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The conceptual finance plan below shows a range of CRC Project cost estimates based on the proposed project refinement recommendations and the latest results of the Cost Estimate Validation Process (CEVP). Costs and revenues are shown in year-of-expenditure dollars. The finance plan is preliminary; refinements are in process based on the recent results from the toll sensitivity, CEVP, and other analyses. The finance plan may be adjusted based on legislative, DOT, FHWA/FTA, public, and PSC reviews.

Preliminary Finance Plan Scenarios
In Billions of Year-of-Expenditure Dollars

		60% Probability	90% Probability
Cost			
	Highway	$2.40	$2.65
	Transit	$0.79	$0.89
	Total	$3.19	$3.54
Revenues			
Tolls		$1.15-$1.29	$1.25-$1.49
ODOT and WSDOT		$0.75-$0.85	$0.90-$1.00
Federal		$1.15-$1.19	$1.15-$1.39
	Highway	*$0.40*	*$0.40*
	Transit (New Starts)	*$0.75-$0.79*	*$0.75-$0.89*
	Total	$3.19	$3.54

The plan calls for securing $400 million in Projects of National and Regional Significance funding from the upcoming federal transportation reauthorization act. While the toll rate structure for the CRC Project will not be established until after tolling is authorized by the Washington legislature, the range of financial capacity from tolls that are shown above are based on the Tolling Study Committee analysis, which found a variety of rate structures capable of providing the amounts shown; no specific toll rate structure is assumed in the finance plan. The amount shown for the DOTs is subject to an intergovernmental agreement between the DOTs allocating cost responsibility and legislative approvals of the required funding, and could vary depending on final disposition of other elements of the finance plan. The New Starts funding presumes the recent statutory language secured by Senator Murray, and requires FTA approval of a Full Funding Grant Agreement based on the New Start rating regulations.

Appendix C – CRC Tolling Study Committee Report
Travel Demand Forecasting, Revenue Projections, Determination of Net Revenues, and Financial Capacity Analysis

Travel Demand Forecasting

Regional travel demand models are used to forecast how people may choose to travel in the future given projected growth patterns for population and employment as well as future transportation facilities. The Portland-Vancouver area regional travel demand model used for the Columbia River Crossing (CRC) project was developed jointly by the Portland-area Metro Regional Government (Metro) and the Southwest Washington Regional Transportation Council (RTC). The model, run by Metro and peer-reviewed by a national panel of experts in October 2008, applies a four-step process in estimating future travel demands:

Step 1: Person-trips are estimated from adopted regional growth projections and adopted regional transportation plans. Growth projections include population and employment forecasts throughout the metropolitan region. Transportation plans include future transportation facilities, including roadways, transitways, and bicycle and pedestrian facilities.

Step 2: Predicted person-trips are then distributed to zones across the metropolitan region. Over 25,000 network routes, or "links," are used in the model, as well as over 2,000 transportation analysis "zones." The model predicts how many people will want to travel from one zone to another via different links.

Step 3: Person-trips between each of the zones are broken down by mode of travel (drive alone, carpool, transit, bicycle, walking) based on each option's attractiveness when considering travel time and cost, as well as each traveler's socioeconomic characteristics. Travel costs include parking fees, transit fares, tolls, and automobile operating costs.

Step 4: The model assigns each trip to a specific routing in the model's network. For the CRC's tolling analysis work, the model predicts how many people are projected to cross the Columbia River on I-5 and I-205 via automobile and transit. The model is used to predict weekday peak period vehicle volumes across each bridge, which are later used to develop daily traffic demands.

The regional travel demand model is appropriate for comparing the relative weekday effects of travel across the Columbia River for different tolling scenarios. The model used for tolling analysis purposes allows relative generalizations to be made about I-5 and I-205, including vehicle and transit trips, and the duration of vehicular congestion experienced along each river crossing.

Daily and hourly traffic volumes in 2030 would vary for the I-5 bridge and the I-205 bridge with different tolling levels. Based on information included in the model regarding how much people value their time for different types of trips, lowering or raising toll rates affects how many people choose to pay the specific toll, divert to the alternative bridge, travel during another time of the day, take transit, or travel to a different destination altogether. The scenario analysis found:

- For most of the I-5 only toll scenarios, the majority of drivers would not change their travel patterns. Some would choose a new destination or a non-tolled route. Diversion to transit is minimal due to the already increased ridership associated with project improvements.

- Route diversion tends to increase as toll rates increase; however, the percentage of diversion tends to be lower during peak periods when travelers' willingness to pay tolls may be higher and/or alternative routes are congested, and thus, time consuming.

- For scenarios that toll both the I-5 and I-205 bridges, traffic levels would be higher on I-5 and lower on I-205 compared to tolling only the I-5 bridge. However, compared to the No Toll project scenario, total cross-river traffic demand would be less on both the I-5 and I-205 bridges as many trips would divert to transit or not be made across the Columbia River.

See the attached spreadsheet titled *Traffic Effects for Tolling Scenarios* for more detailed information about traffic diversion, average daily traffic volumes and hours of congestion predicted for each of the tolling scenarios.

Additional work refining one or two likely scenarios will be undertaken to inform financial planning and final rate setting prior to issuing toll revenue bonds. That analysis would independently review and refine many key assumptions, including land use projections, and also examine parts of the network beyond the I-5 and I-205 river crossings, such as key interchanges with these highways, and critical roadways and intersections. An updated and detailed toll traffic and revenue report is warranted before issuing debt, and would be required by the credit rating agencies if any of the bonds were to be backed solely by toll revenues.

Revenue Projections

The annual traffic and revenue projections produced for the CRC project are derived from outputs of the Metro regional travel demand model. The Metro model employs inputs for users' values of time as a surrogate for the relationship of time and cost reflecting the potential toll on the I-5 bridge crossing. The regional model was further supplemented by the development of a corridor level traffic model (VISSIM) which provided traffic operation capabilities to estimate the effect of future congestion in the corridor. This became the basis for "post-processing" the model results to refine traffic demand projections. The traffic and revenue projections show both the annualization of the direct Metro model results and the refined post-processed results, the latter of which bracket the mid-range of anticipated traffic and revenue impacts.

Ten toll scenarios that vary toll rates and toll locations (I-5 only or both I-5 and I-205 bridges) were developed by the CRC team for analysis, in conjunction with the Oregon and Washington departments of transportation. Toll rates were assumed to vary by time of day according to a fixed schedule that applies higher toll rates in peak periods and lower rates during off-peak times when demand is less. Toll rates were originally specified in constant year 2006 dollars in the project's Draft Environmental Impact Statement (EIS); however the actual tolls paid are assumed to increase with expected inflation, projected at 2.5 percent per year. See Exhibit 1 for information about each scenario.

It is expected that the toll collection will be all-electronic, which allows tolls to be collected without toll booths causing drivers to slow down to pay tolls. Thus, drivers would either have a transponder, paying the rates noted in Exhibit 1, or the vehicle would be identified via the license plate, in which case a $1.00 “pay-by-plate” processing fee would be added to each transaction. For example, a vehicle traveling during the peak period (6 am to 10 am) without a transponder would be charged $2.00 plus the $1.00 processing fee, or $3.00 for their trip in one direction.

Exhibit 1. Tolling Scenarios Evaluated

	Scenarios Analyzed	Min/Max Toll Rate (2006$)	Min/Max Toll Rate (2018$)	Tolls Collected	Toll Schedule Type	Tolling Start Date
Tolling I-5 Only	**Scenario 1A** *DEIS Toll Rate*	$1.00 / $2.00	$1.34 / $2.69	Each Way	Symmetric Variable Toll Schedule	July 1, 2018 (FY 2019)
	Scenario 1B *Lower than DEIS Toll Rate*	$1.00 / $1.50	$1.34 / $2.02			
	Scenario 1C *Flat Toll Rate*	$1.65	$2.22		Symmetric Fixed Toll Schedule	
	Scenario 1D *Additional Price Points*	$1.00 / $2.50	$1.34 / $3.36		Symmetric Variable Toll Schedule	
	Scenario 1E *1.5x DEIS Toll Rate*	$1.50 / $3.00	$2.02 / $4.03			
	Scenario 1F *2x DEIS Toll Rate*	$2.00 / $4.00	$2.69 / $5.38			
	Scenario 1G *3x DEIS Toll Rate*	$3.00 / $6.00	$4.03 / $8.07			
	Pre-Completion Tolling[1] *DEIS Toll Rate*	$1.00 / $2.00	$1.34 / $2.69	Each Way	Symmetric Variable Toll Schedule	July 1, 2013 (FY 2014)
Tolling I-5 and I-205	**Scenario 2A** *DEIS Toll Rate*	$2.00 / $4.00	$2.69 / $5.38	Southbound Only[2]	Symmetric Variable Toll Schedule	July 1, 2018 (FY 2019)
	Scenario 2B *Lower than DEIS Toll Rate*	$2.00 / $3.00	$2.69 / $4.03			
	Scenario 2C *Lower I-205 Toll*	I-5: $2.00 / $4.00 I-205: $2.00 / $3.00	I-5: $2.69 / $5.38 I-205: $2.69 / $4.03			

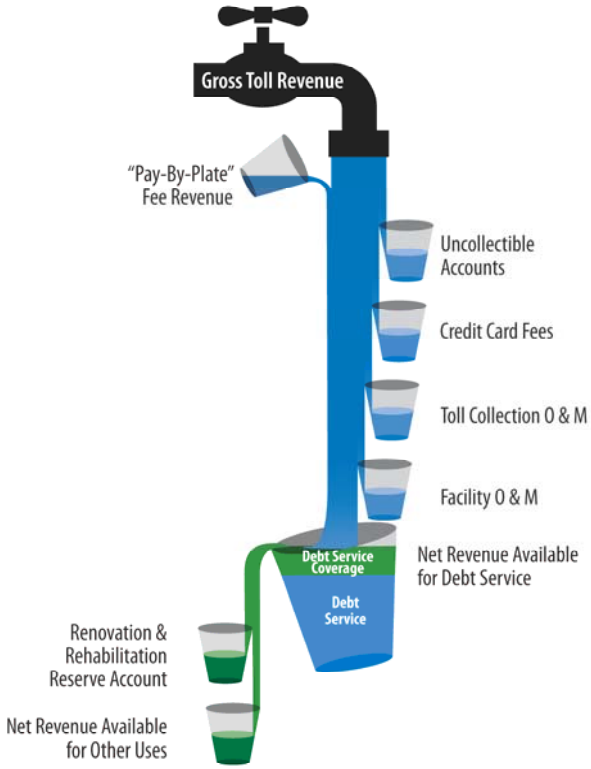
[1] Pre-Completion Tolling to be added to any other scenario

[2] A round-trip toll is collected on scenarios tolling Southbound only

The rates for commercial vehicles are assumed to be proportionately greater than passenger cars, roughly as a function of the number of axles for a commercial vehicle. For the purposes of this analysis, it is assumed that commercial vehicles will pay on an N minus one basis based upon axles, that is, a five-axle truck would pay four times the passenger car rate (five minus one times the passenger rate). Model volumes were provided for medium (three-axle) and large (five-axle) trucks. The exact commercial toll schedule will be a function of the future development of the electronic toll collection system. Toll schedules assumed for each scenario are shown on the attached spreadsheets, *Toll Rate Schedules for I-5 Scenarios* and *Toll Rate Schedules for I-5 and I-205 Scenarios*.

Determination of Net Revenues

To arrive at the portion of revenues available to support financing via the repayment of debt, several deductions must be made from gross toll revenues and fees. Key among these deductions is the obligation to pay for toll collection and facility operation and maintenance (O&M) costs for the bridge and roadway. The deductions from gross revenues include the following:



- Potential toll revenue lost due to uncollectable accounts
- Credit card and banking fees associated with toll payment and accounts
- Toll collection operations and maintenance costs, including maintenance, periodic replacement of equipment, back office costs and bridge insurance
- Routine operations and maintenance of the bridge and roadway facilities

Facility O&M costs include routine maintenance of the bridge and all roadways within the project area as well as incident response for the project area. After gross revenues have paid all of the above deductions, including toll collection and facility O&M costs, the remaining net revenue is available for debt repayment.

The net revenue stream represents the cash flow that can be used directly for financing to repay bonds, or to directly pay for construction if pre-completion tolling is implemented. In addition to bond repayment, there will be a periodic need for renovation and rehabilitation activities for the project. These costs are assumed to be funded out of excess net revenues after annual debt repayments that result from the debt service coverage requirement placed on net revenues. A reserve account may be created that would be funded from these excess net toll revenues.

Financial Capacity Analysis

Tolling the I-5 bridge does not have the financial capacity to yield a funding contribution equal to the $2.38 billion cost in year of expenditure dollars for the highway portion of the project. Rather, a number of funding sources will likely be needed to build the project, including federal and state (Oregon and Washington) funding sources combined with funding from tolls.

For the purposes of this analysis, the bridge is assumed to be substantially completed by the end of fiscal year 2018, with revenue operations beginning on July 1, 2018 (state fiscal year 2019). Toll bond proceeds are assumed to be received in the middle and latter years of construction to maximize their funding contribution, and other funding

sources are assumed to cover construction costs in the initial years. Other project improvements to the highway and interchanges would continue into 2019, and the last bonds needed to fund these completion activities are assumed to be issued after tolling has commenced.

The CRC toll bonds were assumed to be backed by other revenue sources, and the full faith and credit of one or both states to provide the bonds with a credit rating and interest costs equivalent to that of general obligation debt of either state.

The use of toll bonds will increase the total costs paid during and after construction due to the added interest and issuance costs. However, these financing costs are treated separately from the project capital cost during construction. Increased use of toll bonds will increase the total costs paid due to added interest and issuance. The construction cost does not increase as a result; rather it adds a financing cost both during and after construction.

State-backed bonds are limited by Washington State Constitution to a 30 year repayment period. Accordingly, debt with the maturity of up to 30 years was assumed to maximize the total proceeds that can be generated by the forecasted net toll revenue stream.

A minimum debt service coverage factor of 1.25 was assumed for state-backed debt whereby net toll revenues were maintained at 1.25 times the projected annual debt service. The intent of this is to provide some protection against draws on the revenue sources pledged to backup toll revenues, such as motor vehicle fuel tax revenues, in the event of lower-than-projected toll revenue performance.

Interest rates on state-backed bonds are assumed to be 6.00 percent for current interest bonds ("CIBs") and 6.50 percent for capital appreciation bonds ("CABs"), based on the current double-A credit ratings in both states. Issuance costs are assumed to be 0.2 percent of the total par amount of bonds issues for state-backed bonds. Additional costs would include 0.5 percent of the par amount for current interest bonds for underwriting (underwriter's discount) and 1.0 percent of the par amount for capital appreciation bonds.

Interest is assumed to be capitalized through the year before the project completion date, or up to two years after full toll collection commences. Earnings on invested funds (construction fund and capitalized interest fund) are assumed to be at an annual rate of 2.50 percent. While this might be higher than current yields on short-term investments, it is substantially less than the assumed future interest cost of borrowing, (between 6.0 and 6.5 percent for state-backed bonds), and thus represents approximately the same level of negative arbitrage currently being experienced by issuers of tax-exempt bonds.

Funding Range

Based on the analysis done for this report, several preliminary conclusions can be reached:

1. Tolling can contribute a significant amount of funding to the project.

2. Tolling cannot be the only funding source for the project. Several funding sources, including state (Oregon and Washington) and federal, will be needed to supplement tolling funds.

3. Toll rates on I-5 can only be raised so high before total revenue and funding decrease. The limit is approximately two times the toll rate studied in the project's Draft EIS.

4. State backing of the debt is necessary to maximize the toll funding contribution. By essentially making the debt equivalent to general obligation bonds, state-backing affords the debt a high credit rating and relatively low interest rates. Non-recourse debt that is backed solely by toll revenues is anticipated to carry a lower or minimum investment-grade credit rating, which would entail higher interest rates, increased capitalized interest costs, and higher debt service coverage requirements.

Further study is warranted as the project design and cost of the project are refined, or as more information is available about other funding sources.

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Traffic Effects for Tolling Scenarios

Scenarios	Average Daily Traffic Volumes			Diversion to I-205 Compared to No Toll Scenario	Average SB I-5 Duration of Congestion	Average NB I-5 Duration of Congestion	Total Average I-5 Duration of Congestion
	I-5 Bridge Total	I-205 Bridge Total	Total River Crossings				
Existing Conditions (2005)	**134,000**	**146,400**	**280,400**	**-**	**2.0 hrs**	**4.0 hrs**	**6.0 hrs**
No Build	**184,000**	**210,000**	**394,000**	**-**	**7.25 hrs**	**7.75 hrs**	**15.0 hrs**
No Toll Scenario	**220,000**	**203,000**	**423,000**	**-**	**5.5 hrs**	**1.5 hrs**	**7.0 hrs**
Scenario 1A	**181,000**	**216,000**	**397,000**	**13,000**	**3.5 hrs**	**1.0 hrs**	**4.5 hrs**
Scenario 1B	**190,000**	**211,000**	**401,000**	**8,000**	**4.0 hrs**	**1.0 hrs**	**5.0 hrs**
Scenario 1C	**175,000**	**215,000**	**390,000**	**12,000**	**3.75 hrs**	**1.0 hrs**	**4.75 hrs**
Scenario 1D	**173,000**	**218,000**	**391,000**	**15,000**	**3.25 hrs**	**1.0 hrs**	**4.25 hrs**
Scenario 1E	**154,000**	**224,000**	**378,000**	**21,000**	**2.75 hrs**	**0.75 hrs**	**3.5 hrs**
Scenario 1F	**133,000**	**231,000**	**364,000**	**28,000**	**2.0 hrs**	**0.5 hrs**	**2.5 hrs**
Scenario 1G	**89,000**	**240,000**	**329,000**	**37,000**	**1.0 hrs**	**0.0 hrs**	**1.0 hrs**
Scenario 2A	**198,000**	**177,000**	**375,000**	**-26,000**	**4.25 hrs**	**1.25 hrs**	**5.5 hrs**
Scenario 2B	**201,000**	**181,000**	**382,000**	**-22,000**	**4.5 hrs**	**1.25 hrs**	**5.75 hrs**
Scenario 2C	**192,000**	**185,000**	**377,000**	**-18,000**	**4.0 hrs**	**1.0 hrs**	**5.0 hrs**

SB = southbound | NB = northbound

Notes

1. Year 2030 results shown, except for Existing Conditions (2005).
2. Average duration of daily congestion levels shown.
3. All results are approximate.
4. The no toll scenario is included for comparison purposes. Tolling is needed to fund the project.

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Toll Rate Schedules for I-5 Toll Scenarios

		No Tolls	Tolling I-5						
			Scenario 1A Draft EIS Variable Toll: Toll structure from the Draft EIS **Raises ~$1.1 - $1.4 billion**	**Scenario 1B** Lower than Draft EIS Toll: Peak period tolls are lower than DEIS **Raises ~0$.9 - $1.2 billion**	**Scenario 1C** Fixed Rate Toll: Same toll all day; rate based on weighted average of Draft EIS variable toll **Raises ~$1.1 - $1.4 billion**	**Scenario 1D** Additional Price Points: Variable toll schedule; rates change more throughout day **Raises ~$1.2 - $1.5 billion**	**Scenario 1E** 1.5X Draft EIS Variable Toll: All tolls are 1.5 times the Draft EIS rates **Raises ~$1.4 - $1.8 billion**	**Scenario 1F** 2x Draft EIS Variable Toll: All tolls are twice the Draft EIS rates **Raises ~$1.6 - $2.1 billion**	**Scenario 1G** 3x Draft EIS Variable Toll: All tolls are triple the Draft EIS rates **Raises ~$1.2 - 2.0 billion**
		Studied for comparison purposes **Raises ~$0**	**One-Way Tolls**	**One-Way Tolls**	**One-Way Tolls**	**One-Way Tolls**	**One-Way Tolls**	**One-Way Tolls**	**One-Way Tolls**
	Time Period		**Collected Both Directions**	**Collected Both Directions**	**Collected Both Directions**	**Collected Both Directions**	**Collected Both Directions**	**Collected Both Directions**	**Collected Both Directions**
2006 Dollars	Midnight to 5 AM		$1.00	$1.00		$1.00	$1.50	$2.00	$3.00
	5 AM to 6 AM		$1.50	$1.25		$1.50	$2.25	$3.00	$4.50
	6 AM to 7 AM					$2.00			
	7 AM to 9 AM		$2.00	$1.50		$2.50	$3.00	$4.00	$6.00
	9 AM to 10 AM					$2.00			
	10 AM to 3 PM		$1.50	$1.25	$1.65	$1.75	$2.25	$3.00	$4.50
	3 PM to 4 PM					$2.00			
	4 PM to 6 PM		$2.00	$1.50		$2.50	$3.00	$4.00	$6.00
	6 PM to 7 PM					$2.00			
	7 PM to 8 PM		$1.50	$1.25		$1.50	$2.25	$3.00	$4.50
	8 PM to midnight		$1.00	$1.00		$1.00	$1.50	$2.00	$3.00
2018 Dollars	Midnight to 5 AM		$1.34	$1.34		$1.34	$2.02	$2.69	$4.04
	5 AM to 6 AM		$2.02	$1.68		$2.02	$3.02	$4.04	$6.05
	6 AM to 7 AM					$2.69			
	7 AM to 9 AM		$2.69	$2.02		$3.36	$4.04	$5.38	$8.07
	9 AM to 10 AM					$2.69			
	10 AM to 3 PM		$2.02	$1.68	$2.21	$3.36	$3.07	$4.04	$6.05
	3 PM to 4 PM					$2.69			
	4 PM to 6 PM		$2.69	$2.02		$3.36	$4.04	$5.38	$8.07
	6 PM to 7 PM					$2.69			
	7 PM to 8 PM		$2.02	$1.68		$2.02	$3.02	$4.04	$6.05
	8 PM to midnight		$1.34	$1.34		$1.34	$2.02	$2.69	$4.04

Notes

1. These are toll rate schedules analyzed for planning and testing purposes. Actual toll rates will depend on a final finance plan and will be determined by the Oregon and Washington state transportation commissions to meet legislative funding direction.

2. Toll funding contribution ranges assume 30-year state-backed debt.

3. No Toll scenario included for comparison purposes. Tolling is needed to fund the project.

4. Assumes medium trucks pay 2x and large trucks pay 4x the auto toll rate using a transponder; administrative fee would be added to process payments not involving a transponder.

5. Tolls are assumed to escalate at 2.5% per year to match the expected rate of inflation.

6. Tolling during construction could be added to any scenario. Rates assumed to match Scenario 1A, except there would be no toll from midnight to 5am. Tolling early could provide about $330 million in additional funds for construction.

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Toll Rate Schedules for I-5 & I-205 Toll Scenarios

		No Tolls	Tolling I-5 and I-205						
		Studied for comparison purposes **Raises ~$0**	**Scenario 2A** Draft EIS Variable Toll on Both Bridges: Draft EIS tolls on both bridges **Raises ~$2.8 - $3.4 billion**		**Scenario 2B** Lower than Draft EIS Toll on Both Bridges: Peak period toll is lower than Draft EIS rate **Raises ~$2.1 - $2.5 billion**		**Scenario 2C** Lower Toll on I-205: Peak period toll is lower on I-205 than I-5; variable rate toll on both bridges **Raises ~$2.4 - $3.0 billion**		
			Roundtrip Tolls		**Roundtrip Tolls**		**Roundtrip Tolls**		
	Time Period		**Northbound**	**Southbound**	**Northbound**	**Southbound**	**Northbound**	**Southbound I-5**	**Southbound I-205**
2006 Dollars	Midnight to 5 AM		No Toll Collected	$2.00	No Toll Collected	$2.00	No Toll Collected	$2.00	$2.00
	5 AM to 6 AM			$3.00		$2.50		$3.00	$2.50
	6 AM to 10 AM			$4.00		$3.00		$4.00	$3.00
	10 AM to 3 PM			$3.00		$2.50		$3.00	$2.50
	3 PM to 7 PM			$4.00		$3.00		$4.00	$3.00
	7 PM to 8 PM			$3.00		$2.50		$3.00	$2.50
	8 PM to midnight			$2.00		$2.00		$2.00	$2.00
2018 Dollars	Midnight to 5 AM		No Toll Collected	$2.69	No Toll Collected	$2.69	No Toll Collected	$2.69	$2.69
	5 AM to 6 AM			$4.04		$3.36		$4.04	$3.36
	6 AM to 10 AM			$5.38		$4.04		$5.38	$4.04
	10 AM to 3 PM			$4.04		$3.36		$4.04	$3.36
	3 PM to 7 PM			$5.38		$4.04		$5.38	$4.04
	7 PM to 8 PM			$4.04		$3.36		$4.04	$3.36
	8 PM to midnight			$2.69		$2.69		$2.69	$2.69

Notes

1. These are toll rate schedules analyzed for planning and testing purposes. Actual toll rates will depend on a final finance plan and will be determined by the Oregon and Washington state transportation commissions to meet legislative funding direction.

2. Toll funding contribution ranges assume 30-year state-backed debt.

3. No Toll scenario included for comparison purposes. Tolling is needed to fund the project.

4. Assumes medium trucks pay 2x and large trucks pay 4x the auto toll rate using a transponder; administrative fee would be added to process payments not involving a transponder.

5. Tolls are assumed to escalate at 2.5% per year to match the expected rate of inflation.

6. Tolling during construction could be added to any scenario. Rates assumed to match Scenario 1A, except there would be no toll from midnight to 5am. Tolling early could provide about $330 million in additional funds for construction.