of electronic toll collection equipment is anticipated to be on the north end of the project area.

Most tolling projects in the state of Washington have been implemented in locations where there were very few, if any, alternate routes. The Hood Canal Bridge, Tacoma Narrows Bridge, and the SR 520 Bridge are examples of facilities that have been tolled where use of an alternate route requires a significant change in travel patterns and travel time. The SR 99 corridor has multiple parallel routes in proximity of the facility that can serve as alternate route for the tolled facility.

The primary factors affecting route choice are travel time and cost. Modeling travel behavior in a system requires an estimation of travel time for multiple routes and the amount of diversion from the tolled facility, which flows from an understanding of the value of time for all modes of transportation using the facility. In the case of modeling for the Replacement Project, tolling scenarios were developed that varied the price of a trip by direction and time of day. Preliminary evaluation looked at seven different tolling levels applied to the facility by direction during five separate time periods (some tolls were the same for both directions) for single-occupant, HOV 2+, and HOV 3+ vehicles.³ (Appendix I) These rates are discussed in the *Updated Cost and Tolling Summary Report* to the Washington State Legislature prepared in January 2010 (Appendix I). More recent traffic analysis has focused on toll rates closer to the approximate \$2.75 - \$3.50 peak period level in 2008 dollars (\$3.50 - \$4.00 peak period level in 2015-level dollars).

Medium- and large-truck categories pay tolls based on the number of axles (Appendix I). Truck toll levels were also adjusted for time of day and direction of travel.

Travel models assume that drivers will understand the fastest route to their destination and adjust their route based on congestion levels and trip purpose. With tolling introduced to the system, drivers will also take into account the value of their time versus the cost of a toll and choose their routes accordingly. For example, commute trips are likely to correspond to times when most drivers value their time highly, and evening trips much less so. In order to capture revenue in the most effective way, toll systems are typically implemented with toll rates varying throughout the course of the day.

Tolling may cause vehicles to divert from SR 99 to other nearby roadways. The extent of the diversion and the travel patterns associated with the diversions is sensitive to the configuration of the facility, the available capacity on alternative routes, and the tolling implementation strategy. The percentage of diversion will differ throughout the day based on the level of the toll for that time period and the average value of time of drivers during that time period. It is not accurate to assume that a daily diversion percentage can be applied directly to a specific time period.

Transportation Improvement Program (TIP/STIP) and Regional Transportation Plan

Project approval in the Regional TIP by the Puget Sound Regional Council (PSRC) is one of the approvals needed to move forward toward construction authorization for the Replacement Project. Since the ROD is not yet complete, PSRC gave conditional approval for the design phase of the design build tunnel RFP on April 22, 2010. This update was approved for adoption into the State Transportation Improvement Program (STIP) on May 4, 2010.

The PSRC Executive Board has stipulated that the Replacement Project cannot begin construction until the ROD has been signed by FHWA. The Replacement Project was included Metropolitan Transportation Plan (Transportation 2040) on June 23, 2011 (Appendix M). It will be administratively updated in the TIP and STIP in July 2011, with the ROD anticipated to be issued in August 2011.

Public Outreach and Involvement

To gain input and to keep interested parties up to date with project development, the WSDOT project team developed and implemented a comprehensive, ongoing public involvement program at the onset of the decision-making and environmental analysis process. The public involvement effort identified specific goals and activities for outreach to the general public and elected officials, and incorporated outreach to minority and low-income populations. Public involvement is an ongoing effort that will continue through the life of the Project.

WSDOT received comments from the public through a range of outreach activities and tools that encourage public participation, including the following:

- Community and agency briefings
- Project website
- Media outreach
- Public meetings
- Briefings to local organizations, such as business, labor, and environmental groups

Input from agencies and the public play an important role in the decision-making and evaluation process for this Project. It influenced the Project's scope, design choices, and range of alternatives that have been advanced for further study in the environmental review process.

WSDOT will provide future public involvement opportunities as we move into construction. WSDOT will maintain the Project website and hotline so the public can easily get the most current information about project status. Individuals can also sign up on the website for e-mail

updates. The public can continue to submit comments and questions to WSDOT via the project hotline, e-mail, or mail. After the Record of Decision is issued, WSDOT will continue to inform the public about employment opportunities and construction activities through outreach activities such as community open houses. WSDOT will continue to respond to public questions, concerns and information requests for the duration of the Project.

Transportation Demand Management (TDM) / Transit

The Replacement Project is anticipated to have a considerable effect on local roadway traffic in King County and has developed a specific TDM plan for the area under the Moving Forward Program utilizing Active Traffic Management on Interstate 5 in the Downtown Seattle vicinity. WSDOT and the Seattle Department of Transportation (SDOT) are working together to keep traffic and freight moving during construction of the Alaskan Way Viaduct replacement. Several Intelligent Transportation System (ITS) projects around the city will provide real time traffic information to drivers. Drivers will see benefits from new traffic cameras and overhead electronic message signs when backups and incidents occur along SR 99 and I-5.

With the tolled bored tunnel, the Columbia and Seneca Street ramps on SR 99 will be removed, and all transit vehicles currently operating on SR 99 will need to exit and enter SR 99 in the stadium area. This change in transit service coverage will increase the number of buses traveling through south downtown Seattle by approximately 520 buses per day. Northbound buses traveling on SR 99 from West Seattle and South King County will instead use the new ramps located in the stadium area, and then travel on arterials in Pioneer Square to Third and Fourth Avenues to access downtown Seattle.

While added transit travel time will be incurred with the new stadium area ramps, transit vehicles traveling on SR 99 to the south end of downtown Seattle will have improved access to locations in SODO, Pioneer Square and other locations.⁴ These markets traditionally have had transit access only via local streets.

A measurable shift to transit by users avoiding tolls on SR 99 is not expected. Both transit users and general-purpose travel will experience higher travel times but not necessarily in equal amounts. However, any resulting variations in travel times will not result in measurable shifts from general-purpose travel to transit. Also, since transit service is oriented to users traveling to and from downtown, no transit service is expected to operate in the bored tunnel.

FHWA Annual Update Requirements

The Replacement Project Annual Update to the initial finance plan will be based on data collected from March to February over the course of a year and submitted to the Federal Highway Administration by June 1st of each construction year starting in 2012. Each update will reflect any changes in scope, risk, total and remaining project cost, and/or available funding. The last annual report in 2016 will cover completion of the contract.

Data for the annual updates will specifically cover the following time periods:

First Annual Update, August 2011 – February 2012, report on June 1, 2012

Second Annual Update Report, March 2012 – February 2013, report on June 1, 2013

Third Annual Update Report, March 2013 – February 2014, report on June 1, 2014

Fourth Annual Update Report, March 2014 – February 2015, report on June 1, 2015

Fifth Annual Update Report, May 2015 through substantial completion of the Project, report on or before June 1, 2016

Relationship of Financial Plan to Program/Project Management Plan

Program/Project Management Plans (PMPs) and Financial Plans have some overlapping areas of interest. Both plan types describe timing, anticipated risk, and estimated costs. However, PMPs have a greater focus on project scope and schedule, while Financial Plans have a greater focus on balancing project funding/budget and cash flows.

In relation to the Replacement Project, WSDOT has developed a “program” management plan based on Washington State and FHWA guidelines for major projects that covers the entire AWW corridor. The Replacement Project is covered by several major sections of this PMP. The PMP was submitted to FHWA September 2010 and was approved in December 2010.

WSDOT has determined that the AWW Program Management Plan and the Replacement Project Financial Plan are consistent and compatible.

5. Implementation Plan

This section, a summary of the information provided in the Project Management Plan, discusses how WSDOT will deliver the \$2.01 billion Central Waterfront as a component of the Replacement Project and will include discussion of the following:

- Current WSDOT Directives

- Project Delivery Methodology for the Alaskan Way Viaduct Replacement that applies to the Central Waterfront

- Pre-Construction Requirements (Environmental, Right-of-Way, Regional Transportation Planning)

- FHWA Annual Update Schedule and Project Management Plan Guidance Consistency

Management Tools to Monitor and Manage Risk

On July 1, 2008, the Washington State Secretary of Transportation issued Executive Orders 1032.01 and 1042.00 (Appendices E and F). In addition to the Executive Orders, Instructional Letter, IL4071.01 provides guidance for developing risk based estimating and how to manage risk reserves. These executive orders provide guidance to project offices on managing projects and using Project Management and Reporting Systems (PMRS). The PMRS includes the project Electronic Content Management (ECM) system to manage and report the status of transportation projects. The PMRS integrates schedule, contract management, ECM, cost control/earned value, and cost estimating with existing WSDOT legacy systems to better support management and delivery of capital projects. ECM is the electronic system used to satisfy document filing and retrieval, business process management (workflow), records management, and retention

requirements. WSDOT is in the process of implementing new and revised programs and systems for PMRS and ECM and the AWV office is incorporating the new systems as they are implemented.

Currently the Alaskan Way Viaduct Program Office uses Primavera Scheduler (contract and schedule management), PRISM (earned value/cost control), and tracking workbooks with bottom-up cost estimates. The Bored Tunnel Design-Builder is required to provide price-loaded schedules. An analysis of those schedules will be used as the basis for progress payments to the design-builder.

Project Delivery Methodology for the Alaskan Way Viaduct Replacement

WSDOT Delivery Methods⁵

WSDOT traditional methods of delivering transportation improvements projects typically use the Design Bid Build. This entails completing all of the design and right of way procurement before a construction project is advertised for bid. However, projects that are complex in scope and cost are evaluated to determine the best method for delivering a successful project.

The key benefits for employing design-build methodology for this construction segment include:

- The speed of delivering a project; and

- Innovative design approaches to complex construction involving bored tunnels.

To speed delivery, promote innovative approaches, and secure early price certainty, WSDOT employs a design-build method to design and construct a project. This process is described in WSDOT guidebook for design-build projects:

http://www.wsdot.wa.gov/NR/rdonlyres/46196EB8-F9D0-4290-8F55-68786B1DA556/0/DesignBuild_GuidebookJun2004.pdf

In design-build methodology, WSDOT focuses on describing performance rather than on how to obtain that performance. WSDOT identifies a conceptual plan and completes the preliminary design. This conceptual plan is put out for development of a design-build proposal. Each design-build team value engineers the preliminary plan and develops a cost estimate for their proposal. Each proposal reflects the product that the design-builder intends to deliver to meet WSDOT's objectives. WSDOT then chooses the design-builder with the best combination of elements, technical proposal, and price.

The contract is a single contract between WSDOT and the design-builder for design and construction services to provide a finished product. The design-builder completes the design, with WSDOT involvement in the design process. Because each bidder will have a different design proposal to address the identified project need, this Initial Financial Plan will not discuss the cost of specific design components.

After selection of a design-builder and execution of the contract, WSDOT performs administrative functions and the design-builder performs design, construction, quality control (QC), and quality assurance (QA) functions. WSDOT's quality verification (QV) role during

contract execution assures that the products being developed by the design-builder are in conformance with the contract requirements.

The QC/QA Program is a critical component of the design and construction of the Project. The focus of WSDOT's quality assurance program is on product compliance with contract documents, verification of the design-builder's quality control measures, and meeting Federal quality requirements. Quality assurance activities focus on monitoring contract execution with respect to a negotiated Quality Control Plan. WSDOT provides the quality verification and independent testing. The Contract Provisions require that the QC/QA Program submitted with the proposal be brought into conformance prior to execution of the contract.

Project Specific Delivery Methods

The project delivery methods applied to the Alaskan Way Viaduct Program are design-bid-build and design-build. All of the projects associated with the Moving Forward Projects, including the Holgate-to-King Project will be delivered using the design-bid-build method. The Replacement Project, excluding the Bored Tunnel contract will use the design-bid-build project delivery model. The Bored Tunnel is the only design-build contract within the program. See Appendices N and O for more information on design-build and design-bid-build methodologies.

By employing a design-build contract on the Bored Tunnel, the effort will benefit by:

- Relying on the contractor for innovation that could lead to a cost and time savings

- Experienced design-builders can handle more complex projects, which leads to better management of risks associated with Bored Tunnel construction

Pre-Construction Requirements

The Alaskan Way Viaduct Program is defined as a mega project due to its size and cost to replace it. Before any construction can begin on any of the projects, the Federal NEPA process must be signed off by the FHWA. A project must also acquire the impacted right-of-way before construction can occur. A project also has to meet regional transportation guidelines before construction funding can be approved for use.

Environmental Process and History

The Environmental process for the replacement of the Alaskan Way Viaduct began in early 2001 after the Nisqually Earthquake damaged the aging structure. Over the next six years several alternatives were studied to replace the viaduct. During that period one Environmental Impact Statement covered the entire Alaskan Way Viaduct corridor. As the alternatives were narrowed down to two, a Cut/Cover Tunnel and Elevated Structure, the citizens of Seattle voted in early 2007 to select a preferred alternative. The vote by the citizens was no for both alternatives. As a result of the **no/no** vote, the Governor, Mayor, and King County Executive unveiled the "Moving Forward Projects". These projects would keep advancing the replacement of the viaduct by concentrating on the removal of the southern mile of the viaduct, while the central waterfront section went under further study.

The environmental process for "Moving Forward Projects" was centered on the Holgate to King Project. This Project was granted by FHWA as being independent of any alternative that was chosen in the central waterfront section. An Environmental Assessment was conducted for the

Holgate to King Projects and the Finding of No Significant Impact (FONSI), was signed by FHWA on February 11, 2009 and published on February 25, 2009. All four stages of the Holgate to King Project are covered under the Environmental Assessment (EA). No non-mitigable environmental concerns were highlighted in the EA and FONSI.

An environmental re-evaluation covering the removal of the undercrossing and replacement with the “little h” overpass was prepared and approved in February 2010. This is the scope that was a result of the VE study in November 2009. The Stage 2 contract was changed with the issuance of its fifth addendum.⁶

The remaining other “Moving Forward Projects” are either Categorical Exclusions (CE) or Documented CEs, which have been signed by FHWA.

The environmental process in the Central Waterfront component has continued on and changed in January 2009 when the Governor, Mayor, and King County Council Executive chose to replace the central waterfront viaduct section with a bored tunnel.

The 2010 Draft SDEIS analyzed the Bored Tunnel Alternative and compared its effects against other alternatives that were studied previously. The Design-Build contractor for the Bored Tunnel continued working on the preliminary engineering effort from late January 2011 until the ROD is anticipated to be obtained in August 2011. Final Design and Construction is estimated to commence once the ROD is issued by FHWA. The timeline for achieving the environmental approvals is listed below:

Publication of the 2010 SDEIS in October 2010

Publication of the FEIS in July 2011

Publication of the ROD anticipated in August 2011

Environmental Approvals (Permits, Approvals, and Consultations)

Federal

National Marine Fisheries Service and U.S. Fish and Wildlife Service – Section 7 Endangered Species Act (ESA) Consultation and Marine Mammal Protection Act Consultation

National Marine Fisheries Service – Magnuson-Stevens Fishery Conservation and Management Act Consultation

Federal Highway Administration, with concurrence from the Washington Department of Archaeological and Historic Preservation – National Historic Preservation Act Consultation (Section 106)

State

Washington Department of Archaeology and Historic Preservation – National Historic Preservation Act, Section 106 Historic Preservation Consultation

Washington State Department of Ecology – Model Toxics Control Act, Removal of Underground Storage Tanks

Washington State Department of Ecology – National Pollutant Discharge Elimination System (NPDES), Construction Stormwater General Permit

Washington State Department of Ecology – Coastal Zone Management Act (CZMA), Consistency Certification

Washington State Department of Ecology – Underground Injection Control Registration

Washington State Department of Ecology – Notice of Intent for Installing, Modifying, or Removing Piezometers

Washington State Department of Ecology – Notice of Intent for Installing, Modifying, or Removing Wells

Washington State Department of Ecology – Chemical Treatment Letter of Approval

Local

King County – Industrial Wastewater Discharge Approval

Seattle City Light – Clearance Permits

Seattle Department of Planning and Development – Master Use Permit

Seattle Department of Planning and Development – Shoreline Substantial Development Permit/Conditional Use Permit and/or Variance

Seattle Department of Planning and Development – Grading Permit⁷

Seattle Department of Planning and Development – Building Permit

Seattle Department of Planning and Development – Demolition Permit

Seattle Department of Planning and Development – Side Sewer Permit

Seattle Department of Transportation – Street Use Permit

Right of Way

WSDOT is responsible for completing the purchase of needed properties for the Project. Major right-of-way acquisition was completed in the south end of the project area as part of the Holgate to King Street Project. Property acquisition activities have been initiated for the Design-Build SR 99 King Street to Roy Street – Viaduct Replacement (Bored Tunnel). The acquisition schedule is divided into four Right of Way (ROW) Certification dates. Additional ROW Certifications have been established for the North Access and South Access Design-Bid-Build contracts. [Figure 19](#) indicates the construction stage for each certification date.

Figure 19: Right of Way (ROW) Certification Schedule

ROW Certification Number	Project Component Covered by Certification	Description	Date
1	Bored Tunnel	Terminal 46 Temporary tieback Easement; two staging area leases	08/1/11 08/30/11 (F/C) ⁽¹⁾
2	Bored Tunnel	Tunnel Settlement Mitigation -11 Temporary Easements	03/30/12
2	Bored Tunnel	Tunnel Monitoring- 134 Rights of Entry	03/30/12
3	North Portal	Acquisition of two parcels; Temporary access and Tie-Back Easements	02/29/12
4	Bored Tunnel	55 Subsurface Parcels	10/31/12
5	Not Used		
6	North Access	Three partial/full acquisitions; Limited Access rights from seven parcels	07/31/12
7	South Access	Two Partial Acquisitions	12/31/13

F/C = Forecast

6. Current Cost Estimate

This section of the report outlines the Replacement Project cost estimate and the process for developing estimates. The sections that are discussed are:

- Project Costs
- WSDOT Cost Development and Risk Assessment
- Construction Cost Inflation Factors/Escalation
- Operating Period Costs (Bored Tunnel)
- Cost Estimate by Construction Segment

Project Costs

The Replacement Project is anticipated to cost \$2.16 billion (\$2.01 billion for the Central Waterfront and \$150 million additional components in the Replacement Project EIS (see notes below [Figure 20](#)). A summary of the Replacement Project cost estimate is shown in [Figure 20](#). Additional subsections provide detail on the estimated costs broken out by phase, state biennia and fiscal years, as well as by construction contract. First, however, is a description of WSDOT's methodology for developing costs and risks as background on how WSDOT developed its cost estimate.

Figure 20: Estimated Replacement Project Summary Costs

(\$ in millions, year of expenditure)

Source: WSDOT Cost Estimate to support WA State Legislature approved 2011-13 budget, 11LEGFIN

- 1. Viaduct Demolition and Battery Street Tunnel decommissioning are a subset of the \$290 million Surface will be refined in subsequent financial plans.*
- 2. The Mercer Street West component, work to be performed by the city of Seattle, has been included in this report because it is also cleared by the EIS*

WSDOT Cost Development and Risk Assessment

The Alaskan Way Viaduct Program followed the standard WSDOT design and construction procedures for all modes of project delivery, whether the Project is a design-build project or a traditional design-bid-build project. WSDOT conducts Value Engineering (VE) studies at appropriate stages of design, as required by the Federal Highway Administration, and incorporates the results of those studies in the design process. To lower risk for design choices and project costs WSDOT employs a process called Cost Estimate Validation Process[®] (CEVP[®]) as part of its program and project level cost risk assessment. This process is identified in WSDOT project management and cost risk documents included as Appendices B through G.

WSDOT has conducted CEVP[®], Cost Risk Assessment (CRA), and VE studies to document cost estimates for the Alaskan Way Viaduct Replacement Program. The Holgate to King Projects and the bored tunnel efforts have undergone these types of workshops in the past to estimate costs.

Construction Cost Inflation Factors / Escalation

Background & History

Cost estimates for highway capital projects are developed based on current prices from recent bidding experience. This approach is used to estimate the various elements of the project. The project estimate is the sum of these individual elements or work items. The cost estimates are entered into the Capital Program Management System (CPMS) in current year dollars to support development of the capital budget. CPMS calculates year of expenditure dollars by applying inflation forecast assumptions to the estimates based on the project delivery schedule. The Alaskan Way Viaduct Program forecast is not inflated by CPMS. All forecasts are assumed to be year of expenditure values for this program.

WSDOT's estimate basis for inflation rates are:

Engineering (design) phase – Global Insight forecast for Engineering, Architectural, and Surveying salaries;

Right-of-Way phase – Economy.com's forecast of the Federal Housing and Finance Administration housing price index for the state of Washington; and

Construction phase - Global Insight Forecast of the Construction Cost Index.

Escalation for the Alaskan Way Viaduct Program used the following method

The Escalation Input Assumptions were based upon WSDOT-mandated inflation tables in effect at the time of the CEVP®. These tables are based upon the cost indices in effect for preliminary engineering, right-of-way and construction phases and are then applied to the base estimates and risks developed for each of these phases in order to provide a year-of-expenditure (YOE) forecast. This risk-based estimating process then provides WSDOT a range of probability (from 10 percent to 90 percent) of costs. For projects over \$10 million, it is WSDOT policy to use the 60th percentile as the high end of the probability range (Appendix G).

Operating Period Costs

As a tolled section of roadway, once completed, the AWW Viaduct Replacement Project will be operated and maintained by WSDOT's standard processes and budget with funding coming from gross toll revenues. WSDOT takes full responsibility for the ownership, operation, and maintenance of the facility. The overall WSDOT budget, which includes provisions for operational and maintenance activities, is enacted biennially by the state legislature and the Governor. Interim year supplemental budgets may also be enacted. Per the *SR 99 Alaskan Way Viaduct Replacement updated Cost and Tolling Summary Report* (Appendix I), the tunnel annual operation and maintenance costs are estimated at \$5 million.

Cost Estimate by Construction Segment

The Replacement Project cost estimate information is detailed in this section. The \$2.01 billion cost to replace the Central Waterfront portion of the Replacement Project was established by holding CEVP® and Value Engineering (VE) workshops that focused on the Holgate to King Project and the Bored Tunnel section of the corridor. These workshops that were held in late October of 2009 validated the current \$2.01 billion Central Waterfront cost. Since then, the team has worked on refining the cost estimates for both of the Holgate to King and Bored Tunnel efforts. Detailed estimates for the Holgate to King Project can be found in the 2010 Finance Plan update that was submitted to FHWA in December 2010. [Figure 21](#) shows the \$2.01 Central Waterfront work by phase and section, as well as the full \$2.16 billion dollar estimate that includes Surface Street and Mercer Street West components.

Figure 21: Replacement Project Summary Cost Estimate by Segment

(*\$ in millions, year of expenditure*)

Source: WSDOT Cost Estimate to support WA State Legislature approved 2011-13 budget, 11LEGFIN

1. Viaduct Demolition and Battery Street Tunnel decommissioning are a subset of the \$290 million Surface Street Restoration effort. The figures shown here are preliminary estimates that will be refined in subsequent financial plans.
2. The Mercer Street West component, work to be performed by the city of Seattle, has been included in this report because it is also cleared by the EIS.

Estimate by Major Project Element

The cost estimate information used in this report is the basis for the development of the 2011 Legislative Budget.⁸ The total estimated cost to complete the state's responsibility is \$2.01 billion, plus an additional \$150 million for the remaining components included in the EIS.

The \$2.01 billion estimate is broken down into major project elements. A project element is a category of work which will be conducted on some or all of the segments (i.e., design, construction, etc.). [Figure 21](#) summarizes the Replacement Project costs aggregated together by project phase and date. This data is based on cost estimates developed for the recently passed transportation budget referred to as 11LEGFIN (Appendix L).

Bored Tunnel Design-Build Contract

The proposed bored tunnel segment includes the following major construction elements, with associated construction costs identified in Figure 22.

Bored Tunnel, Cut/Cover Tunnels, Portal Buildings, Tunnel Boring Machine (TBM), and Tunnel Systems

Site Preparations for the North and South Access

Intelligent Transportation System (ITS) Integration Contract

Miscellaneous Contracts (Landscaping and Utility Support)

Relocation of utilities that are impacted by tunnel construction

Construct tolling system

Figure 22: Bored Tunnel Contract Construction Phase Engineering Cost Estimate

(*\$ in millions, Year of Expenditure*)

Source: Ebase Construction Estimate, version 99, January 2011

1. See Figure 26 in Section 9 for more detail on contingency items.

North Access, South Access & North Surface Streets Design-Bid-Build Contracts

The North Access segment includes the following major construction:

Constructs North SR 99 Mainline and On/Off Ramps

Extension of 6th Avenue from Harrison Street to Mercer Street

The North Surface Streets segment includes the following major construction:

Reconstruction of surface streets over the north portal cut/cover tunnel

Backfilling the north portal of the Battery Street Tunnel

Improvements to the City Surface Streets between Denny Way and Harrison Street

The South Access segment includes the following major construction:

Provide Permanent Southern connection from the cut/cover tunnel provided by the Proposed Bored Tunnel segment to the Holgate to King Project at Royal Brougham Way

Reconstruction of surface streets over the south portal cut and cover tunnel.

Combined these contracts are anticipated to cost about \$103.5 million. The scope of work for these contracts is not fully developed and therefore detailed construction phase estimates are not available at this time. The detailed estimates will be included in future Replacement Project Financial Plan Annual Updates when they are available.

7. Project Funding, Revenues, and Financing

The Replacement Project will rely on a variety of fund sources from State, Federal, and Local participants. State secured funding comes from State Motor Vehicle gas tax and Toll funds. The toll funds will be used by leveraging future toll revenues from tolling the Bored Tunnel section of SR 99. [Figure 23](#) diagrams the Replacement Project sources of funding, and the following subsections describe the funding sources in more detail. Figure 23 is an illustration of the sources of Replacement Project Funds.

Figure 23: Examples of Sources of Funds for the Replacement Project

Replacement Project

- State Motor Vehicle Fuel Tax Revenues
- Transportation Partnership Account (TPA)
 - Nickel Account
 - Central Waterfront Project
 - Toll Funds
 - Toll Revenues
 - Toll Bond Proceeds
 - Federal Funds
 - Emergency Repair
 - SAFETEA-LU
 - High Priority & PNRS
 - Bridge
 - Local Funds
 - Port of Seattle

City of Seattle

State Funding — Transportation Partnership Account (TPA) and Nickel funds

The Transportation Partnership Act was a state funding package passed by the Washington State Legislature in 2005 to help finance specific projects and created the Transportation Partnership Account. The account is primarily funded by a 9 ½ cent motor fuel tax with a minor amount coming from other vehicle-related fees. The TPA provides the majority of the state funding for the SR 99 AWV Program, at \$1.51 billion. In addition, the 2003 Nickel Package provided funding for various projects using a 5 cent motor fuel tax. Collectively, the TPA and Nickel Package provide \$1.71 billion to the SR 99 AWV Program, as described in Section 3. Of this amount, \$1.17 billion has been targeted for the Replacement Project.

Other State funding sources that are financing the Replacement Project come from the Multi-Modal Account and the Motor Vehicle Account. These amounts are \$129.1 million and \$34.7 million respectively.

Toll and Bond Authorization

Toll Authorization - State

The Washington State Legislature approved Engrossed Substitute Senate Bill (ESSB) 5768 during the 2009 session (RCW 47.01), which identified a deep bored tunnel as its preferred option for replacing the SR 99 Alaskan Way Viaduct. ESSB 5768⁹ identified funding in the following manner.

ESSB 5768, Sec. 1. A new section is added to chapter 47.01 RCW...

(2) The state route number 99 Alaskan Way viaduct replacement project finance plan must include state funding not to exceed two billion four hundred million dollars and must also include no more than four hundred million dollars in toll revenue.

ESSB 5768 also directed WSDOT to prepare a traffic and revenue study to determine the potential for tolls to contribute to construction funding. On January 15, 2010, the team submitted the “*SR 99 Alaskan Way Viaduct Replacement Updated Cost and Tolling Summary Report*” (Appendix I). Several tolling scenarios were analyzed and documented in the report to determine if enough revenue could be generated to meet the \$400 million need. The study found that four of the five scenarios could approach or exceed the \$400 million target for toll funding when the assumptions for tolling were to solely generate revenue. The technical question of whether WSDOT could generate sufficient toll revenue was confirmed by this study based on the cost, schedule, and financing assumptions at that time.

WSDOT is currently working with the city of Seattle to further evaluate traffic and revenue assumptions to coordinate other aspects of toll decisions and confirm the final goals of tolling. The traffic models show that maximizing toll revenue may create significant traffic diversion onto city streets. In 2011 to 2012 WSDOT and the City will conduct further study and negotiation on the goals of tolling to determine a balance between revenue generation and traffic effects.

In addition to the direction granted under ESSB 5768 the AWV Program will seek additional legislation during the Washington State 2012 legislative session. These include the authority to implement tolls on a defined section of roadway and the authority to issue debt repayable by future toll revenue. See appendix I for further information on tolling implementation.

Toll Authorization - Federal

On June 1, 2011, WSDOT provided FHWA with an expression of interest and draft toll agreement, requesting FHWA authorization of tolling on SR 99 in downtown Seattle. That request is pending FHWA approval in summer 2011 (Appendix J).

Bond Authorization

The Washington State Legislature has committed \$2.8 billion of funding towards WSDOT's portion of the AWV Program as part of ESSB 5768 and approved WSDOT's award of the design-build contract to construct the bored tunnel with the understanding that bonding will be needed on the up to \$400 million in toll revenues. Thus, through intent, the Washington State Legislature has provided WSDOT with the path forward to bond authorization in 2013.

Authorization to generate construction funding secured by future toll revenue requires bonding authority from the Washington State Legislature with a 60 percent majority vote. WSDOT does not anticipate the need for toll backed bonds until late in the construction schedule, around calendar year 2014, and tolling will not start until 2016. Therefore, the final investment grade studies to support bond issuance will not be developed until closer to the time when funding will be required.¹⁰

The current plan is for \$400 million of the \$2.8 billion to be provided by toll backed funding. The risk for not receiving legislative bond authorization appears low. However, if the authority to sell bonds paid by toll revenue is not granted, WSDOT will work with the legislature to find alternative sources of funding. Options may include a mix of the following: reducing or deferring other WSDOT projects within the state, alternative financing with private parties, perhaps pursuing other federal programs like the Transportation Infrastructure Finance and Innovation Act (TIFIA), revising use of other funding from Port or local sources, or perhaps using the capacity within WSDOT's federal program.

Federal Funding

Through dedicated federal funding identified in SAFETEA-LU Section 1301, *Projects of National and Regional Significance* (PNRS), the overall Alaskan Way Viaduct Replacement corridor received approximately \$220 million (\$199.3 million after the federal reduction) which is counted as part of the overall \$2.8 billion in corridor cost for the state. The state plans to use \$120 million in federal formula bridge funds, \$51 million in Surface Transportation Program funds, \$50 million of National Highway System funds, \$48 million in Emergency Relief funds, \$10 million in High Priority Program funds, and \$4 million in Demonstration Project funds.

Based on WSDOT's current budget and estimates, the Replacement Project expects to use \$228.6 million of the corridor's federal funds for final design, right of way acquisition, and construction. These federal funds will be dispersed through the Washington State Motor Vehicle

fund. This Project did not receive any federal stimulus funding from the American Recovery and Reinvestment Act of 2009 (ARRA).

Advance Construction

For background, Advance Construction is a technique which allows a State to initiate a project using non-federal funds while preserving the eligibility for future federal-aid funds. Under this approach, the AWV Replacement program is authorized by FHWA without the obligation of federal funds and with no commitment by FHWA that funds will be available in the future. WSDOT will use its own funds to pay project costs. As federal funds are available, WSDOT may decide to convert the Project and request that federal funds be obligated. There is no obligation of federal funds until the advance construction is converted, at which time the AWV may be reimbursed for the federal share of costs incurred from the original date of authorization.

FHWA allows the incremental conversion of advance construction projects, providing WSDOT the opportunity to manage its limited federal funding while potentially accelerating the delivery of the Alaskan Way Viaduct through the most efficient use of the project's various funding sources.

Within the Alaskan Way Viaduct Program certain projects may warrant the use of Advance Construction funds. However, at this time the Replacement Project does not specifically plan to use Advance Construction.

City of Seattle Funds

The city of Seattle has committed up to \$50 million for utility relocations within the footprint of the Bored Tunnel. These utilities will be relocated by the Design-Builder and billed to the WSDOT. WSDOT will then recoup these costs from the city of Seattle. An agreement has been executed between WSDOT and the city of Seattle for this work.

A small amount of local funding has been provided by local private utility providers for relocation work performed on their behalf.

Port of Seattle Funds

The State of Washington and the Port of Seattle are committed to a replacement for the viaduct that will improve transportation access to and through the waterfront, including access for over eight million annual ferry riders, ensure connectivity between the Interbay, Ballard and Duwamish industrial areas and Seattle-Tacoma International Airport, including a corridor for oversized vehicles, provide access to port cargo, fishing and cruise facilities, minimize construction disruption, and increase opportunities for the public and freight to access the shoreline and waterfront. To the extent feasible and authorized by the Port Commission, the Port shall fund or procure funding within the life of the project not to exceed \$300 million toward the state's program elements including Port contributions to Moving Forward Projects, and AWV Program elements. Funding must be for elements that will improve transportation access to and through the waterfront near the Port of Seattle. The State acknowledges that contributions will be made during the life of the AWV surface street efforts. It is understood that the majority of the Port's contribution will occur in the years 2016 to 2018 (Appendix P).

8. Cash Flow

The specific schedule of payments for the Replacement Project is a function of existing plans for design and right of way along with the contractual commitments WSDOT entered into when it signed the contract with Seattle Tunneling Partners (STP). [Figure 24](#) shows the source of project funding by source and biennium.

Figure 24: Replacement Project Cash Flow by Source

(\$ in millions, year of expenditure)

Source: WA State Legislature approved 2011-13 budget, 11LEGFIN

1. *Local funding includes \$50 million in reimbursements from the city of Seattle for utilities work performed by the Project's design-builder.*
2. *Viaduct Demolition and Battery Street Tunnel decommissioning are a subset of the \$290 million Surface Street Restoration effort. The figures shown here are preliminary estimates that will be refined in subsequent financial plans.*
3. *The Mercer Street West component, work to be performed by the city of Seattle, has been included in this report because it is also cleared by the EIS.*
4. *Use of this funding is dependent on a future federal authorization act. If this funding is not found to be applicable, WSDOT will use other eligible federal funds available.*

Spending Cap Condition

The construction estimates for the bored tunnel described in Section 5 of the report reflect the base cost needed to deliver the Project. The base cost does not address risk and escalation. The development of the upset price for the Bored Tunnel Design-Build segment has a risk and escalation component added to the base cost.

Section 10.4.1 of the RFP Design-Build contract describes the maximum rate of payment to the design-builder. Due to the rate that funding will become available to the project payments to the design-builder shall not exceed the payment schedule shown in [Figure 25](#).

Figure 25: Cap on Payments to the Design-Builder

(\$ in millions, Year of Expenditure)

Data obtained from Section 10.4.1 of the RFP.

Contingency Fund

Section 11 of the RFP Design-Build contract governs changes in the contract. The design-builder is responsible for errors in the design documents, errors in the schedule, actions of a subcontractor, cost of materials, correction of nonconforming work, and failure to comply with contract requirements. Change orders are submitted to and evaluated by WSDOT. Change orders with an aggregate cost of \$200,000 and greater are also submitted to and evaluated by FHWA. For unforeseen requirements and increases in construction costs the contingency for the design-build portion of the Replacement Project is 17 percent (Figure 22).

9. Risk Identification, Mitigation, and Other Factors

WSDOT addresses risk through a systematic approach to project delivery. As mentioned in section 4 of this Initial Financial Plan, WSDOT employs a CRA-CEVP[®] process to lower risk for design choices and project costs. Starting with the CRA-CEVP[®] process early in design development, WSDOT identifies potentially challenging project issues so that when the design-build contract is awarded, there is less chance of surprise and subsequent cost overruns. WSDOT recognizes that not all risks can be avoided.

CEVP[®] is a workshop format, followed up with mathematical modeling, typically conducted at key stages of design on very large (\$100 million or more), very complex projects. These stages are triggered when costs or scope are completed during the preliminary design phase prior to release of the initial request for proposal for design-build projects. The Cost Risk Assessment (CRA) process follows the same format as the CEVP[®] process, but at a smaller scale. CRAs typically are performed on smaller (\$25 million to \$100 million), less complex projects.

The CRA-CEVP[®] process at WSDOT combines national and local area subject matter experts and experienced staff. Many of the participants have had extensive first-hand experience in large project programming and delivery. The evaluation is enhanced by the application of computer modeling that applies risks identified by experts in the workshop and makes allowances for unknowns which are each assigned additional costs. The models then run Monte Carlo simulations, with hundreds of iterations to establish a robust probability curve. Each successive re-assessment allows for the development of a tighter cost range as previously identified risks are mitigated and more is known about the project. In depth details regarding the CRA-CEVP[®] process, as well as the Value Engineering (VE) process may be found on the WSDOT website:

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

As required by Engrossed Substitute Senate Bill (ESSB) 5768 (See Section 7, Project Funding, Revenues, and Financing), in November and December of 2009, the project team held a series of workshops that utilized Value Engineering (VE) to reduce cost and risk associated with the Holgate to King Project and the Central Waterfront portion of the Replacement Project. The focus of these workshops refined the base cost estimate and associated risks. In total the VE team implemented several cost savings measures, for a total of \$310 million. The Holgate to King Project accounted for \$140 million of the savings and the remaining \$170 million was associated with the Central Waterfront portion of the Replacement Project. These savings were used to adjust the base cost of the Central Waterfront that was used in the January 2010 CEVP[®] run. Refer to Appendix H for more details on VE recommendations and Risk Management.

The results of the January 2010 CEVP[®] showed that the overall cost of the bored tunnel was forecasted to be \$1.54 billion at the 10 percent probability; \$1.80 billion at the 50 percent probability, and \$2.25 billion at the 90 percent probability. The WSDOT project management directed the team to use the 60th percentile estimate of \$1.96 billion, as required in WSDOT Instructional Letter IL 4071.01. This estimate was \$60 million more than the previous CEVP[®] results. The net rise in the tunnel cost is due to moving the north and south portal locations to lessen the amount of curvature in the tunnel. This change added approximately 640 feet to the tunnel.

The savings gained from Holgate to King Project offsets the increased cost of the bored tunnel and keeps the overall cost of replacing the Alaskan Way Viaduct with the \$3.1 billion budget.

Since that time, Cost Risk Assessments (CRA) were performed for the South and North end Design-Bid-Build components of the Replacement Project (excluding the city of Seattle Mercer St Widening component) in June 2010. This series of CRAs resulted in establishing the 60th percentile base cost for the Central Waterfront portion of the Replacement Project outside the bored tunnel and established the Risk Registers and profiles for each effort.

Also in June 2010, “The Basis and Amounts for Allocation of Risk” for the Central Waterfront component of the Replacement Project was written to establish program guidelines for allocating risk to the bored tunnel and portals. This document discusses four categories (A through D) of risk with the last category being escalation.

Category A defines risk that the Design-Builder has the most control over. Typical risk items include: design of the Tunnel Boring Machine (TBM), jobsite accidents, constructability of the bored tunnel, control of traffic, and the contract schedule.

Category B risk is shared between the Design-Builder and WSDOT. Typical risk elements that require collaborative management such as the protection of buildings and structures, TBM pressure head conditions, and safety will be covered under this category.

Category C risk is all items that are managed by WSDOT for the Central Waterfront portion of the Replacement Project. Typical risk elements that require WSDOT management such as the issuance of the Record of Decision (ROD), Third Party Agreements, Right of Way acquisitions, differing site conditions, and risks associated with the South and North Design-Build portions of the Replacement Project will follow under this category.

Category D is the risks associated with inflation. The inflation rates that were derived in section 4 of this report will be consistent with the rates referenced in the June document.

The risk budgets associated with the bored tunnel is shown in Figure 26.

Figure 26: Allocation of Risk/Inflation
(\$ in millions, Year of Expenditure)

Risk Categories	Amount
Categories A+B: Risk items (DB and WSDOT Shared Risks)	
Contaminated Soil	50.0
Work in Hyperbaric Conditions	40.0
Building Settlement Mitigation	20.0
Port of Seattle Lease Terminal 46	20.0
Schedule Acceleration	25.0
Bonding & Insurance	100.0
Utility Reimbursements from city	(50.0)
Cat A+B SUBTOTAL:	205.0
Category C: Unallocated Risk	100.0
Category D: Inflation/Escalation	110.0
TOTAL: Risk & Inflation Budget	415.0

Source: WSDOT Cost Estimate to support WA State Legislature approved 2011-13 budget, 11LEGFIN

Risk Budgeting

As a cost containment measure to preserve planned transportation budgets, WSDOT establishes a ceiling price for design-build contracts. This ceiling is called the “upset price”, and is set based upon the most current estimate. If all proposals are above the upset price, WSDOT will request Best and Final Offers (BAFOs). In this process WSDOT will pull out parts of the scope and ask the proposers to re-bid the reduced-scope project. After the BAFOs have been received, WSDOT will re-evaluate and revise ratings.

Based on the January 2010 CEVP[®] estimate, WSDOT has set an upset price of \$1.09 billion for the design-build contract. The Cost Estimate by Construction Segment and Cost Estimate by Major Project Element sections of the Initial Financial Plan detail the expenses that make up the total of \$1.09 billion.

The Apparent Best Value Score shown in Figure 27 was determined by WSDOT on December 9, 2010. The Apparent Best Value Score is determined by weighting the assigned technical credits and associated proposal price. The lowest Apparent Best Value Score was given to the Seattle Tunneling Partners (STP).

Figure 27: Bored Tunnel Best Value Determination

(\$ in Thousands, Year of Expenditure)

Contract 7999 Proposer Name	Apparent Best Value Score	Assigned Technical Credits	Proposal Price
Seattle Tunnel Group (STG) 2 nd Best Value Design-Builder	1,050,150	38,152	1,088,302
Seattle Tunnel Partners (STP) Apparent Best Value Design- Builder	1,018,123	71,577	1,089,700
Upset Amount, \$1,090 million. The successful proposal will be the one calculated to have the lowest Apparent Best Value			

Data obtained from Section 10.4.1 of the RFP.

The Best and Final Offer was less than the upset price and therefore, the Bored Tunnel was awarded to STP for completion.

To better handle project setbacks that affect schedule and budget on a design-build contract, WSDOT project managers go through several steps to minimize problem areas. These Best Practices are written into the design-build request for qualifications and RFPs. Links to the RFQ, RFP, Instructions to Proposers, Addenda, and other information for design-build contractors who bid on the Bored Tunnel are on the web page at the following link:

<http://www.wsdot.wa.gov/biz/contaa/DESIGNBUILDCONTRACTS/SR99AWVBoredtunnel/DEFAULT.HTM>

Bid scoring includes weighing how well submitters minimize potential problems. Examples of best practices include:

- Assuring full understanding of the scope and timing of work

- Identification of key personnel to assure adequate project understanding and oversight

- Security Bond requirements to cover additional work costs if items are not completed by the design-builder

Section 2.14 of the RFP requires the design-builder to comply with all federal, state, and local laws and regulations governing water as well as to perform temporary water pollution and erosion control measures shown in the contract documents or required by WSDOT. The design-builder must also meet many environmental commitments that are outlined in Appendix K.

Risk Monitoring

The contract specifies the scope to be completed for the Project. The design-builder develops a baseline contract schedule that is used to track progress of the Project. The design-builder's

baseline schedule is required to be price loaded and is used to develop a planned progress curve (dollars expended over time).

The design-builder plans their work through more detailed schedules that cover durations varying from weekly to 90-day look-ahead schedules. These schedules are typically reviewed at daily schedule meetings for crew supervisors and weekly meetings between WSDOT and Design-Builder's management staff. WSDOT and the design-builder will agree on the specific review schedule.

WSDOT monitors the daily design and construction activity through over-the-shoulder reviews and construction compliance inspections. The design-builder submits schedule updates and invoices to WSDOT on a monthly basis. Monthly schedule updates are reviewed with regard to contract requirements, schedule management principles, and reasonable progressing of the schedule activities. Once approved by WSDOT, the schedule update becomes the basis of the monthly invoice.

Along with each invoice will be a progress report, certification by design and construction quality assurance managers, invoice data sheets and supporting documents based on the price loaded contract schedule, and a monthly design exception report. The monthly progress report includes a narrative that discusses the contract milestones and critical path, and plans to achieve completion dates. The narrative includes discussion of quality management, environmental protection, utility coordination, public relations, cooperation with adjacent contractors, and safety performance.

At this time the monitoring methods for the design-bid-build portions of the Replacement Project are not yet fully developed. They will be described more fully in future annual updates.

Incentives and Damages

The design-build contract identifies the scope that needs to be accomplished as well as incentives/disincentives and liquidated damages.

Incentives

Up to \$85 million in incentive awards can be earned by the Design-Builder after the physical completion of the work for:

- Cost savings associated with extraordinary intervention.
- Cost savings associated with deformation mitigation and repair work.
- Schedule acceleration.

Damages

The RFP (section 17) specifies liquidated damages for each day of delay in achieving substantial completion beyond the established deadline. The design-builder must pay liquidated damages for:

- Late completion
- Failure to open lanes and ramps
- Failure to meet contract milestones

10. Conclusions and Summary

The Alaskan Way Viaduct Replacement Program is fully funded. Funding comes from:

- 73 percent by the state motor vehicle fuel tax and state tolling,
- 15 percent by federal funding,
- 10 percent by Port of Seattle funding, and
- 2 percent by local funding provided by the city of Seattle.

The Replacement Project is fully funded and its funding breakout comes from:

- 80 percent by the state motor vehicle fuel tax and state tolling,
- 11 percent by federal funding,
- 2 percent by Port of Seattle funding, and
- 7 percent by local funding provided by the city of Seattle.

WSDOT's budget for the Replacement Project includes a contingency amount for potential cost overruns. WSDOT is confident that the financial commitments for the Replacement Project are sufficient despite the impact the current economic downturn has had on motor fuel tax revenue. As a high priority project in Washington State, the state is committed to funding and building the Replacement Project as a critical component of the Alaska Way Viaduct program.

For further information, please contact:

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