Washington State
Department of Transportation

# SR 167
# Toll Feasibility Study

Prepared for Governor Chris Gregoire
and the 2010 Washington State Legislature

September 2010

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# 1. Executive Summary

## Background

State Route 167 Extension Project Vicinity Map

Planning for the lower Puyallup Valley section of State Route (SR) 167 began more than 40 years ago when freeway corridors for Interstate 5, SR 167, SR 410 and SR 512 were proposed. By the late 1980s, a four-lane highway from I-405 in Renton to SR 161 in Puyallup was completed. However, completion of the lower Puyallup Valley portion was delayed due to lack of funding.

In 1990, the Federal Highway Administration (FHWA) selected the lower Puyallup Valley portion known as the SR 167 extension, as a pilot project for a two-tiered Environmental Impact Statement (EIS). Tiering allowed the Washington State Department of Transportation (WSDOT) to identify a preferred corridor (Tier I) before moving forward with more detailed analysis of corridor design (Tier II). The Tier I EIS was approved by FHWA in 1999 and the Tier II final EIS was completed in 2006. FHWA signed the Record of Decision (ROD) for the Tier II EIS the following year.

The full scope of the project as defined in the ROD include three lanes in each direction from SR 161 to I-5 (two general purpose lanes and one HOV lane), and two lanes in each direction west of I-5. It includes five interchanges at SR 161, Valley Avenue E., I-5, 54th Avenue E. and SR 509. Truck weigh stations and two park-and-ride lots are also included. The extension fills a critical link missing in the state's highway network. Its completion is expected to:

- Relieve congestion on local roads and other highways by providing new travel options.
- Move freight faster, more safely and more economically. This is especially important in helping the Port of Tacoma remain competitive given the increasingly intense competition from Canada, Mexico and the Panama Canal.
- Improve regional mobility.
- Enhance surface water quality and improve stream habitat feeding into Commencement Bay.

Since the late 1990s, numerous efforts have been made to fund the project's construction through statewide or regional revenue sources. To date, more than $160 million has been secured and/or invested in the project. These funds enabled the completion of 20% of design and about half of the right-of-way acquisition. More than $1.9 billion is still needed to acquire the remaining right-of-way and complete the design and construction.

## Legislative directive

In 2009, the Washington State Legislature directed Washington State Department of Transportation (WSDOT) to determine the feasibility of administering tolls within the SR 167 corridor. Specifically, WSDOT was asked to examine the following:

- The potential for variable tolling to generate revenues for needed transportation facilities within the corridor.
- Maximizing the efficient operation of the corridor.
- Economic considerations for future system investments.

The Legislature directed WSDOT to report the study findings to the Washington State Transportation Commission (WSTC) periodically throughout the study process and to report the final findings to the Joint Transportation Committee (JTC) by Sept. 30, 2010.

## Options studied

WSDOT worked closely with stakeholders from affected cities and jurisdictions, the Puget Sound Regional Council, and the FHWA to evaluate six different combinations of construction and tolling options. See Sections 5 and 6 of the report for detailed descriptions of these options.

For each option, the study estimated the amount of funding needed for construction, revenue generated through tolling, remaining funding gap, and effects on traffic under various tolling configurations.

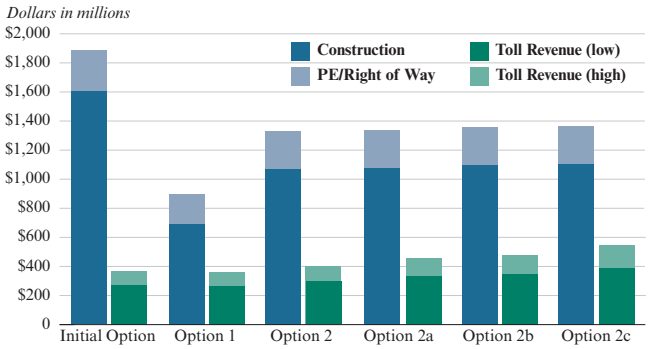
## Summary of findings

- Expected Toll Revenue
  - Tolling is expected to generate a significant amount of revenue to fund the project's construction, ranging from about 17% of the initial study option to about 50% of option 1 – constructing one lane in each direction from I-5 to SR 161.
  - The bonding capacity of the toll revenue is heavily dependent on the financing assumptions, such as debt repayment options, types of bonds used and market conditions at the time of bond issuance.
  - Spreading the tolls to a portion of the existing SR 509 near the Port of Tacoma could reduce traffic diversion and help generate an additional $40 million to $50 million to fund the project. Converting the high occupancy vehicle (HOV) lanes to high occupancy toll (HOT) lanes on I-5 between the King/Pierce County Line and SR 16 would help generate another $75 million to $90 million. However, legislative actions are required to place tolls on these facilities and to use the revenue to help fund the SR 167 extension project.

- Maximize Operational Efficiency of the Corridor
  - Revenue focused tolling is expected to reduce traffic demand by about half compared to a toll free condition, creating the opportunity to downsize or phase construction. Tolling not only makes the corridor operate more efficiently, but also reduces upfront construction cost making the project more feasible.
- Future Economic Considerations
  - Among all the options studied, additional revenue ranging from more than $800 million to nearly $1.6 billion is needed to fund the project depending on how the project construction is phased.
  - Right-of-way needs to be secured prior to bond issuance to minimize risk and financing cost.

Figure 1-1 shows the project cost, expected revenue, and remaining funding gaps for the options studied.

Figure 1-1: Summary of project cost, revenue and funding gap
(In year of expenditure dollars assuming project completion by 2020)




Due to limited resources and time available to conduct this study, WSDOT did not conduct an open house or public workshop. Therefore, we do not have public input on the options studied and findings. WSDOT recommends conducting a comprehensive toll study that includes more refined assumptions for WSTC and legislative consideration. Further, the study should also provide opportunities for public input.

There is a high degree of uncertainty in toll revenue projections, especially for a road that doesn't exist today. Additional variation in the toll funding contribution projections will be a function of the type of debt instruments used, market conditions and interest rates at the time the debt is issued, and policy decisions regarding how the debt is structured.

The assumptions used in this analysis may be somewhat optimistic because repayment of debt was tailored to the assumption that tolls will escalate at 2.5% annually to keep pace with inflation. The estimated toll funding contribution would be somewhat lower if more conservative assumptions regarding toll escalation are adopted.

# 2. SR 167 Extension Project Background

The State Route (SR) 167 extension project has been in development for many years through a cooperative effort between the Washington State Department of Transportation (WSDOT) and our local partners. The initial effort began more than 40 years ago when freeway corridors for Interstate 5, State Route (SR) 167, SR 410, and SR 512 were proposed. By the late 1980s, a four-lane facility from I-405 in Renton to SR 161 in Puyallup was complete. However construction of the SR 167 extension was delayed due to lack of funding.

In 1990, Federal Highway Administration (FHWA) selected the SR 167 extension as a pilot project for a two-tiered EIS. Tiering allowed WSDOT to identify a preferred corridor (Tier I) before moving forward with more detailed analysis of corridor design (Tier II). The Tier I EIS was approved by FHWA in 1999. The Tier II EIS was completed in 2006 and FHWA signed the Record of Decision (ROD) for the Tier II EIS in October 2007.

### Project scope and benefits

The SR 167 extension is comprised of a six-lane divided freeway (including HOV lanes) from SR 161 in Puyallup to I-5 in Tacoma and a four-lane freeway connecting I-5 to SR 509 near the Port of Tacoma.

The SR 167 extension is a critical link missing in the state's highway network. Its completion is expected to:

- Relieve congestion on local roads and other highways by providing new travel options.
- Move freight faster, more safely and more economically. This is especially important in helping the Port of Tacoma remain competitive given the increasingly intense competition from Canada, Mexico and the Panama Canal.
- Improve regional mobility.
- Enhance surface water quality and improve stream habitat feeding into Commencement Bay.

Figure 2-1: Aerial view of the proposed I-5/SR 167 interchange in Fife
(looking from the Lower Puyallup Valley north toward the Port of Tacoma)

## Project funding history

Since 1998, numerous efforts have been made by various entities to fund portions of the project through statewide or regional revenue sources. Through the 2003 Nickel Package and 2005 Transportation Partnership Account (TPA), the state Legislature has allocated $133 million for the corridor design and right-of-way acquisition. Adding local contributions and federal funding, more than $160 million has been invested in the corridor to date. The majority of the funding has been allocated to the purchase of nearly 50% of the right-of-way for the corridor, completion of the EIS and advancement of design to approximately 20%. Approximately $2 billion is still needed to implement the project to its ultimate scope.

Through the formation of a Regional Transportation Investment District (RTID), King, Pierce and Snohomish counties worked together from 2002-2007 to develop a ballot measure intended to fund a package of regionally significant roadway capacity projects. The SR 167 extension was one of the projects included in the RTID ballot measure. The measure was put on the 2007 ballot in combination with a regional transit funding proposal known as Proposition 1. The ballot measure did not pass and the project remains unfunded.

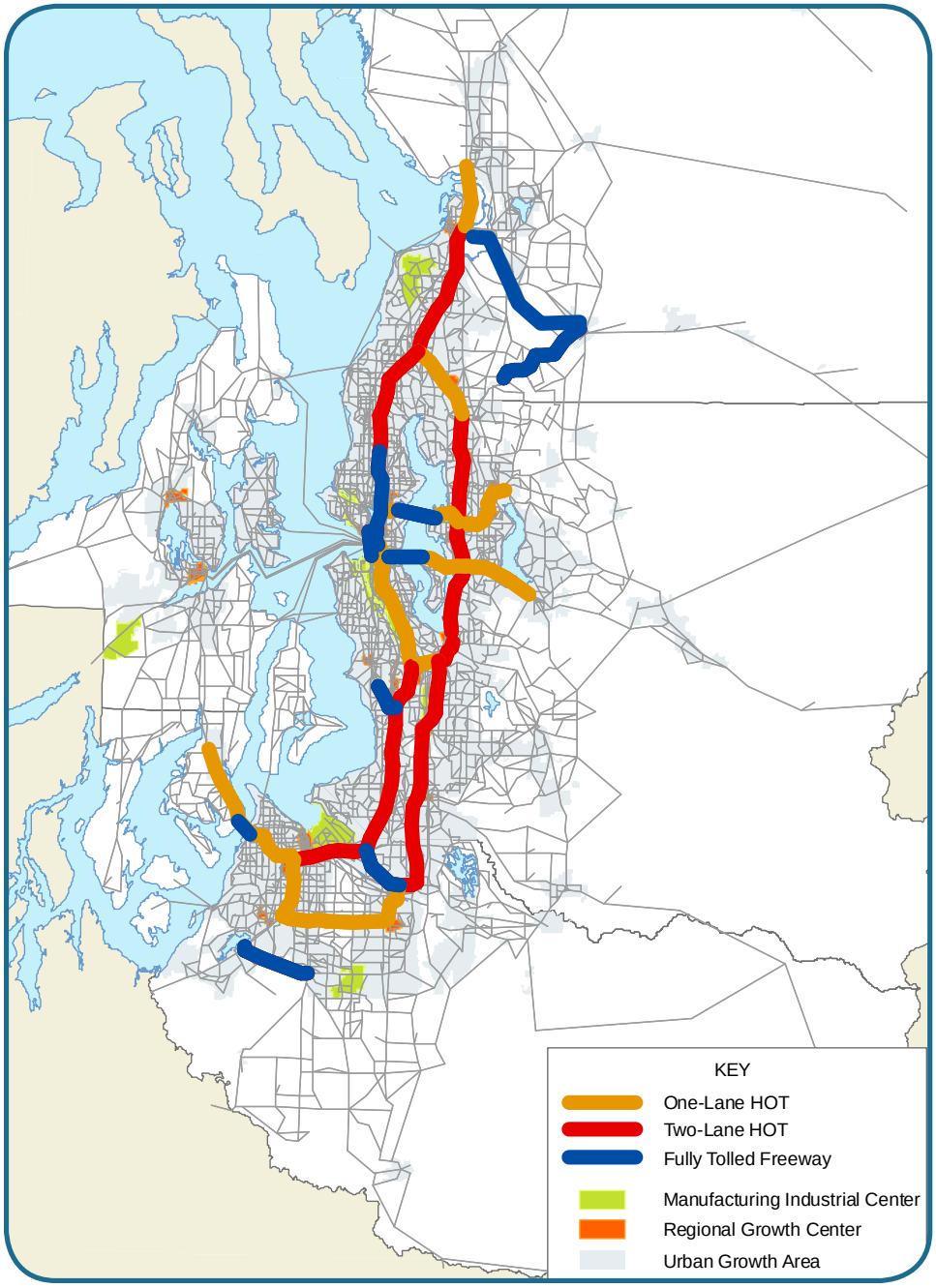
## The regional context

The Puget Sound Regional Council's recently adopted regional Transportation Plan (Transportation 2040) envisions transitioning from existing revenue sources, like gas tax and sales tax, to user fees to fund future transportation improvements. The council's financial strategy starts with developing high occupancy toll (HOT) lanes and moves to tolling individual highway and bridge projects in their entirety as they are implemented. The plan calls for full highway system tolls throughout King, Pierce and Snohomish counties by 2040.

The plan identifies SR 167 extension as a fully tolled facility when constructed. Figure 2-2 illustrates a HOT lane network and selected facility tolling by 2030 as envisioned in the plan.

Based on current economic conditions, it is likely that tolling revenue will be needed for a portion of construction cost required to implement the regional transportation plan and its financial strategies.

Figure 2-2: Tolling envisioned in PSRC's Transportation 2040 plan




Source: Puget Sound Regional Council

# 3. Legislative Proviso and Study Purpose

### Legislative directive

In 2009, the Washington State Legislature directed WSDOT to determine the feasibility of administering tolls within the SR 167 corridor. Specifically, WSDOT was asked to examine the following:

- Potential for variable tolling to generate revenues for needed transportation facilities within the corridor.
- Maximizing the efficient operation of the corridor.
- Economic considerations for future system investments.

The legislative proviso directed WSDOT to periodically update the Washington State Transportation Commission (WSTC) throughout the study and to report the findings to the Joint Transportation Committee (JTC) by Sept. 30, 2010.

### Study purpose

In order to meet the legislative intent, this study was carried out to provide insights into the following:

- Potential revenues and corresponding financial capacity that can be generated from variable tolling to fund the SR 167 extension project.
- How variable tolling may reduce the demand, and consequently the number of new lanes needed within the corridors and affected areas.
- Estimated additional revenues needed to implement the project.

The information generated from this study will be used to inform the state Legislature, the WSTC, and stakeholders for funding decisions to move the project forward.

# 4. Study Approach and Assumptions

Generally, there are two main types of  toll studies – feasibility study and comprehensive study.

- **Feasibility study** is a data driven technical analysis that focuses on traffic and financial modeling, operations and cost estimate with limited or no public and stakeholder involvement. WSDOT conducted a feasibility study for this report.
- **Comprehensive study** is a technical analysis combined with extensive public and stakeholder engagement to address impacts and equity issues, in addition to traffic and revenue modeling.
- Immediately prior to financing, a final study is prepared. It involves updating the traffic and revenue projections conducted in the compressive study for evaluation by credit rating agencies just before the bond issuance. This is commonly referred to as investment-grade study.

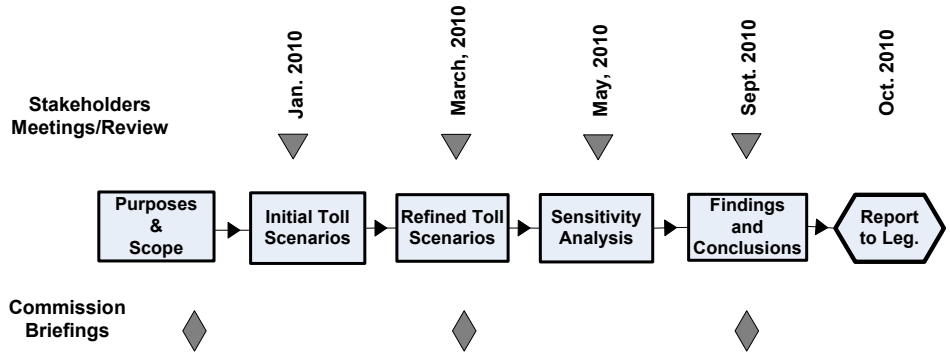
## Study organization

The study was carried out by WSDOT with the assistance of consultants specialized in financial analysis. A stakeholder committee consisting of representatives from regional and local jurisdictions along the corridors was assembled to serve as a sounding board. The stakeholder committee included senior managerial staff from the following jurisdictions and agencies:

- Port of Tacoma
- City of Tacoma
- City of Fife
- City of Edgewood
- City of Puyallup
- City of Milton
- Pierce County
- Puget Sound Regional Council
- Washington State Department of Transportation
- Federal Highway Administration

The stakeholder committee met bimonthly through the course of the study to provide input and review draft results (Figure 4-1). The study draft findings were periodically briefed to the WSTC.

Figure 4-1: stakeholder meetings and commission briefing schedule and topics



## General assumptions

In order to perform the analysis, a number of assumptions were made, including:

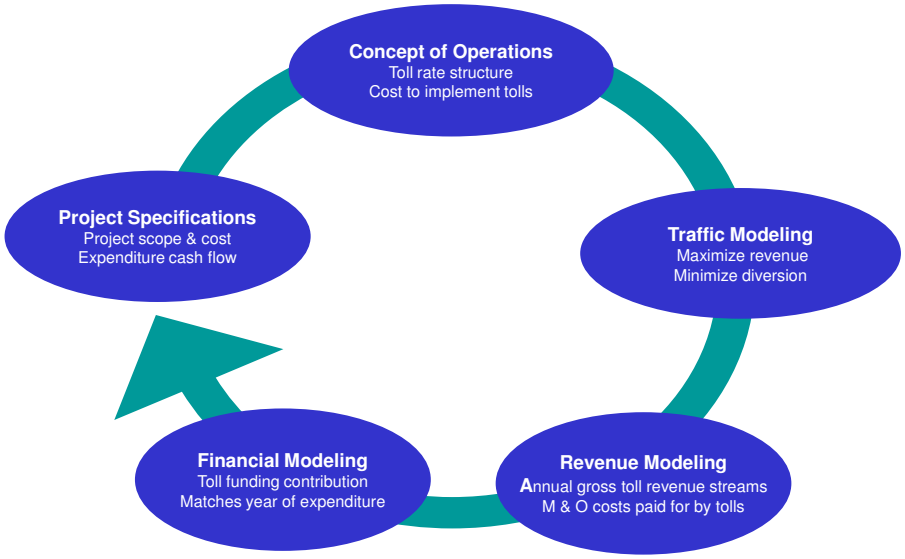
- Corridor construction will start in 2016 and be completed in 2020.
- Toll collection will start in 2020 and continue through 2050.
- All vehicles except transit will pay a toll.
- Tolls vary by time of day based on level of congestion.
- Trucks pay higher tolls based on the number of axles similar to the Tacoma Narrows Bridge.

For detailed assumptions and methodologies, please refer to Chapter 1 of the technical appendix.

## Analysis process

Construction phasing and toll study options were developed through an iterative process. Segmental tolling of the initial option configuration was analyzed first. Several construction phasing options were developed and analyzed based on the initial findings that revenue-focused tolling could reduce traffic by about half compared to a toll free condition. These construction phasing options were tailored to the demand under various tolling concepts. The construction phasing options ranged from one lane in each direction on the extension with minimum improvements on I-5; to two lanes in each direction with all the major connections to I-5. Each analysis cycle involved activities as depicted in the following diagram.

Figure 4-2: Technical analysis process



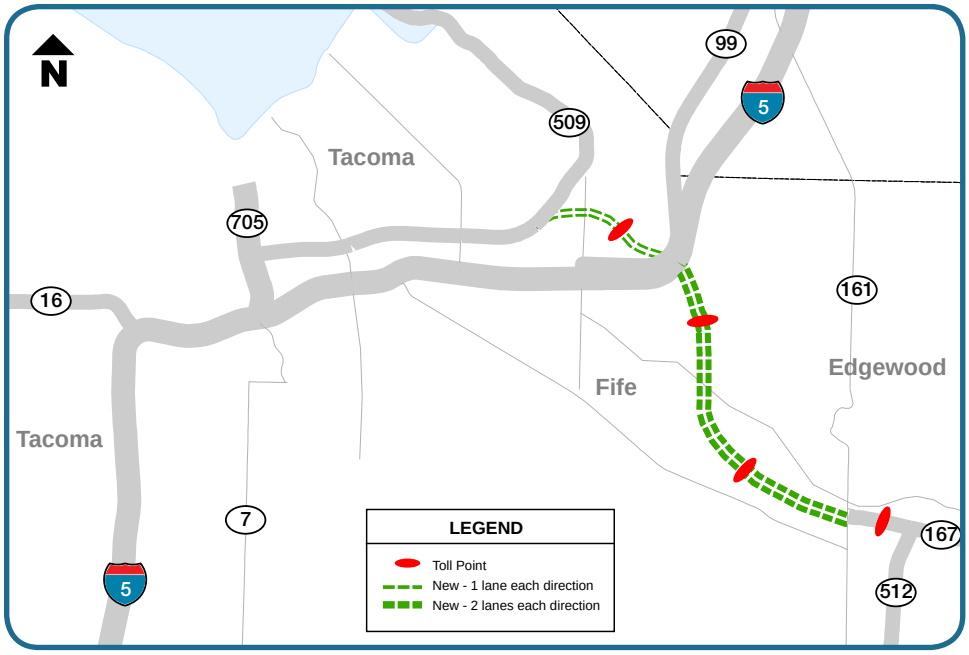
# 5. Initial Toll Option and Analysis Findings

## Initial toll option description

The initial toll option was developed based on the full-build version of the project scope excluding the HOV lanes and using segment tolling as shown in Figure 5-1. The exclusion of HOV lanes from this option was based the experience gained in other studies that tolling is expected to dampen traffic demand significantly, making the HOV lanes unwarranted. HOV lanes are only meaningful and effective when adjacent general purpose lanes are congested.

Toll rates are assumed to be variable based on the time of day. All vehicles except transit are assumed to pay a toll. Trucks pay a higher toll based on the number of axles.

Figure 5-1: Initial toll option




## Initial toll option analysis

The initial toll option analysis went through cost estimation, traffic and revenue modeling, and financial analysis.

### Cost estimation

The cost estimate was developed based on the 2008 Cost Estimate Validation Process (CVEP) estimate. CEVP is an intense workshop where transportation projects are examined by a team of top engineers and risk managers from local and national private firms and public agencies. The CEVP workshop team uses systematic project review and risk assessment methods to identify and describe cost and schedule risks and evaluate the quality of the information at hand. Importantly, the process examines, from the very beginning, how risks can be lowered and cost vulnerabilities can be managed or reduced.

The 2008 CEVP resulted in a cost estimate of slightly over $2 billion in year-of-expenditure dollars. It assumed that funding would be available beginning in July 2009 from the RTID funding package.

This study updated the 2008 CEVP cost estimate to reflect:

- Exclusion of HOV lanes and their direct access connection with I-5.
- New schedule assumption that right-of-way will be secured by 2015. Construction would begin in 2016 and be completed by 2020.
- Most recent real bid information.

This revision resulted in total base cost of $1.64 billion including right-of-way cost of $174 million, preliminary engineering cost of $109 million, and construction cost of $1.34 billion. Inflated to the year-of-expenditure dollars, the total cost of the initial option is $1.88 billion in year-of-expenditure dollars. Cost estimation details are documented in Chapter 2 of the Technical Appendix.

The roadway operation and maintenance (O&M) cost estimate is based on past O&M expenditures on similar roadways in the project vicinity with the following assumptions:

- O&M cost of pavement ranges from $7,400/lane-mile/year to $10,000/lane-mile/year depending on type of roadway and traffic volume.
- O&M cost of bridges is based on $35,700/lane-mile/year.
- No pavement rehabilitation is needed along I-5 for the following 30 years because the concrete pavement is expected to last beyond the 30 year financial analysis period; however, the cost of asphalt pavement rehabilitation ($275,000/lane-mile every 14 years) is considered along SR 167.

The estimated annual O&M cost of the initial option is $240,000 per year.

The toll capital equipment and construction cost were estimated based on estimates completed for other planning-level efforts in projects such as the reconstructed SR 520 corridor, I-405 corridor, SR 99 viaduct replacement, and SR 167 HOT lanes.

The total project cost, including preliminary engineering (PE), right-of-way (ROW) acquisition, construction (CN), roadway O&M and initial toll equipment capital and installation cost are shown in the Table 5-1 below.

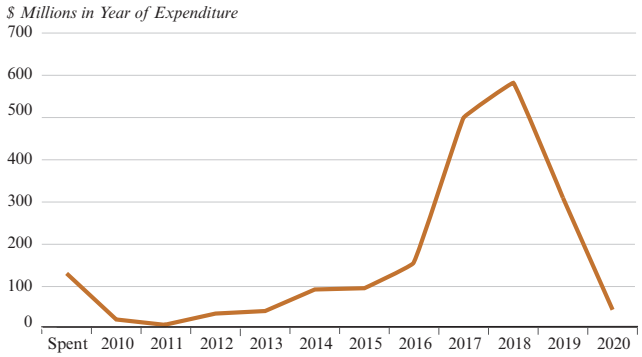
Table 5-1: Initial toll option cost estimate (in $ millions)

| Cost Items | Estimated Cost |
|---|---|
| ROW, PE and CN | $ 1,867 |
| Annual Roadway O&M Cost | $ 0.2 |
| Repaving cost every 14 years | $ 5.5 |
| Toll capital cost | $ 13.0 |

Initial capital costs are in year of expenditure dollars.
Recurring costs are in 2010 dollars.

Figure 5-2 shows the cash flow assumptions. It reflects the assumption that project construction starts in 2016 and is completed by 2020.

Figure 5-2: Initial toll option expenditure cash flow assumption




## Traffic modeling

To explore the potential for revenue generation, a series of toll rates ranging from $0.50 to $7.00 at $0.50 increments were tested using the Puget Sound Regional Council's travel demand forecast model. It was found that toll rates shown in Table 5-2 are close to yielding the highest revenue:

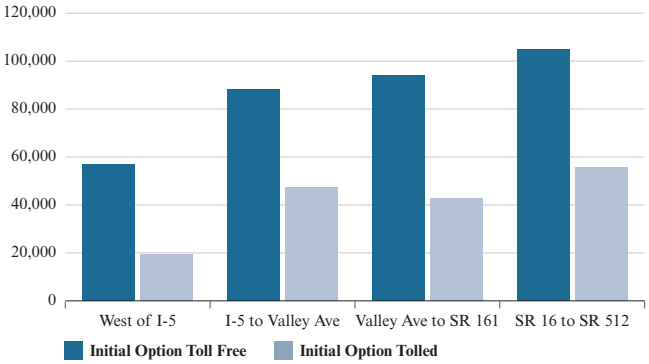
Table 5-2: Initial option revenue focused toll rates (in 2008 dollars)

| Time periods | East of I-5 | West of I-5 |
|---|---|---|
| AM Peak | $2.00 - $3.00 | $0.75 - $1.50 |
| Midday | $ 2.00 | $0.75 |
| PM Peak | $2.50 - $5.00 | $0.75 - $1.50 |
| Evening | $2.00 - $3.00 | $0.50 - $1.25 |
| Night | $1.00 | $0.50 |

Note: where toll rate is expressed in a range, the high end is for the peak direction, the low end is for the off-peak direction.

The regional travel demand forecast model indicated that tolling could decrease traffic demand by half compared with a toll free condition (see Figure 5-3). This creates an opportunity to phase construction of the project, thereby reducing the initial construction cost and improving the ratio of toll funding contribution.

Figure 5-3: 2030 Average daily traffic forecast: toll free versus tolled



### Initial option financial analysis

The analysis assumptions were built on and consistent with other toll studies completed recently including the SR 520 bridge replacement, I-405 express toll lanes, and Alaskan Way Viaduct replacement. The financial analysis include three steps: gross revenue forecast, net revenue forecast, and bonding capacity analysis.

The regional travel demand forecast model was used to estimate gross revenues for each of the study options. The model is designed to approximate traffic congestion and people's willingness to:

- Pay a toll to avoid congestion.
- Choose to travel during a less congested times and pay a lower toll.
- Choose other travel options (i.e., transit).
- Choose a different route to avoid the toll altogether.

The gross revenues were estimated for 2020, 2030 and 2040 from which an annual gross revenue stream was extrapolated for a 30-year financing period. Some of the key assumptions include:

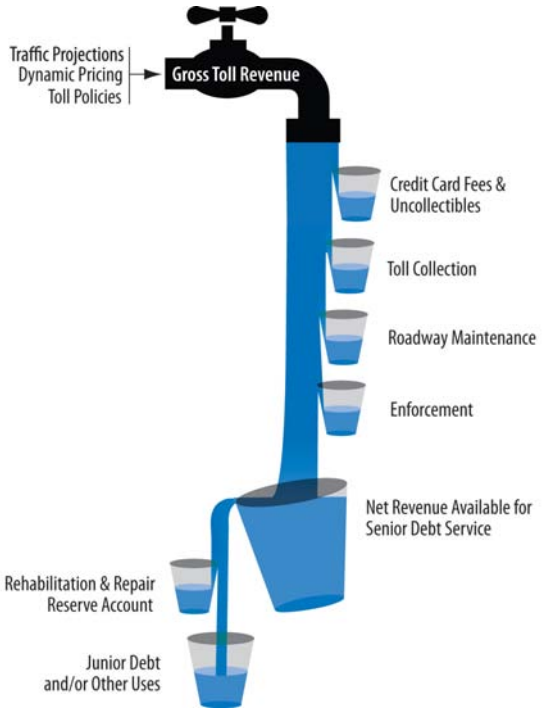
- Toll all users except transit riders
- Toll rates are variable by time of day and tolls are applied 24 hours per day.
- All-electronic tolling: users will either pay via transponders or through mailed invoicing (pay-by-mail transactions).
- Pay-by-mail transactions are subject to a surcharge to cover the additional processing costs. For the purposes of this analysis, surcharge revenue is assumed to equal pay-by-plate processing costs, making this surcharge revenue neutral.
- Adjusted gross revenue includes revenues from tolls and pay-by-plate surcharge as well as the deduction for credit card fees and uncollectible toll revenues.

Net revenue, or cash flow available for debt service, is estimated by deducting O&M costs from gross revenues. These costs include everything needed to maintain and operate the toll system and the facility over the life of the facility. These costs were estimated using several sources, including existing WSDOT roadway maintenance costs, and experience gained from the existing SR 167 HOT Lanes Pilot Project. Detailed information on operating and maintenance assumptions and associated costs are included in the Technical Appendix.

Financing capacity analysis is performed based on a set of assumptions. The assumptions were drawn upon those that have been used in planning work for other WSDOT projects. The other assumptions include:

- Toll rates would increase 2.5% per year
- Maximum bond maturity of 30 years.
- Bonds were assumed to tailor debt service repayment to a growing revenue stream.
- 1.50x debt service coverage.
- Average interest rate of 7.0% and 7.75%
- Annual bond issuances are assumed through the construction period.

Figure 5.4: Financial analysis process




The financial analysis (as shown in Table 5-3) indicated that the potential financial capacity of this option is expected to be between $275 million and $370 million, about 20% of the total project cost, leaving a funding gap of $1.5 billion to $1.6 billion.

Table 5-3: Initial toll option financial analysis results (in $ millions)

| Funding Needs (YOE) $s | | | Toll Funding Contribution | | Total Remaining Funding Gap |
|---|---|---|---|---|---|
| Total | Upfront | Const. | Net Toll Funding Range | % of Const. | |
| $1,880 | $280 | $1,600 | $275 - $370 | 17% - 23% | $1,510 - $1,605 |

Note: all values are in year-of-expenditure (YOE) dollars.

# 6. Additional Construction Phasing/Toll Options Analysis and Findings

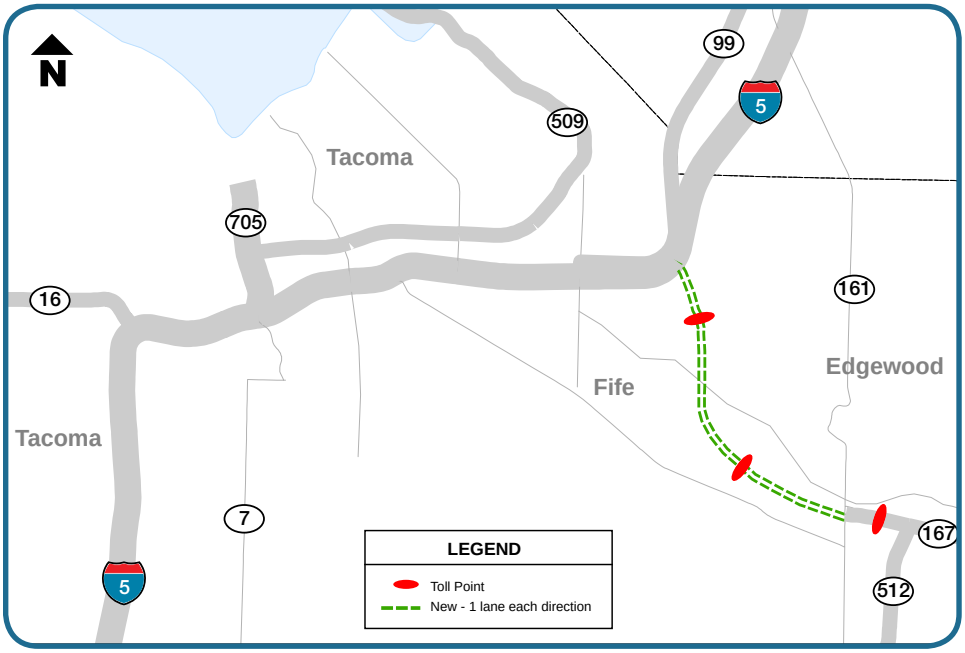
Two construction phasing options and additional toll concepts were developed and analyzed, based on findings from analyzing the initial toll option that revenue focused tolling could dampen traffic demand by about half. Construction phasing options ranged from constructing one lane in each direction for the entire extension; to constructing one lane in each direction for part of the extension. Tolling concepts ranged from tolling the extension only, to tolling a portion of the existing SR 509 corridor and converting the HOV lanes on I-5 to HOT lanes. The detailed construction phasing options and their associated toll concepts are described below.

## Additional construction phasing/toll description

### Option 1

Option 1 assumed building only the southern half of the roadway embankment to provide one lane in each direction between SR 161 and I-5 with partial interchanges at SR 161, Valley Avenue and I-5 while deferring the extension west of I-5 and other improvements to future phases. This option would have segment tolling with three tolling points as shown below.

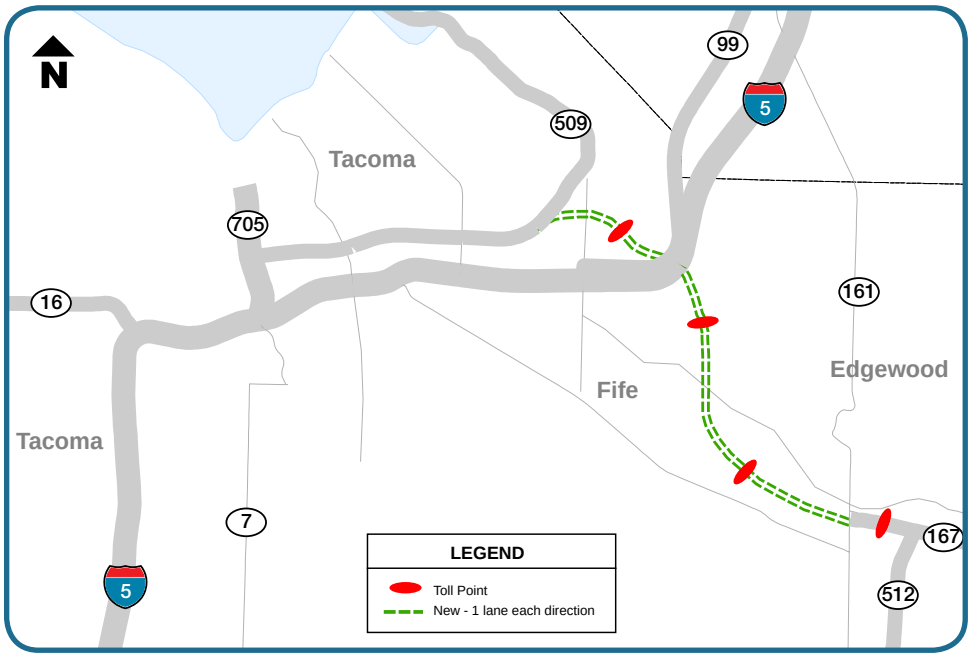
Figure 6-1: Option 1 and toll concept



## Option 2

This construction phasing option assumed building one lane in each direction for the entire corridor from SR 509 to SR 161 with partial interchanges at SR 509, 54th Avenue E., I-5, Valley Avenue and SR 161. This option also assumed segment tolling as shown in Figure 6-2 below.

Figure 6-2: Option 2 and toll concept




## Options 2a, 2b and 2c

Options 2a, 2b and 2c would have the same geometric configuration as option 2, plus additional tolling on SR 509 and/or I-5 as shown in Figures 6-3, 6-4 and 6-5. Option 2a spreads the same amount of tolls placed on the extension west of I-5 in option 2 to a portion of the existing SR 509 between Portland Avenue and just east of Alexander Avenue. This option is designed to reduce traffic diversion from the west segment of the new extension. Option 2b assumed converting the I-5 HOV lanes from SR 16 to the Pierce/King County line into HOT lanes. Option 2c combined Option 2a and 2b to include tolling the existing SR 509 and I-5 HOT lanes.

Figure 6-3: Option 2a toll concept

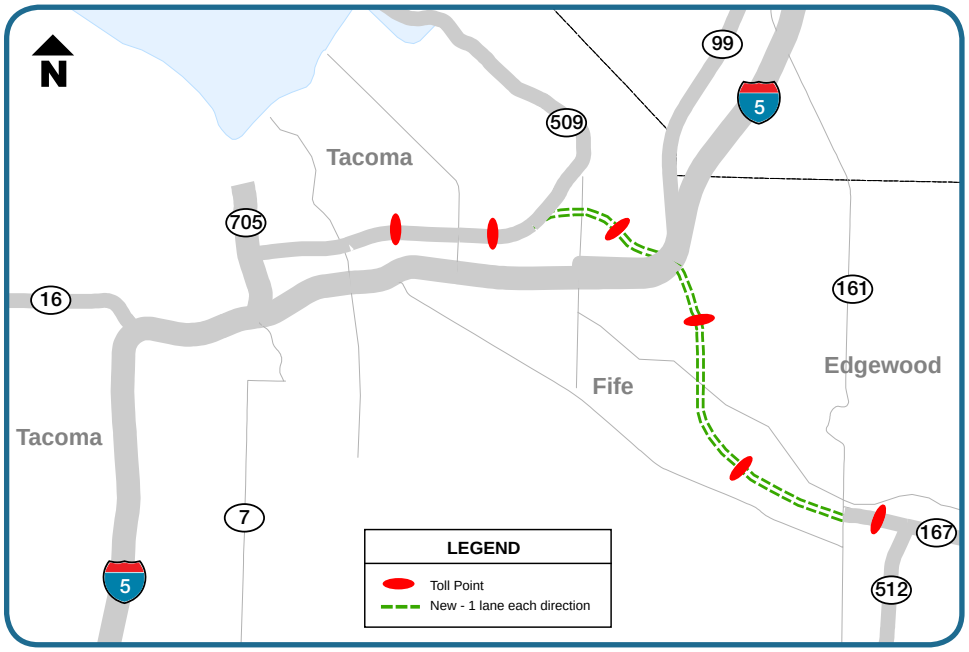


Figure 6-4: Option 2b toll concept

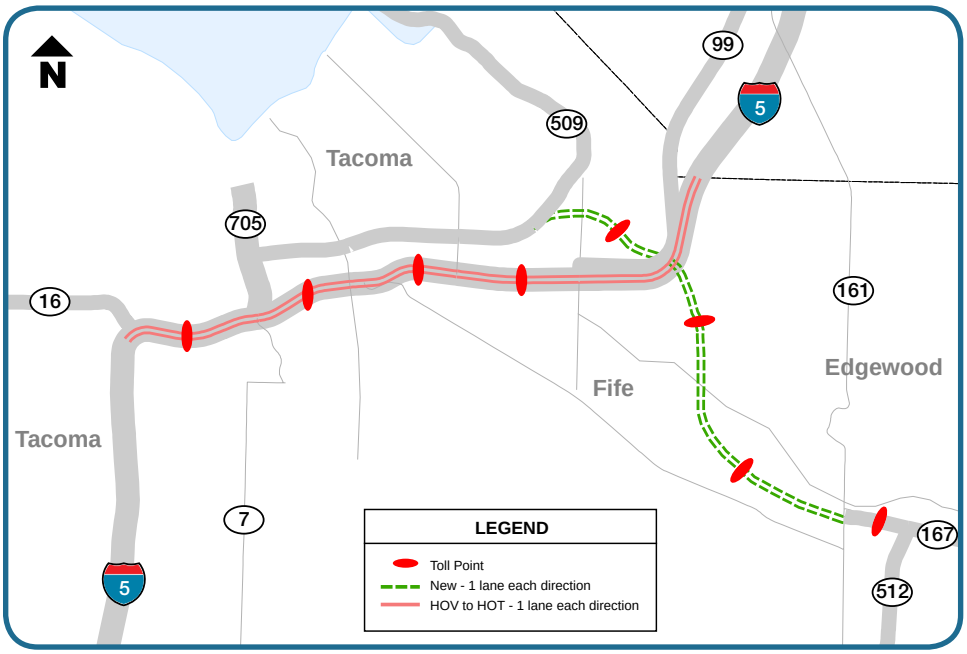
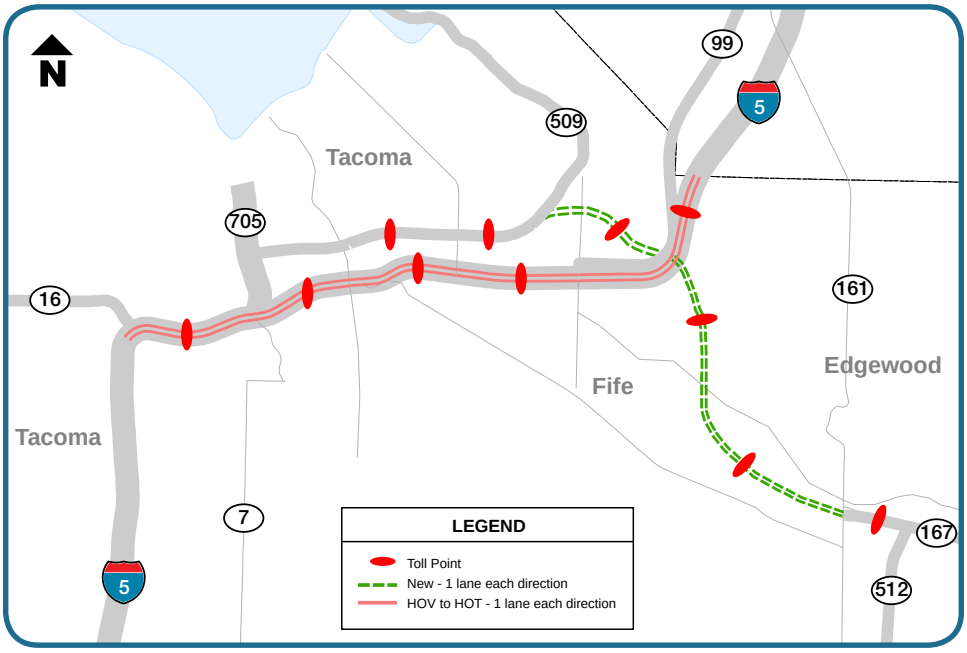



Figure 6-5: Option 2c toll concept



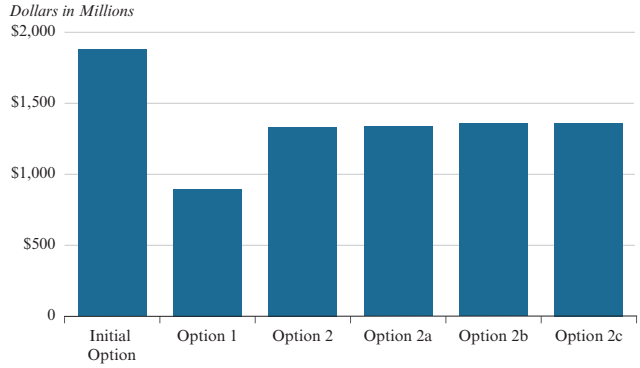
## Additional construction phasing/toll analysis

The additional toll options went through cost estimation, traffic and revenue modeling, and financial analysis, consistent with the initial toll option analysis process.

### Cost estimate

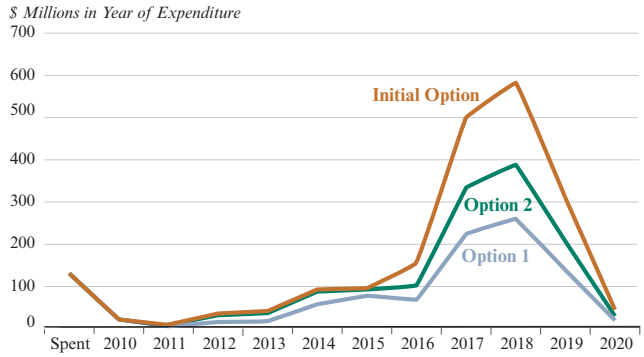
The cost estimates for right-of-way, preliminary engineering, construction, annual operations and maintenance, periodical pavement rehabilitation, and toll equipment and installation are summarized in the table below (information for the current design is also included for comparison).

Figure 6-6: Cost estimates for all the options in year of expenditure dollars (in $ millions)




Using consistent assumptions from the initial toll option, all construction phasing options were assumed to start construction in 2016 and be completed in 2020. The expenditure cash flows are shown in Figure 6-7 below.

Figure 6-7: Expenditure cash flow assumptions



## Traffic modeling

To explore the potential for revenue generation, a series of toll-rate sensitivity tests were conducted for each of the toll options using the regional travel demand forecasting model. The table below summarizes toll rates that are found to yield the highest gross revenues as predicted by the regional model. Column two shows the total toll rate for all of the segments east of I-5. The lower number is for the toll rate in the off-peak direction, the higher number is for the peak direction. Column three shows option 2 toll rates on the western section of the SR 509 extension between I-5 and SR 509. Column four shows options 2a and 2c combined toll rates on the western section of the SR 509 extension and on the existing SR 509. I-5 HOT lane toll rates under options 2b and 2c are mileage based and are shown in the last column.

Table 6-1: Revenue focused toll rates (in 2008 dollars)

| Time Periods | Extension East of I-5 All options | Extension/SR 509 West of I-5 | | I-5 HOT lanes Options 2b & 2c |
|---|---|---|---|---|
| | | Extension Only Option 2 | Ext. & SR 509 Option 2a & 2c | |
| AM Peak | $2.00 - $3.00 | $.75 - $1.50 | $1.00 - $2.00 | $0.20/mile |
| Midday | $2.00 | $0.75 | $1.00 | $0.10/mile |
| PM Peak | $2.50 - $5.00 | $0.75 - $1.50 | $1.00 - $2.00 | $0.30/mile |
| Evening | $2.00 - $3.00 | $0.50 - $1.25 | $1.00 - $1.25 | $0.00 |
| Night | $1.00 | $0.50 | $0.75 | $0.00 |

Note: Toll rates are in 2008 dollars. The high and low range of the toll rates are for peak and off peak directions respectively.

Traffic analysis indicated that revenue-focused tolling could reduce traffic demand by about half compared to the toll free condition (see Figure 6-8). This creates the opportunity to phase the project, reducing the initial construction cost and improving the ratio of toll funding contribution. The two charts below (figures 6-8 and 6-9) show 2030 daily traffic forecasts for the options studied at referenced locations. Because traffic volumes are sensitive to toll rates, different toll rates will result in different forecasts.

Figure 6-8: 2030 daily traffic forecast for all options: east section between I-5 and Valley Avenue

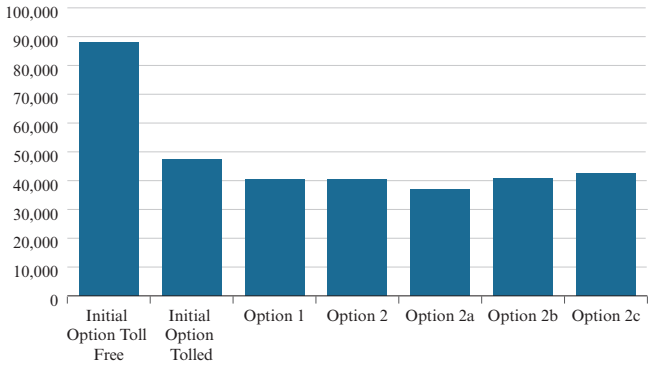
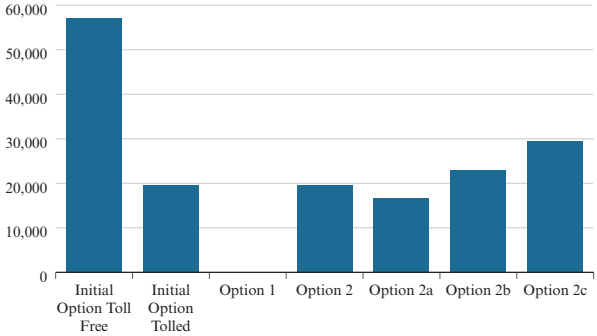


Figure 6-9: 2030 daily traffic forecast for all options: west section between SR 509 and I-5




Note: Option 1 does not include a West Section between SR 509 and I-5.

## Financial Analysis

The Puget Sound regional travel demand forecast model was used to estimate gross revenues for each study option. Gross revenues were estimated for 2020, 2030 and 2040 and an annual gross revenue stream was extrapolated for a 30-year financing period. Net revenue, or cash flow available for debt service, is estimated by deducting O&M costs from gross revenues. These costs include everything needed to maintain and operate the toll system and the facility over the life of the facility.

Bonding capacity analysis was then performed based on the same set of assumptions used in analyzing the initial toll option. The assumptions were drawn upon those that have been used in planning work for other WSDOT projects.

The chart and the table below summarizes the cost, financial analysis results and projected remaining funding gaps for all the options using the assumptions listed above.

Figure 6-10: Summary of project cost, revenue and funding gap
(In year of expenditure dollars assuming project completion by 2020)

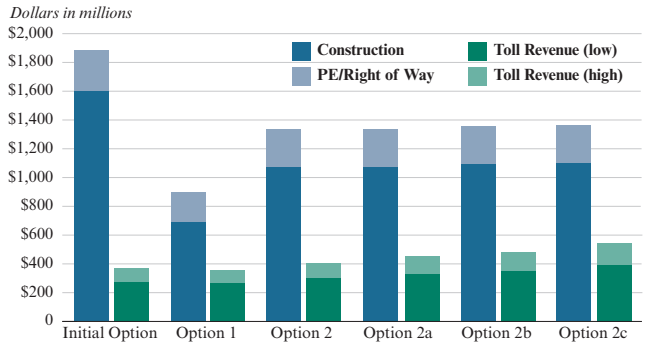


Table 6-2: Financial analysis results (in $ millions)

| Options | Funding Needs (YOE $s) | | | Toll Funding Contribution | | Total Remaining Funding Gap |
|---|---|---|---|---|---|---|
| | Total | Upfront PE/ROW | Const. | Net Toll Funding Range | % of Const. Cost | |
| Initial Option | $1,880 | $280 | $1,600 | $275 - $370 | 17% - 23% | $1,510 - $1,605 |
| Option 1 | $897 | $204 | $693 | $265 - $360 | 38% - 52% | $537 - $632 |
| Option 2 | $1,332 | $261 | $1,071 | $295 - $405 | 28% - 38% | $927 - $1,037 |
| Option 2a | $1,336 | $261 | $1,075 | $325 - $455 | 30% - 42% | $881 - $1,011 |
| Option 2b | $1,358 | $261 | $1,097 | $350 - $480 | 32% - 44% | $878 - $1,008 |
| Option 2c | $1,362 | $261 | $1,101 | $390 - $545 | 35% - 49% | $817 - $972 |

In the table above, all the values are in year-of-expenditure (YOE) dollars. In the funding needs column, the right-of-way (ROW) cost is the additional amount required to secure all ROW needed to implement the ultimate scope of the project, excluding the amount already spent and available to spend. The difference in upfront project engineering (PE) and ROW cost for various options reflect the different amount of design work required. To minimize toll financing cost, ROW is assumed to be funded and secured from other revenue sources before bond issuance.

In the toll funding contribution column, the projected net toll funding is expressed in a range. The high range is tied to the number of transactions as projected by the regional travel demand model. The lower range is calculated by taking a 20% reduction from the gross revenue to convey uncertainty in the traffic forecast.

As projected by the regional travel demand model based on the assumptions described earlier, the net toll revenue is expected to be somewhere between $275 million for the initial toll option and $500 million for option 2c. This accounts for revenues from tolling the extension, a portion of the existing SR 509 (about $50 million) as well as HOT lanes on I-5 from SR 16 to the King/Pierce county line (about $70 million).

The percentage of construction cost column shows the projected net toll funding contribution as a percentage of construction cost excluding ROW. The analysis results indicate that tolling could generate revenue to fund 20% (initial toll option) to about 50% (options 2 and 2c) of construction costs depending on how the project is phased. Tolling a portion of the existing SR 509 and converting I-5 HOV lanes to HOT lanes would allow the expansion of the project scope and still maintain a similar percentage of toll contribution toward construction cost (option 2c). However, tolling any portion of the existing SR 509, and implementing HOT lanes on I-5, and using these revenues to fund the SR 167 extension construction will require legislative approval.

The last column of the table summarizes the remaining funding gap for each of the options studied. The initial toll option has the largest funding gap, estimated at about $1.6 billion. Option 1 is expected to have the smallest funding gap of about $600 million. Option 2 is estimate to have a funding gap of approximately $1 billion. Tolling a portion of the existing SR 509 and converting I-5 HOV lanes to HOT lanes could generate additional revenue. However, relative to the $1 billion funding gap, the amount of revenue generated from these additional tolls is expected to be nominal.

There is a high degree of uncertainty in toll revenue projections, especially for a road that doesn't exist today. Additional variation in the toll funding contribution projections will be a function of the type of debt instruments used, the market conditions and interest rates at the time the debt is issued, and policy decisions regarding how the debt is structured.

The assumptions used in this analysis may be somewhat optimistic because repayment of debt was tailored to the assumption that tolls will escalate at 2.5% annually to keep pace with inflation. The toll funding contribution would be somewhat lower if more conservative assumptions regarding toll escalation are adopted.

# 7. Findings and Next Steps

The analysis was conducted in close coordination with stakeholders from affected jurisdictions including the Port of Tacoma, Pierce County, the cities of Tacoma, Fife, Edgewood, Puyallup, and Milton; the Puget Sound Regional Council, and the Federal Highway Administration. In terms of project scope, the study analyzed three construction options ranging from the full build – excluding HOV lanes, to constructing one segment of the SR 167 extension connecting with I-5. The study looked at several tolling concepts including tolling just the SR 167 extension, as well as tolling the SR 167 extension in conjunction with tolling a portion of the existing SR 167 near the Port of Tacoma. The study also looked at converting the I-5 HOV lanes currently under construction and operating them as HOT lanes. The study found that:

- Expected Toll Revenue
  - Tolling is expected to generate a significant amount of revenue to fund the project construction, ranging from about 17% for the initial toll option to about 50% of option 1 – constructing one lane in each direction from I-5 to SR 161.
  - The bonding capacity of the toll revenue is heavily dependent on financing assumptions, such as debt repayment options, the types of bonds used and market conditions at the time of bond issuance.
  - Spreading tolls to a portion of the existing SR 509 near the Port of Tacoma could reduce traffic diversion and help generate an additional $40 million to $50 million to fund the project. Converting the HOV lanes to high occupancy toll HOT lanes on I-5 between the King/Pierce County line and SR 16 would help generate another $75 million to $90 million. However, legislative actions are required to place tolls on these facilities and use the revenue to help fund the SR 167 extension project.
- Maximize Operational Efficiency of the Corridor
  - Tolling aimed at generating revenue is expected to reduce traffic demand by about half compared to a toll free condition, creating the opportunity to downsize or phase construction. Tolling not only makes the corridor operate more efficiently, but also reduces upfront construction cost making the project more feasible.
- Future Economic Considerations
  - Among all the options studied, additional revenue ranging from more than $800 million to nearly $1.6 billion is needed to fund the project depending on how the project construction is phased.
  - Right-of-way needs to be secured prior to bond issuance to minimize risk and financing cost.

The next steps include making collaborative decisions regarding the following:

- How to scale and phase project construction.
- When to build the project.
- How to finance the project.
- How to collect tolls, and what toll rate to set.
- In addition to working with local jurisdictions, the regional transportation planning organization, FHWA, WSODT, and other stakeholders, the decision making process must also offer opportunities for public review and comments.

# 8. Stakeholders Input

July 12, 2010

Secretary Paula Hammond
Washington State Department of Transportation
PO Box 47316
Olympia, WA 98504

Dear Secretary Hammond:

We are writing to you as co-chairs of the Regional Access Mobility Partnership (RAMP), a regional coalition including business, labor, public and private organizations and citizens dedicated to improved mobility in the South Sound and Washington State.

We would like to take this opportunity to comment on the Washington State Department of Transportation's (WSDOT) study examining the feasibility of tolls as a partial funding solution for completing SR-167. We have greatly appreciated the opportunity to interact with the study team as they have worked on the project. As you know, the Legislature's budget proviso requiring the study did not anticipate a formal public comment process. As such, we have taken the liberty to provide some thoughts to you as the Department reviews results of the study and considers next steps in the effort to complete SR-167.

First, we would like to applaud WSDOT for its work on the study. The citizens of Pierce County have been waiting for decades for this important highway connection to be completed. While we realize tolling likely will provide only a portion of the dollars needed for construction, we are pleased that the Department and the State are beginning the conversation about funding the remaining piece of this highway.

Second, we remain committed to the goal of completing SR-167. Completion would entail, at a minimum, some sort of a connection all the way from SR-509 to SR-161.

Finally, as the State considers the mix of tolls and direct state spending for the highway, we would ask that it consider precedents on other corridors. As you know, Pierce County users pay a substantial portion of the bonds for the Tacoma Narrows Bridge. In contrast, it appears that users are anticipated to pay between 24% and 31% of the costs of the SR-

520 bridge replacement through tolls (depending on revised cost estimates of the new west-side design option). It is also our understanding that initial studies by WSDOT anticipates that users will likely only contribute 13% to the replacement of the SR-99 Viaduct in Seattle. With this in mind, we would ask that should tolls be used to help pay for completion of SR-167, the State consider a toll participation level of between 13% and 30% of the cost of construction.

As noted above, RAMP deeply appreciates the work by both the Department and the tolling feasibility study team. We hope that you find our comments to be helpful as WSDOT considers next steps in advancing the SR-167 project. We all share the Department's commitment to developing an effective, efficient transportation system. We look forward to partnering with you to ensure that the uncompleted portion of SR-167 from SR-161 to SR-509 is funded and constructed.

Sincerely,

Pat McCarthy
Executive
Pierce County
RAMP Co-Chair

David Graybill
President and CEO
Tacoma-Pierce Co. Chamber of Commerce
RAMP Co-Chair

John Wolfe
CEO
Port of Tacoma
RAMP Co-Chair

Cc: Pierce County legislative delegation
Kevin Dayton, WSDOT Olympic Region Administrator
Craig Stone, WSDOT Toll Director