Puget Sound Gateway Project

SR 509, I-5 and SR 167 Funding and Phasing Study: Strategic Corridor Design Review

Appendix D:
Second Design Workshop

Washington State Department of Transportation

September 2013

13-07-0002091

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Appendix

1. WORKSHOP OVERVIEW

The second design workshop was held on Wednesday, March 12 and Thursday, March 13, 2013. The agenda and attendee sign-in sheets are in Appendices D.1 and D.2, respectively.

1.1 Introductory Remarks

In the introductory remarks, WSDOT project leaders presented an overview of the project and set the direction for the workshop.

Project Overview – The Gateway Project develops SR 167 Completion, I-5 Express Toll Lanes (ETL) and SR 509 Completion projects as a system rather than separate projects. The I-5 Express Toll Lanes will connect the SR 167 and SR 509 projects, and will provide the benefits of integrated traffic operations and the tolling approach that improves I-5 operations between the new SR 167 and SR 509 connections. Since 70 to 80 percent of the traffic expected to use the new corridor connections travels to and from I-5 within the section between SR 167 and SR 509, increasing the I-5 capacity through express toll lanes will help I-5 accommodate the added traffic demand.

The segment of express toll lanes from SR 16 in Tacoma to I-90 in Seattle has been studied as part of a FHWA grant-funded project for a regional network of dynamically express toll lanes. Its initial phase could be conversion of the HOV lanes to express toll lanes (ETL) operation. The Gateway project includes a second express toll lane in each direction between the SR 167 and SR 509 interchanges.

The comprehensive tolling study for SR 167 was completed in January 2013 and supplements the toll feasibility studies completed for both SR 167 and SR 509 in 2010. The 2013 study uses current tolling assumptions on the value of time and revenue generation from the SR 520 bridge project. These current assumptions result in lower revenue generation than forecast in the 2010 tolling feasibility study,

Workshop Direction – Based on discussions with the legislature, WSDOT identified a $1.8 billion investment level target for the Puget Sound Gateway (Gateway) Project. The investment level target represented the approximate commitment that the legislature would consider for an initial phase of the Gateway Project. The state funding package will require new legislation, and would be part of a Gateway Project funding package requiring a combination of new funding from the state, stakeholder contributions and toll revenues. The $1.8 billion initial investment will be for an initial phase to cover the first ten years (2020 through 2030) of the Gateway Project. Future investment will strategically add capacity as traffic demands on the highway system grow. Tolling will provide a revenue source that can supplement primary revenue sources such as gas tax and motor vehicle excise tax (MVET) as determined by the legislature.

Legislators and other stakeholders see freight mobility as a key benefit of the combined Gateway projects. The Second Design Workshop will provide supporting information for

stakeholder meetings in the two weeks following the workshop. Stakeholders have expressed a high interest in four-lane projects, two in each direction, for both the SR 167 and SR 509 completion projects. The workshop needs to consider how tolling on SR 167 and SR 509 affects the traffic demand in the four lane project segments.

1.2 Workshop Goals

Four main goals were set out for the workshop:

- Validate approaches identified to date for the baseline SR 167 and SR 509 projects
- Identify further opportunities for cost reductions
- Develop the initial implementation and phasing plans and schedules for the three corridor
- Identify funding gaps in revenue versus traffic for financing

1.3 Workshop Objectives

Workshop participants were asked to identify the best Gateway project alternatives that could be constructed for the $1.8 billion investment level. The project alternatives could be phased over a 20 year timeline, but the initial phase needed to complete major elements of the full project. The initial Gateway Project phase should provide equitable benefits for each corridor stakeholder group and should be an initial phase of the future four-lane SR 167 and SR 509 corridors. While developing the initial phases, the participants should consider how design-build delivery and public-private partnership (P3) approaches could benefit phased implementation.

The workshop used the estimated toll contribution for the combined project in considering the development of phasing. This included determining what the cost increments were versus the revenue obtained (for example, the cost of the second I-5 ETL compared to the incremental revenue over the initial HOT lane conversion).

2. DAY 1 (MARCH 12, 2013)

2.1 Morning Session

2.1.1 Traffic Modeling Results

The updated traffic model for the Gateway Project included SR 167, SR 509 and the I-5 Express Toll Lanes as a combined project with all vehicles tolled on the SR 167 and SR 509 extensions, and the two-lane express toll lane system on I-5. SR 167 and SR 509 were modeled for their baseline configurations, Phase 1 and Option C, which are both two-lane highways, with one lane in each direction. Both also include auxiliary lanes over limited segments; however, auxiliary lanes have no effect in macroscopic modeling. The I-5 ETL was modeled for a single HOV lane conversion from SR 16 to I-90 with a second express toll lane added between SR 167 and SR 509. Toll rates were set to maximize revenues for SR 167 and SR 509 (see Figure D- 1), and the I-5 ETL toll rates were dynamically set to maintain 45 mph or greater speed in the ETL.

Modeling was done for 2016 and 2030 forecast years using five daily time periods. The combined time periods provide daily travel forecasts. In comparison to the traffic modeling for the SR 167 and SR 509 Environmental Impact Statements, the current Puget Sound Regional Council (PSRC) model included population and employment forecasts that were lower in future years due to the recent economic recession.

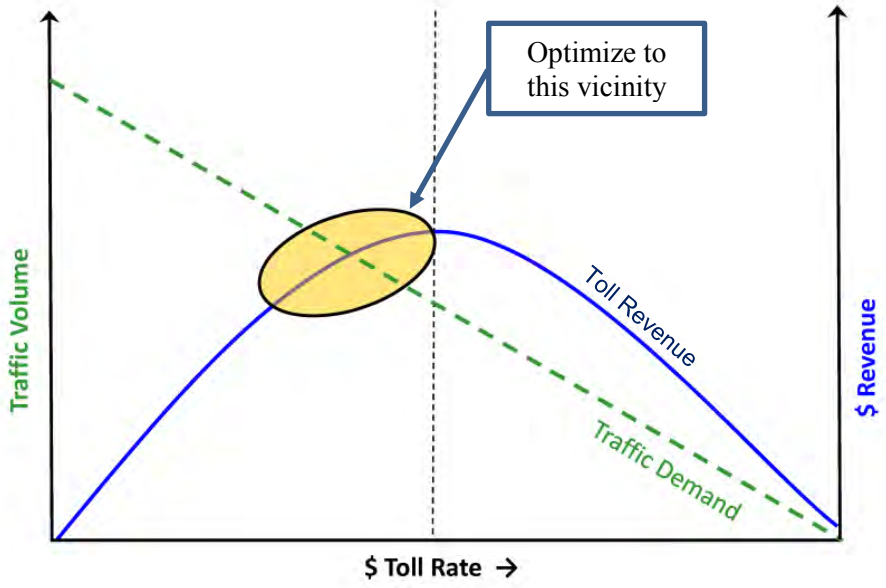

Figure D- 1 Conceptual Toll Demand Function and Revenue Curve

I-5 shows about eight (8) percent higher traffic volumes with a single express toll lane (ETL) open to tolled vehicles and HOVs with three or more occupants (HOV3+), than without ETL operation. Adding a second ETL between SR 167 and SR 509 increases I-5 traffic capacity about 20 to 22 percent over I-5 without ETLs.

SR 167 and SR 509 operate satisfactorily through 2030 as fully tolled highways. If tolls are not implemented, the traffic models indicate that both SR 167 and SR 509 would have traffic demand for a six-lane section, two general purpose and one HOV lane in each direction.

During the traffic modeling discussion, the participants noted that stakeholder and public perception were impacted negatively by the south King County operation of the two-lane SR 18 (untolled) and the time it would take to convert from two-lane to four-lane facilities. Due to the proximity to ports and the amount to heavy truck travel, there is concern by the public that there would be delays to both users of a single lane without provision for passing lanes.

2.1.2 Tolling/Revenue Results

The Gateway project toll revenue was estimated from a single, macroscopic[1] regional model with tolling on all three facilities: SR 167, I-5 ETL, and SR 509. The January 2013 SR 167

[1] The Gateway Project traffic and revenue analysis was based on the regional, four-county travel demand model used for the SR 520 Final Environmental Impact Statement (FEIS).

Comprehensive Tolling Study used a more detailed mesoscopic[2] model, but modeled only SR 167 and not the effects of having I-5 ETL and SR 509 also tolled. The current model shows about $60 million in tolls generated are generated on SR 167 (less productive than either I-5 ETL or SR 509).

The revenue for SR 167and SR 509 were modeled initially at 75 pre-paid (toll transponders) growing to 90 percent over time. For comparison, SR 520 currently is 80 percent pre-paid. The toll rates for SR 167 and SR 509 are modeled constant over time (not inflated) per the Washington State Treasurer's direction. The I-5 ETL rates will increase over time with higher traffic demand in order to maintain a 45 mph or greater speed in the ETL(s).

Based on preliminary forecasts, I-5 will generate greater revenues than SR 167 and SR 509. A 30-mile long I-5 ETL system could generate about $2.96 billion net revenue from 2020 through 2059, while SR 167 and SR 509 could generate $451 million and $524 million, respectively[3].

The revenue analysis for the I-5 ETL assumes heavy trucks would not be allowed in the ETL. However, trucks could benefit from improved operation in the general purpose lanes as other vehicles divert to the ETL. If trucks are allowed to use the ETL, it is anticipated that they would pay a rate 150 percent of automobiles.

Operations and maintenance (O&M) costs were estimated in order to derive annual net revenue from gross toll revenue. Both the SR 167 and SR 509 tolls support the entire facility (all vehicles tolled) while the I-5 ETL toll support the ETL elements of I-5. The I-5 revenue stream shows a 2x coverage potential. This shows the potential to fund non-ETL elements on I-5 such as pavement rehabilitation and transit facilities.

2.1.3 Second Design Workshop Initial Investment Levels

The Initial Design Workshop alternatives were screened and combined into a set of investment levels for evaluation by workshop participants. These were the starting points for refinement into an initial phase of construction and a future investment phase. Table D- 1 shows three investment levels. Investment Level 1 represents the baseline project alternatives: Option C for the I-5/SR 509 corridor; SR 167 Phase 1 from the 2012 tolling study (WSDOT 2013); and an I-5 ETL concept with an HOV to HOT lane conversion between SR 16 and I-90, and a second ETL between SR 167 and SR 509. The costs are year of expenditure in 2011 dollars (millions). The Level 1 cost of over $2 billion exceeded to Gateway Project objective of a $1.8 billion investment.

Investment Level 2 incorporated ideas developed in the Initial Design Workshop and refined before the Second Design Workshop. For SR 509/I-5, the Option C was refined to reduce cost, but maintain the functionality of Option C. The cost reductions of the SR 167 baseline project

[2] Mesoscopic models provide more detail and better accuracy in forecasting future traffic and intersection delay on study area local arterials than macroscopic models. The SR 167 Comprehensive Tolling Study used the Dynamic Traffic Assignment (DTA) mesoscopic model for the SR 167 corridor for the morning, mid-day and evening peak traffic periods.

[3] SR 167 revenue is for the 2020 through 2058. SR 509 revenue is for the 2020 through 2059 period.

were primarily achieved by replacing the I-5 freeway to freeway system interchange with a lower cost, service-type interchange with traffic signals. Costs were reduced on the I-5 ETL project by deferring the construction of a second ETL between SR 167 and SR 509 until a future phase.

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Table D- 1 Investment Level Development for Traffic and Revenue Evaluation

Investment Level	Project Area								
	SR 509/I-5			SR 167			I-5 ETL		
	Name(1)	ROM Range(2)	Advantages/Disadvantages	Name(1)	ROM Range(2)	Advantages/Disadvantages	Name(1)	ROM Range(3)	Advantages/Disadvantages
1 (BASE)	**Option C** • One lane on SR 509 each direction between S 188 St and I-5 • Auxiliary on SR 509 each direction between 24th/28th Ave S and I-5 • New Diamond Interchange at S 188 St and SR 509 • Half-Diamond to/from east at 24th/28th Ave S • Free-flow, directional interchange to/from south at I-5/SR 509 • ETL Direct Connections between I-5 Median and SR 509 • New Connection to S 231st Way via new I-5 Collector Distributor system • Reconstruct SR 516 Interchange to include new I-5 Collector Distributor system	$820	Advantages • Provides median Direct Connector to two-lane I-5 ETL from SR 509 • Provides GP connection at I-5 for freight connectivity to SR 509 Corridor and South Seattle industrial area • Constructs 24th/28th Interchange connection to City of SeaTac, Sound Transit South Link Station and Port of Seattle air cargo • Adds connection to S. 231st St, and Kent valley • Compatible with Full Build • Provides direct connection to I-5 ETL system from SR 509 • Compatible with either ETL investment level • Supports Disadvantages • High initial investment	**Phase 1** • Widen I-5 for center piers • Replace Porter Way bridge • One lane on SR 167 each direction from SR 161 to SR 509 • Auxiliary lanes both directions on SR 167 from I-5 to 54th Ave E Interchange • Half- Single Point Urban Interchange to/from east at 54th Ave E • Free-flow, directional interchange at I-5/SR 167 • Valley Ave E Interchange • Single Point Urban Interchange at Meridian Ave • Reconstruct 70th Ave E from 20th St E to SR 99	$963	Advantages • Improved access to the Port of Tacoma and SR 509 via SR 167 extension and new 54th interchange • Compatible with Full build • Connection to Fife industrial area via Valley Ave Interchange • Highway connection on SR 167 from SR 161 to I-5 • Reduced freight traffic at I-5/54th Ave interchange • Reconstructed 70th Ave E from 20th to SR 99, extending the improvements currently under construction • Key SR 167/I-5 ramps, providing freight mobility without using local interchanges Disadvantages • High initial investment • Does not provide direct connection to I-5 ETL system	HOV Lane Conversion, SR 16 to I-90 with two-lane ETL from SR 167 to SR 509 • Convert existing HOV lane to an express toll lane from SR 16 to I-90 • Add one new lane, creating two-lane ETL system from SR 167 to SR 509 • Tolling system, signing and pavement marking • Replace S 320th St, S 216th St, Military Rd Bridges • Widen S 336th St NB, S 288th St (NB), Military Rd (NB/SB), S 260th St (NB/SB), SR 516 (NB/SB), S 188th St (NB/SB) bridges	$274	Advantages • Added capacity for GP and light freight traffic with new Express Toll Lane • Better system management through added tolling system • Anticipated increase in GP and freight mobility due to added lane. Disadvantages • High initial investment
2	**Option C w/ Design Refinements** • One lane on SR 509 each direction between S 188 St and I-5 • Auxiliary on SR 509 each direction between 24th/28th Ave S and I-5 • New Diamond Interchange at S 188 St and SR 509 • Half-Diamond to/from east at 24th/28th Ave S • Free-flow, directional interchange to/from south at I-5/SR 509 • ETL Direct Connections between I-5 Median and SR 509 • New Connection to S 231st Way via new I-5 Collector Distributor system • Reconstruct SR 516 Interchange to include new I-5 Collector Distributor system .	$673-$785	Advantages • Provides median Direct Connector to two-lane I-5 ETL from SR 509 • Provides GP connection at I-5 for freight connectivity to SR 509 Corridor and South Seattle industrial area • Constructs 24th/28th Interchange connection to City of Sea Tac, Sound Transit South Link Station and Port of Seattle air cargo • Adds connection to S. 231st St, and Kent valley • Compatible with Full Build • Provides direct connection to I-5 ETL system from SR 509 • Median ETL ramp could serve as end/begin point of second ETL lane Disadvantages • Non-standard roadway sections will be in-place until future widening	**Phase 1, Signal Controlled Interchange at I-5 w/ Design Refinements** • Widen I-5 for center piers • Replace Porter Way bridge • One lane on SR 167 each direction from SR 161 to SR 509 • Auxiliary lane on SR 167 from I-5 to 54th Ave E Interchange • Half-Single Point Urban Interchange to/from east at 54th Ave E • Signal controlled Interchange at I-5/SR 167 Interchange • Valley Ave E Interchange • Single Point Urban Interchange at Meridian Ave • Reconstruct 70th Ave E from 20th St E to SR 99	$701-$818	Advantages • Improved access to the Port of Tacoma and SR 509 via SR 167 extension and new 54th interchange • Connection to Fife industrial area via Valley Ave Interchange • Highway connection on SR 167 from SR 512 to I-5 • Reduced freight traffic at I-5/54th Ave interchange • Reconstructed 70th Ave E from 20th to SR 99, extending the improvements currently under construction • Interchange at I-5/SR 167 to provide for all traffic movements Disadvantages • Signal controlled interchange at I-5/SR 167 interchange • Non-standard roadway sections will be in-place until future widening • Does not provide direct connection to I-5 ETL system	**HOV Lane Conversion, SR 16 to I-90** • Convert existing HOV lane to an express toll lane from SR 16 to I-5 Reversible Roadway • Tolling system, signing and pavement marking	$111	Advantages • Better system management through added tolling system • Anticipated increase in GP and freight mobility with access to express toll lane. • Provides toll system infrastructure for future express toll lane system expansion Disadvantages • Non-standard roadway sections will be in-place until future widening • Limited mobility improvement without second express toll lane

NOTES:
1. Name from Initial Design Workshop Summary (HNTB, January 2013).
2. ROM=rough order of magnitude cost including construction, right of way, preliminary engineering, risk, and inflation to YOE in millions of dollars.
3. ROM estimate for I-5 ETL includes construction and preliminary engineering, but does not include right of way, risk or inflation. Basis of estimate is 2011.

Investment Level	Project Area								
	SR 509/I-5			SR 167			I-5 ETL		
	Name(1)	ROM Range(2)	Advantages/Disadvantages	Name(1)	ROM Range(2)	Advantages/Disadvantages	Name(1)	ROM Range(3)	Advantages/Disadvantages
3	**509-4, Defer construction of the I-5/SR 509 ETL Direct Connectors** • One lane on SR 509 each direction between S 188 St and I-5 • Auxiliary on SR 509 each direction between 24th/28th Ave S and I-5 • New Diamond Interchange at S 188 St and SR 509 • Half-Diamond to/from east at 24th/28th Ave S • Free-flow directional interchange to/from south at I-5/SR 509 • New Connection to S 231st Way via new I-5 Collector Distributor system • Reconstruct SR 516 Interchange to include new I-5 Collector Distributor system	$621-$725	Advantages • Provides GP connection at I-5 for freight connectivity to SR 509 Corridor and South Seattle industrial area • Constructs 24th/28th Interchange connection to City of Sea Tac, Sound Transit South Link Station and Port of Seattle air cargo • Add Connection to S. 231st St, and Kent valley • Compatible with Full Build Disadvantages • Doesn't provides median Direct Connector to I-5 ETL from SR 509	**167-2, Delay construction of 167 between Valley & SR 161** • One lane on SR 167 each direction from Valley Ave E to SR 509 • Auxiliary lanes both directions on SR 167 from I-5 to 54th Ave E Interchange • Half- Single Point Urban Interchange to/from east at 54th Ave E • Free-flow, directional interchange at I-5/SR 167 • Reconstruct 70th Ave E from 20th St E to SR 99 • Half-Diamond to/from north at Valley Ave E Interchange • SR 167 Overcrossing at Meridian Ave to new surface street connector • Similar to Phase 1-c of Comprehensive Tolling Study	$651-$759	Advantages • Improved access to the Port of Tacoma and SR 509 via SR 167 extension and new 54th interchange • Compatible with Full build • Connection to Fife industrial area via Valley Ave Interchange • Highway connection from Valley Ave to I-5 • Reduced freight traffic at I-5/54th Ave interchange • Reconstructed 70th Ave E from 20th to SR 99, extending the improvements currently under construction • Key SR 167/I-5 ramps, providing freight mobility without using local interchanges Disadvantages • Defers completion of SR 167 to future construction • Utilizes local road system to complete SR 167 • Does not provide direct connection to I-5 ETL system	(cell not used)	(cell not used)	(cell not used)

NOTES:
1. Name from Initial Design Workshop Summary (HNTB, January 2013).
2. ROM=rough order of magnitude cost including construction, right of way, preliminary engineering, risk, and inflation to YOE in millions of dollars.
3. ROM estimate for I-5 ETL includes construction and preliminary engineering, but does not include right of way, risk or inflation. Basis of estimate is 2011.

Investment Level 3 represented further scope reductions to reduce costs. For SR 509/I-5, the I 5 median connection to the express toll lanes was dropped. SR 167 delayed the construction of the freeway section between Valley Avenue E and SR 161/N Meridian Avenue.

2.2 Afternoon Workshop (3/12/2013)

The afternoon workshop session focused on review and refinement of the Investment Level 2 options. Issues included:

Stakeholder the concerns with the two-lane segments – Traffic modeling for tolled operation shows one-lane in each direction will be adequate through 2030 and likely beyond. Forecasts for tolled 2020 and 2030 volumes are one-third and one-half capacity, respectively. However, the macroscopic modeling, does not address the effects of heavy truck traffic on grades or where lane changes are required. On SR 509, the effect of the steep grade must be considered where trucks are climbing up from Des Moines Creek to I-5 to the south and S 188th Street to the north.

Design standards – Is deviation from full freeway standards possible? Where should this be considered?

SR 167/I-5 system interchange – There is a high initial cost to build high-speed freeway to freeway connections at this location due to long structures with deep foundations. What is the best configuration for initial construction of a service type interchange with signal controlled ramp intersections? What configuration will minimize later throw-away construction in a later phase?

Cross section arrangements – What are the configuration alternatives to provide two-lane, two-way traffic, with any auxiliary lane needed in one earthwork prism of the ultimate six-lane FEIS configurations of either SR 167 or SR 509?

For the two-lane versus four-lane issue, the workshop began identify segments where auxiliary lanes may be beneficial. These would be subject to further operational analysis in Gateway Project design development. It was generally thought that where an auxiliary lane was needed, it would be in one direction only resulting in a three-lane section, with barrier separation of the two lanes uphill and one lane downhill, and varying widths of the inside and outside shoulders. Hard shoulder running (HSR) was also discussed as an option to accommodate a slow vehicle turn out/truck lane in the initial phase. With median barrier separation, 30 feet of pavement width could accommodate a 4-foot inside shoulder, 12-foot travel lane and a 14-foot full pavement depth outside shoulder allowing HSR operation. Other cross section configurations were discussed.

Several issues were raised that should be evaluated during selection of a cross section for the initial phase:

- All water quality in median?
- Stopping sight distances with barriers and walls?
- Location of crown points
- Retaining wall location of interim versus ultimate (more of a concern on SR 509)

- Forward compatible to 6 lanes versus 4 lanes
- Wider outside shoulder versus wider inside shoulder
- Gutter flow/ponding on inside shoulder
- Traffic control for future expansion

2.2.1 Cost Estimates

The workshop discussion of cost estimates included an overview of the development of estimates for the baseline projects for SR 167 and SR 509, and the limited cost estimate data available from the I-5 Express Toll Lanes Pre-design Study. Issues identified included:

Schedule risk items – How should cost risk of an extended schedule be captured? If a contractor's equipment costs represents 20 to 25 percent of the project cost, significant schedule delay drives up cost. WSDOT is currently using 2.5 percent per year cost escalation. Is this sufficient to cover schedule risk?

Design development contingency – Both SR 167 and SR 509 captured design development risk in the Cost Estimate Validation Process (CEVP). SR 167 and SR 509 had CEVP risk of 4.5 and 12 percent, respectively.

Estimate multipliers – The estimate multipliers that have been used are typically of design-bid-build (D-B-B). Both construction engineering (CE) and preliminary engineering (PE) are reduced for design-build (D-B) project delivery with balances applied to the design-builder cost.

Sale tax (9.5%) assumptions – Look at how this is applied to the project.

Bridge structure costs – Bridge costs are on a per square foot basis and have been verified. Some projects have found these to be high. Foundation cost will likely be the biggest variable. Bridge types will be reviewed to determine if lower cost types may be used. For example, bridges and foundations are 50 percent of the cost for SR 167 Area 3.

Utilities – Consider if early relocation of major utilities is possible to reduce contractor risk if D-B project delivery is used.

2.2.2 Design Options Summary

Table D- 2 summarizes design options considered by workshop participants. Some of the items were ranked on a three-level scale with "A" considered most promising and "C" least promising for further, post-workshop evaluation.

Table D- 2 Second Design Workshop Day 1 Summary

Rank	Item	Description
A	1.	Typical Section Options Reduced shoulder pavement with stabilized recovery area SR 167 segments SR 509 to I-5 = 4 lanes I-5 to Valley = 4 lanes Valley to SR 161 = 2 lanes
B	2.	Trade-off interchange completion versus 4 lanes Valley interchange south half deferred SR 161 north half deferred
B	3.	Valley interchange refinements roundabout split into two half diamonds Valley from north/west Freeman from south/east
A	4.	3-lane sections Loaded trucks mostly out of Port Climbing lane concept Thru-T concept for half-diamond at I-5
A	5.	Bridge/Constraints at wider initial (60') to allow interim 4-lane operations Off structures use reduced sections per #1.
C.	6.	Advance work Geotechnical/embankments → example, advance pre-loads on SR 167 Utility relocations Right of way acquisition
	7.	Cost estimate Foundation investigation/cost refinement
	8.	Program Complex/high-risk items done early (versus by geographic region)

2.2.3 Delivery/Finance/Revenue Summary

Workshop attendees reviewed alternative project delivery methods and their applicability to the Gateway Project:

- Design-Build
- Design-Build Fixed Price/Best Design
- Public-Private partnership may not be not as suitable given political and revenue estimates
- Design-Build Finance – contractor provides "bridging" incremental funding for total program—for example, $300 million out of $1.8 billion ($1.1 billion gas tax + $400 million toll revenue = $300 million gap)

White papers are being prepared to present Design-Build Finance and Design-Build Fixed Price/Best Design to describe the options and applicability.

Project construction phasing will be developed to match available revenue streams. For example, about 60 percent of the I-5 ETL revenue is expected from the initial HOV to ETL conversion

which will have lower implementation costs than adding the second ETL between SR 167 and SR 509. The widening required new pavement and bridge replacement.

3. DAY 2 (MARCH 13, 2103)

The second day of the workshop was used to summarize the discussions of Day 1, set the direction of further development of Gateway Project elements for the final report, and prepare for the post-workshop stakeholder meeting.

3.1 Overview of Funding Level and Traffic Demands

Based on transportation funding package under consideration in March 2013 by the state legislature, $1.8 billion is current cost ceiling for Gateway Project Phase 1. Traffic modeling has shown that a basic two-lane section is adequate for the tolled SR 167 and SR 509 extensions, with auxiliary lanes needed in some segments. It would likely be 10 to 15 years before widening is needed to meet additional demand. If demand were higher, higher toll revenue could be available to apply to widening.

3.1.1 SR 509

In previous project development, the SR 509 Executive Corridor Committee endorsed Option C which includes one lane in each direction on SR 509. Two of the key stakeholder elements, identified as part of the initial phase of SR 509, are the 28th/24th Avenue South interchange and the Kent valley connection at S 231st Way.

Truck climbing lanes are needed uphill from Des Moines Creek to the 28th/24th Avenues South interchange and should be evaluated for northbound SR 509. Gateway Phase 1 will be constructed on the northbound roadway prism of the full (FEIS) SR 509 project. Truck climbing lanes could be provided in combination with hard-shoulder running on a 14-foot wide outside shoulder in the uphill direction along with a 12-foot travel lane and 4-foot inside shoulder. With a 2-foot wide barrier, the downhill direction would have a 4-foot inside shoulder, 12-foot travel lane, and 8-foot outside shoulder. Total cross section width would be 56 feet.

3.1.2 SR 167

The SR 167 project is comprised of five areas. Workshop recommendations for each area were:

Area 1, SR 509 to 54th Avenue East – This segment remains unchanged from the baseline project with one lane in each direction.

Area 2, 54th Avenue East to I-5 interchange – This segment has a relatively low volume, but a high truck percentage with Port of Tacoma traffic. This segment has one through lane in each direction plus one truck auxiliary lane in each direction.

Area 3, I-5 interchange – Provide a free-flow I-5 southbound to westbound right turn for Port-destined traffic. Cross I-5 on the ultimate southbound structure. Evaluate a SR 167 northbound “thru-T” without intersections. Evaluate median direct connector for the I-5 express toll lanes.

Area 4, I-5 to Valley Avenue East – Build on the ultimate northbound alignment for SR 167 (FEIS). Consider the need for auxiliary lanes in this segment. These could be provided with hard-shoulder running on 14-foot wide shoulders in traffic peak periods. Inside shoulder widths should be varied to maintain adequate sight distance around median barrier through curves.

Area 5, Valley Avenue E to SR 512 – Baseline configuration of one lane in each direction between Valley Avenue East and SR 161 is adequate. Reduce cost at the Valley Avenue East interchange by using a split diamond with ramps to and from the east at Freeman Road East.

4. NEXT STEPS

The Second Design Workshop led to the development of a refined Investment Level 2 project, identified as Investment Level 2.5 and leading to the Gateway Phase 1 project definition. This project and future phases were presented to stakeholders at a March 15, 2013 meeting and in later presentations.

See Appendix O, Stakeholder Meeting and Agenda, for the materials presented to the stakeholders.

5. REFERENCES

Washington State Department of Transportation (WSDOT) 2013. SR 167 Corridor Completion Comprehensive Tolling Study Final Report. URL: http://www.wsdot.wa.gov/NR/rdonlyres/C8824B42-B63F-4256-BC3E-A5A0316063B2/0/SR167_CorridorCompletion_TollStudy_Web_Final_020613.pdf (accessed July 15, 2013). February.

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APPENDIX D.1 – SECOND DESIGN WORK SHOP AGENDA

HNTB Corporation
The HNTB Companies
Engineers Architects Planners

600, 108th Ave NE
Suite 900
Bellevue, WA 98004

Telephone (425) 455-3555
Fax (425) 453-9179
www.hntb.com

Project Name
Puget Sound Gateway Corridor

Date of Meeting
03/~~11~~12/13-3/~~12~~13/13

HNTB

Location
HNTB
600 – 108th Ave NE, Suite 900
Bellevue, WA 98004

Time
(see below)

Purpose of Meeting
Puget Sound Gateway Corridor Workshop

Participants
(see attendee list)

MEETING AGENDA

DAY 1

Opening Remarks (9:00-9:30am)
- Introduction (Dan D.)
- Context and Expectations (John W.)
  - Legislative update

Progress update (9:30am-12:00pm, about 25 minutes each)
- Design updates (Dan H.)
- Estimate updates/Investment levels (Dan H.)
- Traffic – modeling (Jana)
- Tolling and Revenue Output (Brent B./Scott L.)
- Finance and cash flow projections (John W.)

Lunch (12:00-1:00pm) – on your own

Workshop Group Breakout Discussion (1:00-4:00pm)
- Group 1: Design, Construction, and Estimate Optimizations
- Group 2: Alternative Delivery and Financing Options

Summary Discussion to bring ideas back together (4:00-5:00pm)

DAY 2

Summary Discussion (9:00am-11:30am)
- Shortlist of ideas from Day 1
- Packaging options
- Cash flow effects
- Contracting delivery options, needs, and impacts
- Risks and Opportunities

Wrap-up/Next Steps (11:30am-12:00pm) – End of regular workshop

Lunch (12:00-1:00pm) – on your own

Follow-on Discussion (1:00-5:00pm)
- *As requested or scheduled during workshop*

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WSDOT Agreement: Y10956

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APPENDIX D.2 – WORKSHOP ATTENDEE SIGN-IN SHEETS

(1)

HNTB

MEETING SIGN-IN SHEET

Project: SR509 / I-5 / SR167 | Meeting Date: 3/12 & 3/13

Facilitator: Dan D, Mark U. | Place/Room: HNTB, Conf. Rm 1.

Name	Title	Company	Phone	Fax	E-Mail
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