



## PROJECT DATA

**Type of Project:** Infrastructure Improvement (Interstate Highway Interchange Replacement)

**Location of Project:** The 116th Street NE Interchange (116th Interchange) accesses Interstate 5 (I-5) and is located in Tulalip, Washington. The 116th Interchange directly serves the City of Marysville, Snohomish County, and the Tulalip Indian Reservation, and supports the greater Puget Sound Region. The area is part of Washington's 2nd Congressional District.

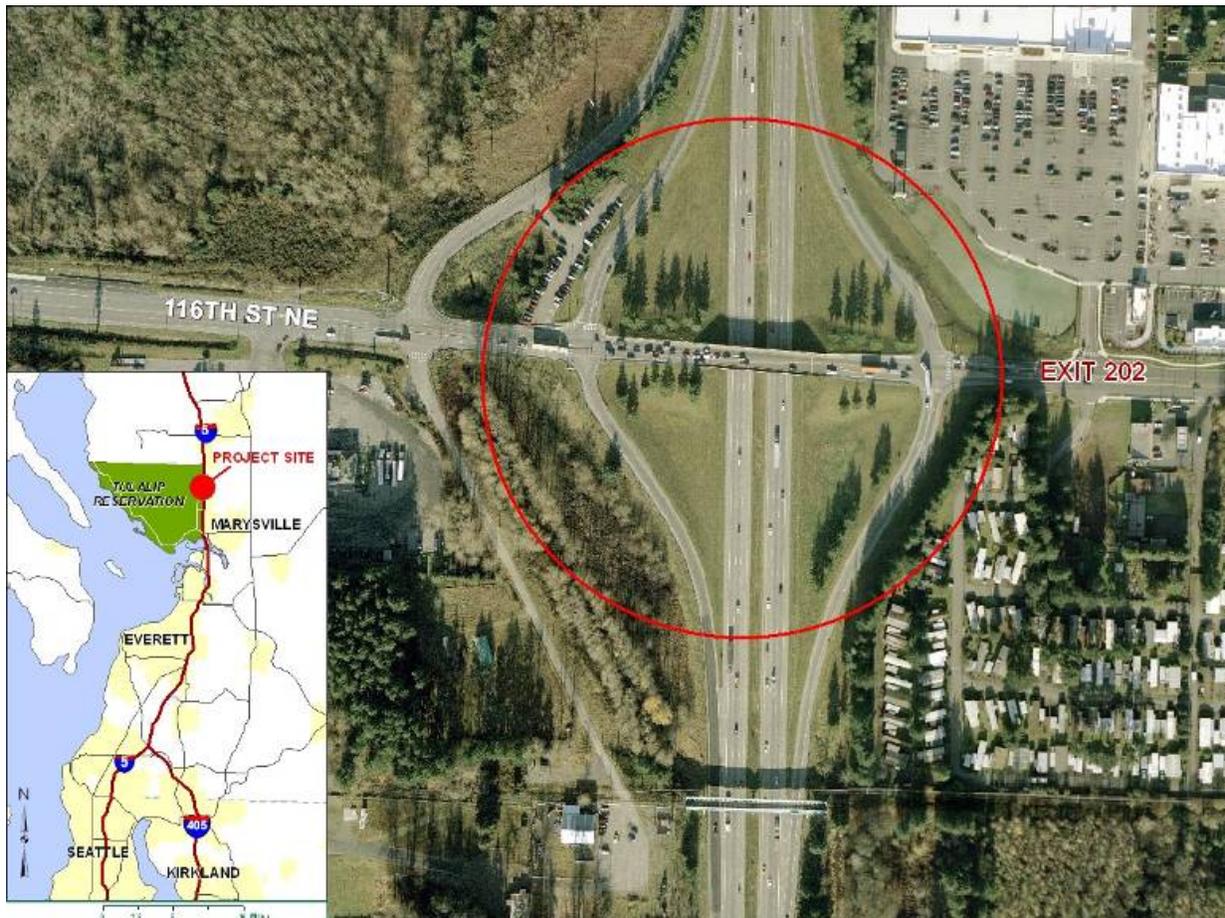
**Urban or Rural Area:** This is a developing urban area.

**Grant Funds Requested:** \$43.1 million

**Applicant:** Tulalip Tribes

**Project Website:** <http://projects.tulaliptribes-nsn.gov/116th-interchange/index.aspx>

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## PROJECT DESCRIPTION

The Tulalip Tribes are stepping forward on behalf of the City of Marysville, Snohomish County, and the Tulalip Indian Reservation and submitting this \$43.1 million TIGER grant application to complete the final phase of the 116th Interchange project by replacing the existing diamond interchange with a “Single-Point Urban Interchange.” The aging “diamond” interchange serving these communities at the crossing of I-5 and 116th Street NE was constructed in 1971. Nearly 40 years ago, these Puget Sound Washington communities were lightly populated and the surrounding region was decidedly rural in character. Today, the region is an emerging urban area, with major destinations such as the commercial centers at the Tulalip’s Quil Ceda Village and the Gateway Shopping Center. Many new residential neighborhoods have sprung up, and house, for instance, workers for the largest aircraft manufacturing facility in the world (Boeing Everett plant) and the Everett Naval Station. As a result the 116th Interchange is simply dysfunctional. Elements of the current problems with the 116th Interchange include:

*The final phase of the 116th Interchange can move forward immediately with the infusion of \$43.1 million in funding. Local, regional and state transportation plans include the 116th Interchange, alternatives have been analyzed, environmental (NEPA) review conducted, public involvement processes completed, and engineering design is underway.*

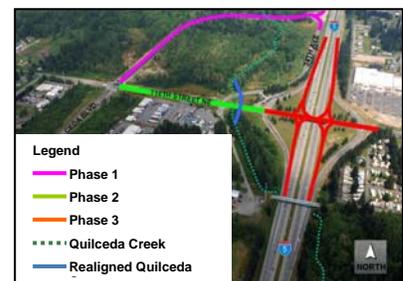
- Traffic volumes and interchange configurations cause back-ups onto I-5 travel lanes.
- Unnecessary congestion increases idling and greenhouse gas emissions.
- Economic development opportunities are stifled by access problems off I-5.
- Standards for interchange construction are no longer met.
- More efficient and effective interchange designs are available.
- Interchange structures impede fish passage and shed polluted stormwater into adjacent stream areas.
- Pedestrian and bicycle users must contend with a narrow unsafe option for crossing I-5.

Magnifying these local needs and concerns associated with the 116th Interchange, I-5 is the only north-south Interstate on the West Coast, and the major north-south international trade corridor connecting Washington with Canada, Oregon, California and Mexico. The portion of I-5 passing through the City of Marysville, Snohomish County, and the Tulalip Indian Reservation is a crucial freight link between the major ports of Seattle and Tacoma, and the Canadian market. Approximately 76 miles south of the U.S.-Canada border, and 36 miles north of downtown Seattle, the 116th Interchange provides access to significant traveler and employment centers, and invites Canadian dollars into the regional and local economy. Problems with the existing 116th Interchange thus harm the larger Puget Sound region as well as local communities and businesses.

The level of commitment of the Tulalip Tribes and other local jurisdictions to the 116th Interchange project is amply evidenced by the \$17.6 million worth of design and construction, out of a total project cost of \$62.6 million that has already been completed or is underway. Some of these early phases actually exceed conventional regulatory or design requirements, such as with already completed culvert replacements and now underway stream restoration. The Tulalip Tribes also have an additional \$1.9 million in hand to contribute to the 116th Interchange project.

Specific 116th Interchange project activities completed through September 2009, as shown in the photo at below, include:

- Quil Ceda Boulevard was extended to provide better north-south arterial circulation on the West side (2007).
- Realignment of an arterial located west of the interchange, 34th Avenue NE, to connect with Quil Ceda Boulevard. Access management was implemented and a signal was removed to reduce congestion (2007).
- Widening of 116th Street NE, including replacement of a narrow, failing culvert with a larger 18-foot diameter “fish-passage friendly” culvert (2007-08).
- Replacement of a culvert under 34th Avenue NE with a larger 18-foot fish passage culvert (2009).
- Restoration of Quil Ceda Creek to its original meander to provide stream habitat more suitable for salmon and other aquatic species. Other off-site mitigation and habitat restoration is underway (2009).



*116th Intersection Project Phases.*

With ARRA funding, the 116th Interchange project will build on the above-described earlier and current investments to:

- Replace the existing non standard three-lane bridge over I-5 with a full standard eight-lane bridge that includes bike lanes and sidewalks.
- Realign the interchange layout from a diamond with two signals into a one-signal single point urban interchange single point urban interchange (SPUI) layout.
- Provide additional westbound and eastbound through-lanes and left turn storage.
- Widen and realign off-ramps to include additional left- and right-turning lanes to provide adequate storage lengths for traffic queues to remove existing back ups onto the I-5 mainline.
- Provide ramp metering and a high occupancy vehicle (HOV) bypass lane on the southbound on-ramp to encourage use of carpooling and public transit while actively managing traffic loads to maintain a higher level of service (LOS).
- Accommodate the future addition of an all-purpose lane and a high-occupancy vehicle lane in each direction on I-5.



Proposed Project

## Project Benefits

The Tulalip Tribes, along with Snohomish County and the City of Marysville, have for over the last decade recognized the pressing need to replace the existing 116th Interchange with an option that provides improved safety, more capacity, less congestion, and pollution, and better “transportation” options (for people AND fish). The selected SPUI design and interchange construction program has been shown to have the best combination of lower cost, increased speed of construction, improved long-term safety and level of service, environmental impact avoidance and mitigation, and enhancements to local community livability. The careful analysis already conducted for the new interchange shows that for every dollar invested in the new design and construction, \$29 will be generated in direct benefits:

- \$1.7 billion in direct economic output
- \$62.8 million in societal cost reductions due to reduced number of accidents
- \$68.5 million in user delay savings
- \$1.7 million in reduced greenhouse gas emissions

The analysis detailed in the *Economic Competitiveness* section of this application demonstrates that the new 116th Interchange will have significant positive impacts on local and regional employment opportunities and economic growth. This is particularly important as the northern Snohomish County area is more economically distressed than other areas of Western Washington. This is demonstrated by higher than average unemployment rates and lower than average incomes compared to other areas of the Puget Sound region. For example, for Tulalip tribal members, the poverty rate is over double the U.S. average, and median household income is 76% of the U.S. average. The Tulalip Indian Reservation is classified as an “Economically Distressed Area,” with poverty rates more than four times the Snohomish County average, and median household income at only 60% of the county average. Additional details can be found in the *Job Creation and Economic Stimulus* section of this application.

The new 116th Interchange is expected to unlock \$2.8 billion in overall economic activity. The project will directly provide 1,100 construction-related jobs, and support an additional 7,000 new permanent jobs in the northern Snohomish County area (including the City of Marysville and the Tulalip Indian Reservation). These economic benefits are complimented by significant upgrades to pedestrian, bicycle, and other new east-west transportation options; and major improvements to salmon and stream habitats in the area. These attributes and outcomes are detailed in the balance of this grant application. A project website has also been created to monitor progress towards the goal of completing the project by the end of 2012.

## PROJECT PARTIES

The Tulalip Tribes will be the recipient of this TIGER grant. Other key participating jurisdictions and agencies include the Washington State Department of Transportation (WSDOT), City of Marysville, Snohomish County, Federal Highway Administration (FHWA), and the Bureau of Indian Affairs (BIA). The activities of these jurisdictions are detailed elsewhere in this application.

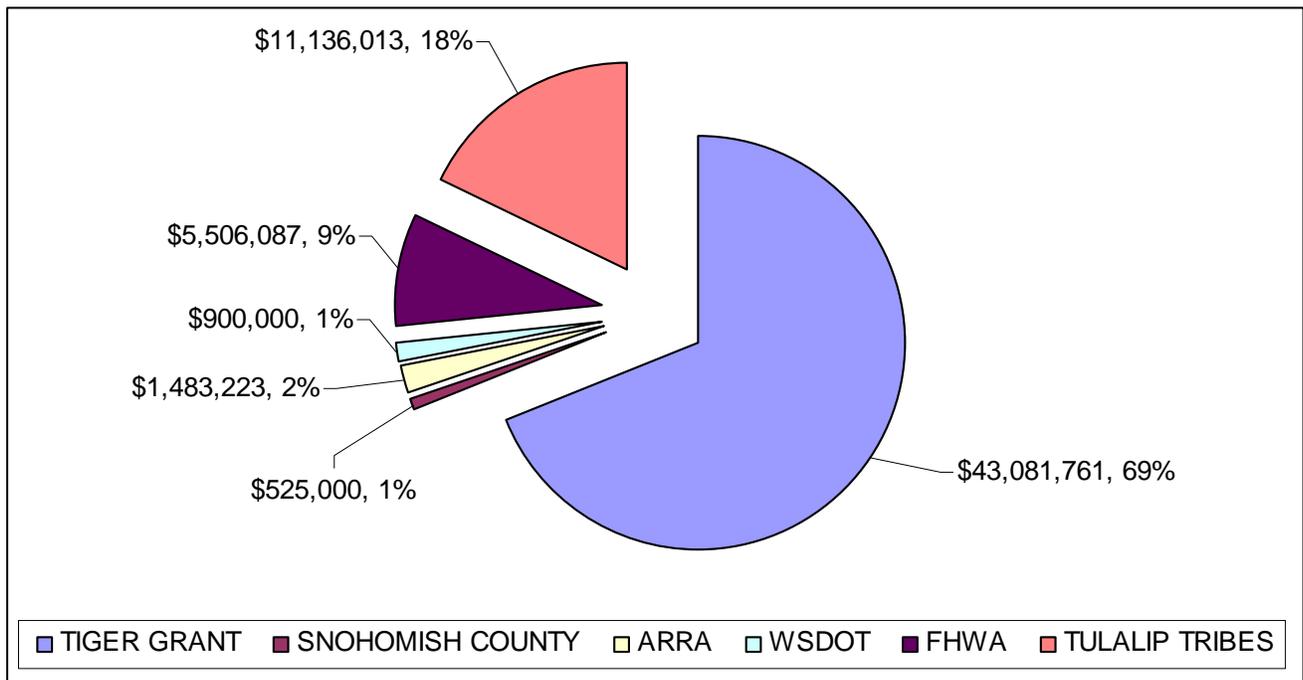
## GRANT FUNDS AND SOURCES AND USES OF PROJECT FUNDS

As shown below, an investment of \$17.6 million has already been made in the project, leaving a cost to complete of \$45 million. The remaining costs include \$3.85 million (\$1.9 million of this is already funded) for final design and construction ready documents and \$41.15 million for construction costs. The requested funding from the TIGER Program is \$43.1 million and will complete the funding package for the project.

### Project Funds Expended and Required to Complete

	Total Cost	Expended to Date	Remaining Cost to Complete
Planning	\$4,112,951	\$4,112,951	---
Engineering	\$5,790,627	\$1,940,627	\$3,850,000
ROW	\$550,000	\$550,000	---
Construction	\$52,178,505	\$11,028,505	\$41,150,000
<b>TOTAL</b>	<b>\$62,632,084</b>	<b>\$17,632,084</b>	<b>\$45,000,000</b>

### Parties Providing Project Funds



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Value engineering was completed in 2007 to determine the methods by which the 116th Interchange project could be the most cost-effective. The cost estimates for this TIGER grant application are highly reliable:

- Right-of-way analysis needs has occurred and been certified.
- Environmental impacts have been analyzed, mitigation has been identified in the Environmental Assessment (EA) and a Findings and Order of No Significant Impacts (FONSI) has been issued and accepted by regulatory agencies.
- Environmental mitigation and right-of-way acquisitions are completed.

The Tulalip Tribes are familiar with the complexities and contingencies of grant funding. The Tulalip Tribes have a long history of successfully managing Federal grant funds, having been awarded millions in the past 10 years, and passing every audit. The Tribes have the resources necessary to manage the cash flow between construction expenditures and grant funding reimbursement.

## **SELECTION CRITERIA**

### **1. Primary Selection Criteria**

#### **(a) Long-Term Outcomes**

##### **(i) State of Good Repair**

The existing diamond interchange will be replaced with a Single-Point Urban Interchange (SPUI) to improve safety, reduce congestion and increase thoroughfare capacity on I-5 and 116th Street NE. The existing diamond interchange has several deficiencies including inadequate capacity to meet the high level of commercial and commuter traffic. These deficiencies create negative impacts to local, regional, and international economies by disrupting both the international and regional flow of goods and services, increasing greenhouse gas emissions as vehicles idle, and generating safety risks as traffic queues back onto I-5's mainline.

##### **Service Deficiencies**

The existing 116th Street Interchange was designed and built in 1971, at a time when the Tulalip Indian Reservation, the City of Marysville, and northern Snohomish County had significantly fewer residents and businesses, and was largely rural in overall character. The Puget Sound Region's "tech" boom over the last 20 years has driven property values significantly higher in metropolitan centers like Seattle, Bellevue, and Redmond, motivating many residents of those cities to relocate to communities such as those surrounding the 116th Interchange. The expansion of the Boeing plant in nearby Everett, and the continued need for housing generated by the Everett Naval Station have also contributed to increased population and traffic volumes. Marysville's population has grown, for example, at an annualized rate of more than 26% since 2000.<sup>1</sup>

With major increases in area population, and traffic volumes on I-5 and over and through 116th Street NE, the existing 116th Interchange is now operating above design capacity, causing congestion and lengthy delays during peak traffic hours. The combination of traffic volumes and the inefficiencies caused by closely spaced dual signals at the 116th Interchange cause back-ups at the I-5 off-ramps, increasing traffic delays and posing safety risks on both the interchange and the I-5 main line. On-ramps release vehicles onto I-5 in a sporadic and unmetered manner, which causes additional congestion. The current 116th Interchange also has little or no infrastructure accommodating carpooling or public transit, nor does it adequately support east-west pedestrian and bicycle use.

##### **Functional, Operational, and Structural Deficiencies**

The current 116th Interchange structure and ramps have substandard and American Association of State Highway and Transportation Officials (AASHTO)/WSDOT non-compliant components, contributing significantly to congestion and excessive vehicle idling, which in turn increase greenhouse gas emissions and adversely impair economic activities in the area.

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<sup>1</sup> <http://www.bestplaces.net/City/Marysville-Washington.aspx>

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These include:

- Across the interchange, 116th Street NE is only three lanes, but connects five-plus lane sections east and west of the interchange. This creates a bottleneck contributing to congestion.
- Lack of adequate left and right turn lane storage on 116th Street NE to the on-ramps backs up traffic east and west of the interchange and onto the I-5 off-ramps.
- Lack of I-5 off-ramp left and right turn lane storage backs up traffic onto the I-5 mainline.
- The interchange has no active stormwater treatment systems, allowing untreated stormwater runoff to enter endangered salmon and steelhead bearing Quilceda Creek and adjacent wetlands and riparian areas.
- The existing bridge structure does not meet current bridge seismic design standards. It was designed for a 500-year seismic event; the current WSDOT standard is 1,000 years.
- The existing bridge structure was designed as a two-lane bridge and now carries three lanes of live loading of cars and trucks.
- There is a lack of full pedestrian and bicycle accommodation through the interchange or connecting to similar facilities on surface approach roads. There is only a 6-foot sidewalk on the north side, and ramp terminal intersections are not ADA compliant.



*The current configuration lacks full pedestrian and bicycle paths.*

### **Life Cycle**

AASHTO sets the effective life of a prestressed concrete bridge structure (like the existing 116th Interchange) at 75 years. Based on this standard, the remaining life of the 116th Interchange would be 35 years. However, subsequent changes in standards (such as for stormwater management and bicycle/pedestrian facilities), and the high traffic volumes generated by major population and traffic growth in and through the area, have effectively brought the current 116th Interchange to the operational end of its design life.

### **Operations and Maintenance**

WSDOT operates and maintains the 116th Interchange bridge structure. With the improvements proposed with this TIGER application, operation and maintenance (O&M) costs for the new SPUI structure will be lower than for the existing diamond interchange. *Note: Stormwater treatment improvements will incur slightly higher O&M costs, essentially because current stormwater treatment is non-existent or incidental (sheet run-off to adjacent disturbed lands). The benefits of the active treatment incorporated in the new design more than offset the higher base O&M expense. Stormwater management provisions are described under the Sustainability section of this application.*

### **(ii) Economic Competitiveness**

#### **Existing Conditions AND Critical Need – Major Local Drivers**

A new 116th Interchange will support major employment centers in the area, and unlock the potential for expanding on existing developments and creating new opportunities. One potential initiative that will be facilitated by a new interchange is the planned [University of Washington North Sound Campus](#). Snohomish County is the largest county in the United States without a 4-year university. The University of Washington has proposed a North Sound campus, which will bring accessible 4-year educational opportunities to the area. One of the two finalist sites is 1.5 miles north of the 116th Interchange. The estimated value of the new campus is between \$600 and \$800 million, with an anticipated capacity for 5,000 students.

Other major economic drivers in the immediate project vicinity that will directly benefit from proposed improvements to the 116th Interchange are summarized in the following table and Figure 1.

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## Local Economic Drivers for Project

Driver	Description
<a href="#">Boeing</a>	The Boeing Company has its primary factory location in Everett, approximately 13 miles from the 116th Interchange. The factory is the largest building in the world (by volume), covering over 1,025 acres. Thousands of Boeing employees live near the immediate vicinity of the 116th Interchange and use it on a daily basis.
Naval Station Everett	Naval Station Everett is the homeport for several important U.S. Navy vessels, including a nuclear aircraft carrier. Five percent of all economic activity in Snohomish County is linked to personnel and procurements at this base.
<a href="#">Consolidated Borough of Quil Ceda Village</a>	The Tulalip Tribes have invested over \$81 million on the Quil Ceda Village Business Park, west of the 116th Interchange, to develop and support infrastructure, including roads and utilities, hotels, large retail, smaller shops, professional and government services, and entertainment venues. 180 acres have already been developed in the 2,000 acre Business Park, and several 100 more acres will be leveraged by the new interchange.
Kruse-Junction Marshall Area	Located on the east side of I-5, the City of Marysville has developed or permitted over 1.6 million square feet of built or planned commercial space. All this activity is occurring within 2 miles of the 116th Interchange.
Lakewood Triangle	A 2006 annexation by the City of Marysville unlocked the potential development of a 500,000 sf retail and light commercial opportunities. This development area is 2 miles northwest of the 116th Interchange.
<a href="#">Smokey Point Master Planned Community</a>	The City of Marysville is investing in infrastructure to support development of 675 acres of light commercial and industrial development. The 116th Interchange is a primary regional access point. The development is 2 miles northeast of the 116th Interchange.

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### Existing Conditions and Critical Need – Interstate 5 Corridor

The foregoing economic drivers are vital to the economic competitiveness of the [Tulalip Tribes](#) and [City of Marysville](#), but the 116th Interchange also plays a large role in regional economic competitiveness. I-5 is a vital route to Sea-Tac International Airport, and the ports of Seattle, Tacoma, and [Everett](#). Tacoma and Seattle are among the top ten U.S. containership ports<sup>2</sup> and the I-5 corridor is home to five of the top ten U.S. ports by volume.<sup>3</sup> Furthermore, \$87 billion, or 62%, of Washington's freight shipments are by truck within the state<sup>4</sup>; these shipments rely heavily upon I-5. An average 46 million tons of freight and 11,000 trucks pass through the 116th Interchange daily. In addition, major medical, educational, government, military and cultural venues lie along the I-5 corridor. A new 116th Interchange will greatly speed the movement of goods and people up and down I-5.

### Existing Conditions and Critical Need – International Trade

Congestion at the 116th Interchange has the effect of stifling the flow of goods between regional and international trade centers, resulting in lost productivity. As noted elsewhere in this application, I-5 is the primary north-south transportation route in Washington State, connecting it with Canada, Oregon, California and Mexico. Commercial truck traffic across the Washington State/British Columbia border has been increasing since the implementation of the North American Free Trade Agreement (NAFTA) in 1994. U.S. trade with Canada has steadily increased from \$243 billion in 1994 to \$406 billion in 2000, an annual growth rate of 8.9%. During a similar time period, freight truck traffic in Washington State increased by 94% along

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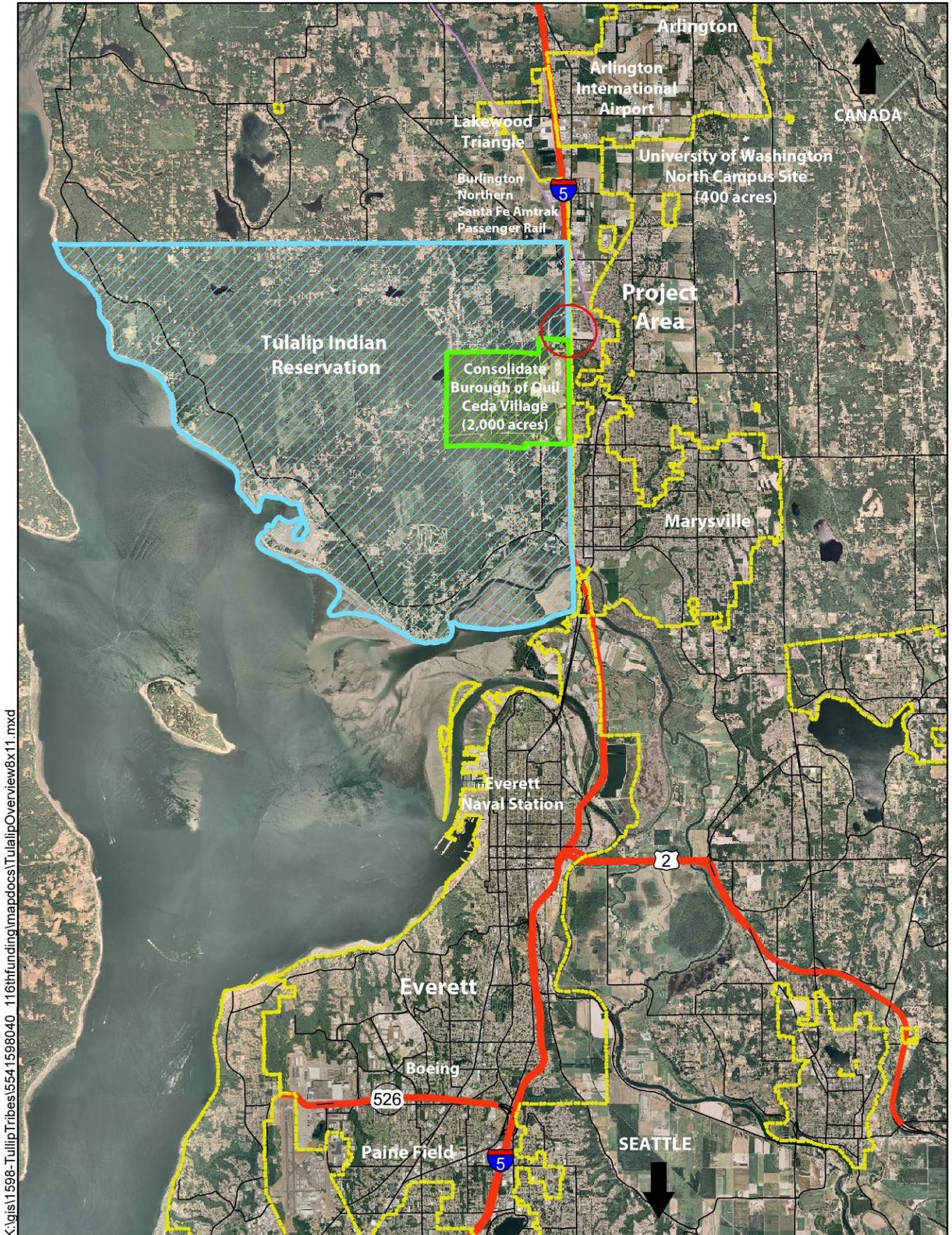
<sup>2</sup> [http://www.bts.gov/publications/state\\_transportation\\_statistics/state\\_transportation\\_statistics\\_2004/](http://www.bts.gov/publications/state_transportation_statistics/state_transportation_statistics_2004/)

Tacoma ranked #9 in 2003, importing 594,000 twenty-foot equivalent units [TEUs] and exporting 337,000 TEUs for a total of 931,000 TEUs. Seattle ranked #10 in 2003 importing 486,000 TEUs and exporting 329,000 TEUs for a total of 815,000 TEUs.

<sup>3</sup> Los Angeles #1, Long Beach #2, Oakland #7, Tacoma #9 and Seattle #10

<sup>4</sup> [http://www.ops.fhwa.dot.gov/freight/freight\\_analysis/faf/state\\_info/faf2/pdfs/wa.pdf](http://www.ops.fhwa.dot.gov/freight/freight_analysis/faf/state_info/faf2/pdfs/wa.pdf)

Figure 1. Location of Project in Relation to Economic Hubs



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I-5<sup>5</sup>. Two-way trade at I-5's Blaine, Washington border crossing (76 miles north of the 116th Interchange) was valued at more than \$35 million per day in 2000.<sup>6</sup> The portion of Washington's trade that is international (29% in 2002) is anticipated to grow steadily to 37% by 2035.<sup>7</sup>

### Population Trends and Critical Need

According to the [Puget Sound Regional Council](#) (PSRC), the population of [Snohomish County](#) will grow by approximately 350,000 in over the next 30 years. Traffic congestion and lack of economic development opportunities will inhibit this growth. The new 116th Interchange will accommodate and advance this significant population growth, and more importantly encourage private investments in local and regional economic expansion supporting these new residents.

### Adopted Local and Regional Growth Projections

Location	Population	Employment Opportunities
Snohomish County 2010	733,732	249,152
Snohomish County 2040	1,084,068	407,338
PSRC 4-County 2010	3,695,516	1,934,713
PSRC 4-County 2040	4,988,135	2,789,293

### Additional Critical Needs

There are two other significant factors associated with the 116th Interchange project that merit special consideration in assessing the need for TIGER funding for this project. These two factors significantly reduce the discretionary tax revenues available to local jurisdictions, effectively reducing local ability to undertake or contribute to infrastructure projects:

- The Tulalip Tribes do not receive redistribution benefits from state sales tax revenues, even as businesses within the Tulalip Reservation contribute millions of dollars per annum in sales tax receipts.
- There are large military installations (especially the [Everett Naval Station](#)) in the near vicinity of the 116th Interchange. These installations, critical to national security and supportive of commercial economic interests, nonetheless impact local and regional infrastructure (such as 116th Street NE) without directly supporting local tax revenues to cover such impacts.

### Employment Related Benefits

Changes in levels of economic activity (measured as changes in output, income, and employment) associated with the replacement of the 116th Interchange is derived from the future development of currently undeveloped land near the interchange. This additional development would be inhibited by the current 116th Interchange particularly due to congestion factors. The new 116th Interchange would both negate these congestion problems and contribute significantly to the development of 675,000 square feet of retail space and four million square feet of light industrial and warehousing space in the area. The total economic impacts of a new 116th Interchange will be the sum of the *direct*, *indirect* and *induced* benefits of this unlocked development. For Snohomish County, total 116th Interchange economic benefits are projected at 13,676 jobs, \$2.8 billion in output, and \$892 million in income.

The *direct* impact of this projected development will be 1,338 new retail jobs, 3,231 manufacturing jobs, and 2,341 warehousing jobs, *for a total of 7,000 direct new jobs in Snohomish County*. These direct jobs correspond to \$128 million per year in retail output, \$1.2 billion in manufacturing output, and \$401 million in transportation and warehousing output. Direct income to retail workers is \$52 million per year, to manufacturing workers \$323 million, and to warehousing workers \$143 million.

<sup>5</sup> [http://www.bts.gov/publications/state\\_transportation\\_statistics/state\\_transportation\\_statistics\\_2004/](http://www.bts.gov/publications/state_transportation_statistics/state_transportation_statistics_2004/)

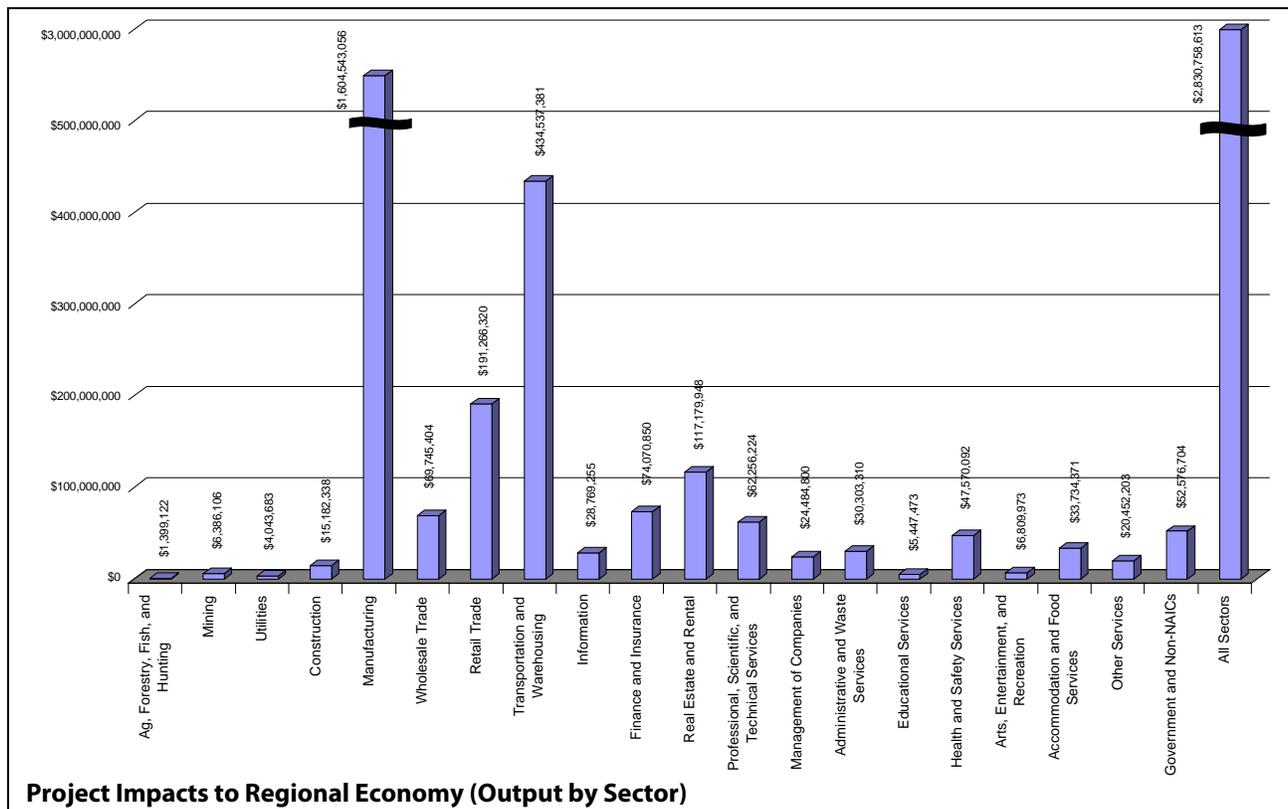
<sup>6</sup> <http://www.ops.fhwa.dot.gov/freight/documents/pacificnw.pdf>

<sup>7</sup> [http://www.ops.fhwa.dot.gov/freight/freight\\_analysis/faf/state\\_info/faf2/pdfs/wa.pdf](http://www.ops.fhwa.dot.gov/freight/freight_analysis/faf/state_info/faf2/pdfs/wa.pdf)

## Direct Impacts of Projected Development

Direct Impacts Aggregate Industry Sector	Snohomish County		
	Direct Output	Direct Income	Direct Jobs
Manufacturing	\$1,205,264,128	\$322,682,688	3,321
Retail trade	\$128,160,392	\$52,552,768	1,338
Transportation & warehousing	\$401,251,040	\$143,050,368	2,341
<b>All Sectors</b>	<b>\$1,734,675,560</b>	<b>\$518,285,824</b>	<b>7,000</b>

*Indirect* impacts result from the directly-affected businesses purchasing goods and services from other businesses within the region. The indirect impacts of development unlocked by a new 116th Interchange amount to 3,129 additional jobs, \$641 million in output, and \$210 million in income within Snohomish County. *Induced* impacts result from employees of directly- and indirectly-affected businesses spending their incomes. The induced impacts of a new 116th Interchange are 3,547 additional jobs, \$455 million in output, and \$164 million in income (again, solely within Snohomish County). Total projected revenues to the regional economy by sector as a result of the project are summarized below.



The foregoing employment and income benefit projections relate to Snohomish County, the “home” county for the 116th Interchange, and the most direct beneficiary of a new interchange (along with the Tulalip Reservation and City of Marysville, both included in the overall County projections). However, as noted earlier in this section, I-5 is the major land transportation corridor linking the Puget Sound Region and Western Washington. Therefore, it is reasonable to assume the new 116th Interchange will contribute to economic stability and growth well beyond County boundaries. The table below shows the projected additional increments of indirect and induced growth in the Puget Sound Region as an outcome of the new development unlocked by the 116th Interchange.

### Puget Sound Impacts, by Type, in 2009 Dollars

Type of Impact	Direct	Indirect	Induced	Total
Output	\$1,734,675,560	\$784,114,990	\$583,841,231	\$3,102,631,781
Income	\$518,285,824	\$273,160,112	\$220,434,657	\$1,011,880,593
Jobs	7,000	3,797	4,380	15,177

In estimating the impacts and benefits attributable to the 116th Interchange, the *IMPLAN* economic input-output model was applied. The impacts shown above are long-run impacts as of the *completion of the planned development*. All dollar amounts are in 2009 dollars. These economic impacts do not include the short-run impacts of the construction itself. Such benefits are described under the *Livability* section of this application. Assumptions made in deriving the growth projections include:

- Retail space would employ 1.982 people per 1,000 square feet, the warehousing would employ 0.915, and the light industrial would employ 2.308.
- The four million square feet of light industrial and warehousing would consist of 1,437,000 square feet of light industrial and 2,563,000 square feet of warehousing space.
- Jobs are person-years of employment per year.
- All growth and development assumptions have been developed in the context of, and are consistent with, adopted Tulalip Tribes long range plans, and other applicable local, regional, and state plans.
- Economic benefits has been calculated for a 30-year project period (assuming the 116th Interchange is completed in 2012, the analysis runs to 2040). The new 116th Interchange infrastructure could have a design life of more than twice this period. Thus, lifecycle economic benefits of the new 116th Interchange are likely to be more significant than those described.

### Direct Congestion-Related Impacts: User Delay Benefits

The 116th Interchange is needed to reduce congestion on I-5 and to support planned development in the Tulalip Reservation, City of Marysville and Snohomish County. A User Benefit Analysis has been conducted that projects the value of time savings to users of a new 116th Interchange. The present value, in 2009 dollars, of user delay reductions created by the new 116th Interchange is \$68.5 million when discounted at a 7.0% real discount rate. At this discount rate, the total project design and construction cost (\$62.6 million) is effectively offset with just this single factor.

### Economic Benefits Associated with Reduced Congestion at 116th Interchange

Time Period	Value @ 7.0 % Discount Rate
2012-2021	\$15,350,000
2021-2030	\$32,250,000
Through 2040	\$68,500,000



*The project will greatly reduce existing congestion in the area.*

The preceding data do not include additional benefits that will accrue to interchange users through reduced operating costs, the value of time savings to users on the I-5 main line when traffic on the existing interchange backs up into the main line, or the inventory value of reduced freight delay. Those benefits will be positive, but much smaller than the user delay benefits, and have not been estimated. The user benefits discussed in this application are therefore almost certainly lower than actual total user benefits. Safety and emissions benefits are reported separately in other sections of this application.

To estimate user delay benefits, available *Synchro* model runs were used that simulate the operation of the 116th Interchange in the peak hour of a typical weekday. Synchro models were run for the existing interchange and the proposed interchange in 2012, 2030, and 2040. These model runs estimate the number of seconds it takes a vehicle to traverse each link along their path through the interchange. The difference in travel time between the without- and with-improvement cases were multiplied by the number of vehicles on that link and converted the result from seconds to hours. The hours over all links were added to get the hours of user delay benefits in the PM peak hour of a typical weekday. Those savings area 71.46 hours in 2012, 441.53 hours in 2030, and 1305.86 hours in 2040. Because of the non-linear relationship between traffic volume and delay from congestion, the hours of delay increase faster than traffic volumes.

Methods and formulas from the AASHTO *User Benefit Analysis for Highways Manual* were used to extrapolate delay from the peak hour to the entire day and then to the entire year. This yields 54,966 hours of delay savings in 2012, 339,635 hours in 2030, and 1,004,512 hours in 2040.

To get from hours of benefit to dollars, we used the assumptions regarding how interchange users value their time, as found in the travel-demand model maintained by the Puget Sound Regional Council. Vehicle occupancy during congested times was set at 1.1 persons per vehicle, and for years between the years for which the model was run (see dates above), user delay benefits (in hours) were interpolated assuming a constant rate of growth. To compare the stream of benefits to the cost of the 116th Interchange improvements that will produce those benefits, the benefits were adjusted to present (2009) values. The outcomes of these calculations are shown in the first paragraph of this subsection. The discount rate used is 7.0%, which is mentioned directly in the Federal Register Notice regarding TIGER Grants. This rate is not reflective of current economic conditions and is a very conservative assumption.



*I-5 off-ramp backups.*

The 2009 value of reducing greenhouse gas emissions as a result of the new 116th Interchange is \$1.7 million (discounted at a 7.0% rate).

### **Direct Congestion-Related Impacts: Greenhouse Gas Benefits**

Using the same Synchro model runs as with user delay benefit calculations, greenhouse gas emission reductions resulting from the new 116th Interchange were calculated based on factors such as reduced stopping, idling, and accelerating, and more optimal vehicle speeds. Annual reductions in emissions were valued at \$33 per metric tonne (\$30 per U.S. ton) in year-2009 dollars and discounted to present value using the same discount rates as in the user delay benefits analysis. Greenhouse gas emissions would be reduced by 919 metric tonnes in 2012, 7,871 tonnes in 2030, and 14,555 tonnes in 2040. Further details can be found in the *Sustainability* section of this application.

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### **(iii) Livability**

#### **Enhances User Mobility through Creation of More Convenient Transportation Options**

The new 116th Interchange will provide several significant new transportation options for residents and businesses throughout Snohomish County, the City of Marysville and the Tulalip Indian Reservation. These new transportation options will contribute to reduced congestion and greenhouse gas emissions, and for the *first time* offer convenient and direct multiple options for area residents and visitors to move between the east and west sides of I-5 without resorting to the automobile.

#### **Pedestrian and Bicycle Facilities**

The current 116th Interchange has a single (average 6-foot width) sidewalk that must accommodate both pedestrians and bicyclists. This limited facility is unsafe for motorists as well as pedestrians and bicyclists, and simply too narrow for even nominal low volume, two-way, multi-modal use. The relatively short trip (approximately 0.5 mile) from Marysville's eastside 116th/State Street commercial district (and nearby residential neighborhoods) to the considerable commercial and recreational opportunities at the westside's Tulalip Quil Ceda Village is at present *only* possible by automobile (except for this single sidewalk). Quil Ceda Village includes the 130-store Seattle Premium Outlets (drawing customers from as far as British Columbia); a wide range of specialty independent retail, galleries and restaurants; medical/dental and other services; national brand stores such as Wal-Mart and Home Depot, and the 2,200 seat Tulalip Amphitheatre. Tribal government offices are also in this area. Eastside commercial services in Marysville include the Gateway Shopping Center, Winco, and Kohl's.

The nearest full service pedestrian/bicycle "friendly" I-5 crossovers are at the Smoky Point Interchange, approximately 4 miles to the north, and the 4th Avenue Interchange, 3 miles to the south. *Note: Bicycle/pedestrian facilities at the 88th Avenue Interchange (2 miles south) are limited to a single 4-foot wide sidewalk.* Upgrading the 116th Interchange crossing for pedestrians and bicyclists will allow local and regional

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customers originating from the eastside of I-5 to conveniently and safely choose between multiple travel options in patronizing the burgeoning westside commercial and recreational areas, and vice versa. The 116th Interchange will include the following pedestrian and bicycle facilities:

- Six-foot wide raised sidewalks on both sides of 116th Street bridge structure over I-5. Sidewalks and ramps will be upgraded to be ADA compliant.
- Four-foot wide outside travel lanes both eastbound and westbound on the 116th Interchange structure over I-5 to accommodate bicycle use.
- Connections to similar facilities along 116th Street NE in Marysville and those in the Tulalip Reservation's Quil Ceda Village.

### **Off-Road Shuttle Service**

In addition to the bicycle lanes and pedestrian sidewalks incorporated directly into the 116th Interchange, a second innovative transportation option will be accommodated within the footprint of the project. A cooperative effort of local area governments is underway to establish a new train station on State Street just south of 116th Street NE in central Marysville. Presently, the region's commuter rail stops short south of Marysville in the adjacent City of Everett. Amtrak's Eugene, Oregon to Vancouver, BC *Cascades* service passes through but does not stop in Marysville. The new station will disembark both commuter rail and Amtrak passengers from all over the west coast of the U.S. and Canada.

The Tulalip Tribes presently own the property between the train station site and I-5. The Tulalips also own an out-of-service but structurally intact rail bridge that crosses I-5 over the planned southern off- and on-ramps for the new 116th Interchange. The Quil Ceda Village commercial development sits opposite on the westside of I-5. All elements (train station, eastside properties, the rail bridge, and the Village) are along the same half-mile long east-west axis. The Tulalip Tribes will be developing a shuttle system along this axis that will also be designed to accommodate intermediate stops for local residents and businesses. The type of shuttle vehicle to be used (wheeled bus, lorry type or rail trolley) is still to be determined, but will feature low or no-emission technologies. The shuttle will be an innovative, low impact, and highly accessible addition to the major expansion in transportation options through the new 116th Interchange.

### **Transit Park and Ride**

The new 116th Interchange also includes the retention of an existing 57-space transit park-and-ride in the northwest quadrant of the interchange. The extension of Quil Ceda Boulevard in an earlier phase of this project included a new roundabout and frontage road specifically to retain access to the park-and-ride. The Tulalip Tribes recently submitted an application for funding under ARRA's Tribal Transit Program to extend transit service between Quil Ceda Village, this park and ride, and the heavily-populated commercial and residential areas in central Marysville.

### **Improves Transportation Choices by Reducing Congestion**

Livability benefits of the 116th Interchange project relating to congestion reduction will provide significant reductions in delay and queuing (for additional benefits, see the *Economic Competitiveness and Sustainability* sections of this application). The existing northbound ramps and 116th Street NE form the most critical intersection of the interchange, and carry approximately 2,500 PM peak-hour trips (25,000 average daily trips [ADT]). [WSDOT](#) has established Level of Service (LOS) D as its acceptable level of service on highways of state-wide significance, such as I-5. Analysis shows the current 116th Interchange already operates below the threshold at LOS E for the critical approaches, with long queue lengths and high accident rates. Traffic exiting I-5 backs up into I-5 travel lanes, with queues during peaks extending over 1,000 feet long. Queues will be reduced down to a low as 300 feet, eliminating backup into I-5 (and thus will also eliminate a major safety hazard).

Additional development in the vicinity will further degrade LOS, with queues extending further into the I-5 mainline and increasing the probability of accidents. The proposed SPUI interchange will allow the critical approaches to operate within LOS D levels and have significant queuing benefits up to approximately 4,000 PM peak-hour trips (40,000 ADT) through the intersection. The project will provide the capacity for an additional 1,500 PM peak-hour trips (15,000 ADT) and still stay within acceptable LOS limits.

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Average vehicle delay at the 116th Interchange will be reduced from 10 minutes to 54 seconds in 2040. Additionally, because the queues from the current interchange back up through adjacent signals, the overall system delay reductions from a new 116th Interchange would be 71.46 hours in 2012, 441.53 hours in 2030, and 1,305.86 hours in 2040.

These improvements will be accomplished by reconfiguring and rebuilding the 116th Interchange and associated roadways as follows:

- An SPUI with all ramp terminals combined into a single signalized intersection will be created and existing on- and off-ramps realigned.
- Through-lanes on the 116th Street NE across the bridge over I-5 will be expanded from two to four, plus four corresponding left turn lanes.
- On the eastside of I-5 in Marysville, 116th Street NE is currently five lanes with two through lanes in each direction. The new 116th Street NE section at the interchange will be expanded to match the existing surface street.
- On the westside of I-5 in Quil Ceda Village, 116th Street NE is currently four lanes and will be tied back to the new interchange four-lane section. A continuous left turn lane will be added.
- Quil Ceda Blvd has already been extended in a prior phase to provide better north-south arterial circulation on the westside, allowing removal of signalization at the 34th Avenue/116th Street NE intersection (this signal conflicts with ramp signalization and contributes to excessive queuing).
- All 34th Avenue NE traffic will be diverted to the new Quil Ceda Boulevard Extension. Through and left turn movements onto and from 116th Street NE will be eliminated.
- Southbound on-ramp improvements will include an HOV bypass lane and ramp metering.
- Bike lanes and pedestrian sidewalks will be included in the 116th Street Interchange bridge, connecting to surface streets at both ends.
- Monitoring cameras and message signs will be incorporated to provide information to motorists and to highway officials anticipating and reporting problems.

### **Improves Transportation and Transport Services to Disadvantaged, Non-drivers, or Makes Goods More Readily Available to Same**

The new 116th Interchange will directly serve the Tulalip Indian Reservation to the west and the City of Marysville to the east, as well as surrounding areas of Snohomish County. Both the direct transportation improvements associated with the 116th Interchange project, and the economic impacts in terms of unlocked development and employment (documented elsewhere in this application under *Economic Competitiveness*), will have significant positive impacts on the area's disadvantaged populations.

All disadvantaged populations will benefit from the availability of a wider range of choice and services as a result of the new 116th Interchange. The full range of travel modes accommodated in this project will speed movements between both sides of I-5, providing ready access to existing services. The improved vehicular connections from and over I-5, and new pedestrian, bicycle, and shuttle systems, will make an immediate and dramatic difference in choice for such populations. As documented under the *Economic Competitiveness* section of this application, the development and employment unlocked by the project will also generate new services.

The residents of the Tulalip Indian Reservation provide a compelling example of how nearby disadvantaged populations that will benefit from the new 116th Interchange. Of the 4,000 members of the Tulalip Tribes, 2,600 live on the Reservation, with approximately 500 more in surrounding Snohomish County. Total population within the Reservation is over 10,000. The median annual household income of tribal members living on the Reservation is under \$32,000 (2000 U.S. Census). With a poverty rate of over double the U.S. average and a median household income of 76% of the U.S. average, the Tulalip Reservation is classified as an "Economically Distressed Area." The poverty rate for American Indians at Tulalip is more than four times the Snohomish County average, and the median household income is only 60% of the county average.

Specific benefits of the new 116th Interchange to disadvantaged and other special populations include:

- **Economically disadvantaged:** Development unlocked by the 116th Interchange project (see *Economic Competitiveness*) will provide wider and more numerous employment opportunities, and higher wage jobs. The sum of the overall interchange improvements will also lessen local travel distances

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(and expense) and particularly allow for non-vehicular choice in shopping, getting to school, getting to work, entertainment, and accessing essential services.

- **Non-drivers:** Benefits to non-drivers will be immediate and direct. Presently those wishing to walk or bike the approximate one-half mile between Tulalip and Marysville commercial centers have only a single 6-foot wide sidewalk to do so. Circuitous seven to nine mile routes over distant I-5 interchanges are the shortest alternatives.
- **Senior citizens:** Elder residents of the City of Marysville and the Tulalip Indian Reservation face the same challenges as their contemporaries across the region—reduced incomes, challenging physical condition, and restricted mobility. The positive *Economic Competitiveness* and *Livability* impacts of the 116th Interchange project, as discussed in this application, will greatly expand opportunity and choice for seniors.
- **Persons with disabilities:** Persons with disabilities exhibit much the same profile as senior citizens, and will accrue much the same benefits from the 116th Interchange project. Both seniors and those with disabilities will also benefit from the planned State Street to Quil Ceda Village shuttle.

### **Result of a Coordinated Transportation/Land Use Process and Community Involvement**

The 116th Interchange is identified as a priority in several area land use and transportation plans, including those of the Tulalip Tribes, City of Marysville, Snohomish County, WSDOT and the Puget Sound Regional Council. The priority for completing the new 116th Interchange through the TIGER program has been specifically endorsed by the local cities of Marysville and Arlington, and Snohomish County.

Various parties have already invested \$17.6 million in the early phases of the 116th Interchange. Agency coordination and community outreach was conducted in each phase. An Environmental Assessment (EA) was prepared under NEPA and a Finding of No Significant Impact (FONSI) completed in February 2006. The EA process included the required range of public involvement and comment, and agency consultation, during scoping, alternative identification, human and natural environment impacts analysis, alternative selection, and the FONSI.

#### **(iv) Sustainability**

##### **Improves Energy Efficiency, Reduces Oil Dependence and Reduces Greenhouse Gas, Decrease in Movement by Less Energy Efficient Means**

###### **Energy Efficiency/Reduced Oil Dependence**

The congestion reduction benefits of the new 116th Interchange are discussed in detail under the *Economic Competitiveness* section of this application. Particular emphasis is given in that section to the value of reduced driver delays and greenhouse gas emissions, but reductions in oil consumption will also be realized from shorter idling time, and by vehicles operating at more optimal speeds (as well as from drivers simply leaving their vehicles parked – see the *Livability* section of this application discussing significantly improved bicycle and pedestrian facilities).

###### **Reduced Dependence on Less Energy Efficient Means**

The new 116th Interchange will directly provide significant improvements in the form of safer, more direct, and more convenient pedestrian and bicycle options for area residents and shoppers. Presently, the one-half mile east-west movement for pedestrians and bicyclists across the existing 116th Interchange is restricted to a single 6-foot wide shared sidewalk. The more industrious can attempt circuitous travel north or south, logging from 7 to 9 miles just to end up a half-mile from where they started. Details of the 116th Interchange pedestrian and bicycle improvements can be found under the *Livability* section of this application.

###### **Greenhouse Gas Reduction**

The Tulalip Tribes have been committed to initiatives with respect to climate change and greenhouse gas reduction for at least the last decade. For example, the new Tribal Headquarters building is heated by clean renewable geothermal energy. The 116th Interchange will reduce greenhouse gas emissions and provide direct economic benefits from that reduction (see the *Economic Competitiveness* section of this application for additional details). In simplest terms, the new 116th Interchange will decrease greenhouse gas emissions by nearly 200,000 tonnes between 2012 and 2040.

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These greenhouse gas (GHG) emissions reduction calculations were made based on the reduction in emission associated with congestion-caused idling of combustion engines. An approximate cost of \$33 per ton of carbon dioxide equivalent (CO<sub>2</sub>e) has been applied to the reduction in emissions attributed to the proposed interchange improvements.

- The Build alternative decreases GHG emissions compared to the No Build (denoted by a negative delta) on the local network by approximately 208,550 mtonnes of CO<sub>2</sub>e between 2012 and 2040.
- The Build alternative increases GHG emissions compared to the No Build (denoted by a positive delta) on the freeway network by approximately 9,567 mtonnes of CO<sub>2</sub>e between 2012 and 2040.
- The net difference is that the Build alternative decreases GHG emissions compared to the No Build (denoted by a negative delta) on the local network by approximately 198,983 mtonnes of CO<sub>2</sub>e between 2012 and 2040.

### **Maintains, Protects or Enhances the Environment—by Avoidance (Air Quality, Endangered Species, Wetlands) or Enhancement**

Salmon and salmon restoration is central to the history and culture, and the contemporary goals, of the Tulalip Tribes. The Tulalip Tribes have been a leader in salmon restoration in the Pacific Northwest, investing many millions of their own funds and time in developing programs, providing education, supporting fisheries enhancements, and restoring habitat. The Tulalips have partnered with diverse agencies, non-profits and citizens in restoring salmon. The Tulalips in fact refer to themselves as *The Salmon People*.



*The Tulalip Tribes have previously restored sections of Quilceda Creek.*

The confluence of West Quilceda Creek and the mainstem Quilceda Creek is about 2 miles north of the project site. Quilceda Creek flows through the Tulalip Indian Reservation and the City of Marysville downstream of this confluence, and thence into the Snohomish River.

Endangered Chinook salmon and bull trout historically spawn within this watershed. Steelhead and rainbow trout are also historically and currently present. The West Fork stream and wetlands enhancements and stormwater improvements associated with the 116th Interchange project will improve the overall health of the Quilceda system, providing for resource quality uplift supporting increases in fish populations and the reappearance of now absent historic populations. This is an unusual outcome for a project centered on a major transportation improvement.

### **Salmon Habitat and Stream Restoration**

The Tulalip Tribes have committed to a significant restoration effort in concert with the 116th Interchange project, including improvements to fish passage and stream habitat for the West Fork of Quilceda Creek. The net impact of the habitat enhancement program will be significantly better in-stream and riparian habitat and fish passage. Habitat improvements will encompass 600 linear feet of the stream, and include restoring the historic stream channel, replacing culverts to improve fish passage, creating wetlands, and restoring riparian areas. New culverts under 116th Street NE and 34th Avenue NE will increase hydraulic capacity and reduce present floodplain and floodway restrictions (as well as improve fish passage).

The necessary NEPA Environmental Assessment (EA) has been completed and a FONSI issued (FHWA, BIA, and WSDOT acted as co-lead agencies). All 116th Interchange environmental improvements are in accordance with the assumptions and findings made in the EA. *Note: the existing box culverts under I-5 and the railroad embankment will not be replaced as part of this project. Both culverts were evaluated by the Washington Department of Fish and Wildlife (WDFW) and WSDOT and found to present no significant fish passage barrier.*

The importance of salmon recovery and stream quality to the Tulalip Tribes is further evidenced by the commitment to complete stream restoration in *advance* of the interchange (stream re-meander work commenced August 2009). Stream improvements also provide for net enhancements to the stream corridor, beyond that required by regulatory processes. For example, in the recent extension of Quil Ceda Boulevard, which is a functional component of the 116th Interchange design solution, this boulevard was rebuilt to bridge the stream. This solution keeps all road structures out of the stream channel, riparian area, and 100-

year floodplain. Cedar trees unavoidably removed as part of the road extension were re-used “on-site” to create new woody debris fish habitat.

Specific project environmental actions associated with the 116th Interchange project include:

- West Quilceda Creek is being realigned and lengthened to restore the natural stream meander and enhance stream function.
- Wetlands and riparian areas adjacent to the project will be restored, and wetlands created and enhanced upstream of the project site in an area of existing higher value riparian wetlands.
- Stream buffers, riparian trees, and wetlands will be retained wherever possible. All disturbed areas will be replanted with native vegetation, and trees.
- Highly invasive and persistent plant species (such as Japanese knotweed) will be removed in the southwest quadrant of the new interchange, and at the Quil Ceda Boulevard Extension associated with this project.
- A new shorter culvert spanning the realigned section of the creek will be installed as part of the associated 116th Street NE widening. This new system will be fully fish passable.
- The culvert under the associated 34th Avenue NE approach to the interchange will be replaced by a shorter culvert. This culvert will also be fully fish passable.



*New culvert and previous culvert, 116th Street NE.*

### **Wetlands Restoration and Mitigation**

Existing wetlands to be filled by the 116th Interchange project are limited to two small sites within the project’s footprint that are highly disturbed and that exhibit low plant diversity. Restoration of the 600 foot reach of West Quilceda Creek, and at the project’s upstream mitigation site, will provide for a slightly over 2:1 increase in wetland area and slightly over a 6:1 increase in buffer areas. The net increase in wetland *values* is even greater, as the project will replace degraded wetlands surrounded by interchange structures with higher function wetlands and buffers around a reach of Quilceda Creek north of the project site.

### **Stormwater Management**

The present 116th Interchange has no stormwater management facilities (either for quantity or quality purposes) beyond sheet runoff onto adjacent disturbed roadside vegetation. Most stormwater from the new 116th Interchange (accounting for about 60% of total run-off) will be conveyed to three new infiltration ponds within the footprint of the interchange. Bioswales and vaults will pre-treat stormwater prior to infiltration. Stormwater run-off from some new road sections appurtenant to the actual interchange structure/site will flow into adjacent vegetated areas. Overall run-off from the project will not impact peak flows or water quality in Quilceda Creek. The new stormwater system will infiltrate all treated run-off into the soil column.

The selected SPUI solution for the new 116th Interchange will also reduce the amount of impervious surface. Impervious surface coverage affects local hydrology, increasing stormwater runoff and non-point source pollution. The SPUI alternative was evaluated against other interchange layouts and found to require the least amount of surface area and impervious surface coverage.

### **Impervious Surfacing by Design Alternative for the 116th Interchange**

<b>SPUI</b>	<b>Clover Leaf</b>	<b>Expanded Diamond</b>
3.36 acres	3.93 acres	3.47 acres

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## **Recycling and Re-use of Construction Materials**

Construction materials will be recycled and re-used in accordance with an optional specification developed by [WSDOT](#). These specifications include several opportunities for incorporation of recycled and sustainable materials.<sup>8</sup> The specifications that will be applied to the 116th Interchange project include:

- **Section 2-01.2** encourages the contractor to sell useable timber, chips, firewood, etc.
- **Section 2-02.3(3)** allows broken pavement and concrete to be incorporated in embankments.
- **Section 5-04.2** allows that up to 20% recycled asphalt pavement (RAP) may be used in the manufacture of hot mix asphalt (HMA).
- **Section 5-04.3(14)** requires that debris from planing HMA become the property of the contractor. This material may be used as noted above, and is also a marketable product that they can use for other public and private work.
- **Sections 5-05** and **6-02** allow fly ash and ground granulated blast furnace slag to be added to concrete.
- **Sections 8-01** and **8-02** have numerous uses for compost.
- **Section 9-03.21** lists requirements for using various recycled materials (RAP, concrete rubble, glass aggregate, steel furnace slag) in place of virgin aggregates for the various types of aggregates used in highway construction.
- **Section 9-16.3(2)** allows for guardrail blocks made from recycled materials per [NCHRP Report 350](#).

## **Additional Sustainable Measures and/or Avoidance of Adverse Environmental Impacts**

- Environmental mitigation measures will minimize or offset adverse effects on essential fish habitat, as per the Magnuson-Stevens Act.
- Decreased intersection congestion and delay will reduce emissions and have beneficial impacts on air quality.
- The project does not contain suitable habitat for endangered, threatened, or species of concern, except for salmonids and the Bald Eagle. The project will improve salmonid habitat, including two new “fish-friendly” culverts and a restored stream channel. There are no recorded eagle nests, territories or concentrations within at least 1.5 miles of the site.

### **(v) Safety**

[WSDOT](#) has provided the latest 3-year collision history (January 2006—December 2008) for the ramps and mainline influence area of the 116th Interchange. The data show the ramps, and “influence area” for the ramps. Records show 107 collisions in that period, resulting in 61 injuries involving 204 vehicles. Approximately 50% of these collisions were rear-end accidents, systemic with the congestion and back-ups associated with the existing interchange area. The rear-end collision rate for Washington State is only 27%.

In addition, collisions at the 116th Interchange have *increased* an annual average of 13% in the last 3-year reporting period (2006—32 collisions, 2007—34 collisions, 2008—41 collisions). In the same time period, Washington State highways have experienced an annual average *decrease* of 3%. WSDOT is constructing center median barriers on I-5 due to the severity of some of these collisions, but these barriers will not change the collision frequency on the actual 116th Interchange ramps and bridge. A simple line extrapolation of collision history at the current 116th Interchange to 2012 (the proposed opening year of a new 116th Interchange) generates an estimate of 61 collisions a year. The new 116th Interchange would return congestion related rear-end collisions to pre-2000 levels, dropping approximately 50% (half of which would be avoided injury-related accidents).

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<sup>8</sup> The above references were taken from the following site:  
<http://www.wsdot.wa.gov/Environment/HazMat/wasterecycle.htm>

### Collision History and Projections with and without New 116th Interchange

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014
Existing Interchange Collisions	32	34	41	46	51	56	61	66	71
New Interchange Collisions							30	35	40

This projected 50% reduction in accidents with a new 116th Interchange equals a reduction of 30 accidents per year, of which 50% (15 per year) would be injury accidents. Based on a March 18, 2009 Secretary of Transportation memorandum, the estimated economic benefit of avoiding a traffic fatality is \$6.0 million, and avoidance of a serious injury accident is valued at \$345,000 (0.0575 x \$6M). Even if it is assumed that no projected injury accidents at the new 116th Interchange would result in fatalities, the new safety improvements would save \$5,175,000 annually in this respect. The corresponding present value of these savings over the period between 2012 and 2040 at 7% discount rate is \$62.8 million. This savings alone is more than the total cost of the 116th Interchange project at \$62.6 million.

The new 116th Interchange would also significantly improve current and future scenarios for ramp traffic backing up onto I-5. The existing 116th Interchange ramps provide over a 1,000 feet of storage, but vehicles frequently back-up during the PM peak-hour, especially into I-5 northbound lanes. Back-ups carry through adjacent signals on either side, and create severe bottlenecks, increasing driver frustration and collision potential on I-5 and on the local arterial system, and blocking driveways and increasing red light violations. The forecast peak queuing analysis with no interchange improvements exceeds the link distances of the ramps, and indicates queues would back into onto the adjacent arterial nearly 2,000 feet eastbound and over 1,000 feet westbound. Additional information is provided under the *Economic Competitiveness* and *Livability* sections of this application.

Such back-ups also impede freight movements on I-5. Over 46 million tons of freight moves daily through this section of I-5, and there is large truck stop service business at the 116th Interchange attracting higher levels of truck exits than those simply dictated by local deliveries. With the high percentage of trucks (8-10%) out of the total traffic using the 116th Interchange, the number of collisions are more frequent. Trucks cannot stop easily when off-ramp queues extend into the I-5 mainline, and truck collisions tend to be more severe and cause longer delays for incident control.

### (b) Job Creation and Economic Stimulus

Northern Snohomish County is currently suffering from the after-effects of a major housing start decline. Until late 2007, the housing industry provided jobs to thousands of construction workers in the area. Presently, most of these construction jobs have disappeared, leaving the county with a much higher jobless rate than other population centers in Washington. While still higher than the state and national averages, incomes in cities in Snohomish County tend to be lower than those found elsewhere in the Puget Sound Region. According to the Washington Employment Security Department, the June 2009 unemployment rate hit 10.1% in the county, its highest rate since the 1980s. Economic disparities tend to be even more acute on the Tulalip Reservation. The most recent data (2006) shows that even before the current economic downturn that the Reservation suffered from a 12% unemployment rate.

### Median Household Income Comparison

Nation & State		Project Vicinity			Puget Sound Region	
U.S.	Washington	Marysville	Everett	Bellevue	Sammamish	Redmond
\$41,994	\$45,776	\$47,088	\$40,100	\$62,338	\$101,592	\$66,735

Source: 2000 U.S. Census

### Promotion of Job Opportunities

This slow-down in housing construction and economic development is temporary' and this project is need to unlock and attract economic development and the associated jobs and housing needs. Detailed projections and descriptions of the direct, indirect, and induced job creation potential generated by a new 116th Interchange are provided under the *Economic Competitiveness* section of this application.

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## Opportunities for Minority-Owned, Small and Disadvantaged Businesses

During construction, the 116th Interchange will provide opportunities for small and disadvantaged business enterprises, including veteran-owned and service-disabled veteran-owned. As the primary project proponent, the Tulalip Tribes will work with the project contractors to encourage qualified, employable minorities to participate in the competitive bid and procurement processes. The 116th Interchange project will promote the creation of job opportunities for low-income workers through the use of best practice hiring programs and utilization of apprenticeship (including pre-apprenticeship) programs. As the project is located within the Tulalip Reservation, it is also subject to oversight from the [Tulalip Tribal Employment Rights Office](#) (TERO), a community-based organization organized to connect disadvantaged workers with economic opportunities. The TERO office requires businesses locating or working on the Reservation to:

- Hire TERO qualified and certified workers.
- Give Native-owned businesses the opportunity to bid on projects and services.
- Negotiate a compliance plan prior to commencing work.

## Compliance with Federal Laws

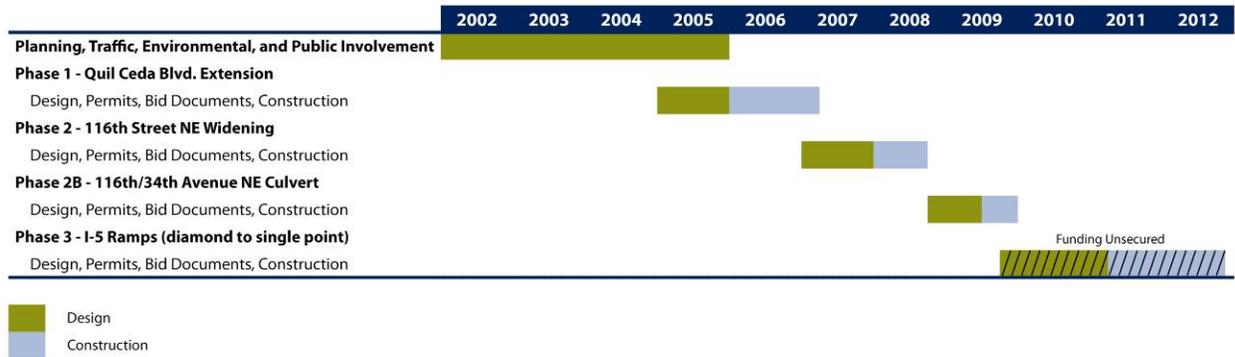
The Tulalip Tribes have a sound track record on labor practices and compliance with Federal laws requiring that workers are safe and treated fairly, and will comply with Federal prevailing wages laws, equal opportunity laws, Davis Bacon standards, “Buy American” clauses of the ARRA, and other standards applicable to federally-funded transportation improvement projects. Best practices, consistent with U.S. civil rights and equal opportunity laws, for ensuring that all individuals, regardless of race, gender, age, disability, and national origin, have access to project opportunities will be strictly followed. The DBE goal will be established with WSDOT for the 116th Interchange project, as it has been for previously completed projects, and is likely to be at least 10% of the overall construction contract.

## Project Schedule

The planning, preliminary design, alternatives analysis, and environmental documentation have been completed for all phases of the 116th Interchange project:

- A NEPA compliant EA and FONSI have been completed and issued for the entire project, and the preferred alternative has been selected (January 2006).
- A channelization plan and Access Point Decision Report have been approved (February 2006).
- The realignment of Quil Ceda Blvd and 34th Avenue NE is completed (May 2007).
- The widening of 116th Street NE west of the interchange and culvert installation are completed (August 2008).
- The Quilceda Creek channel restoration and culvert replacement under 34th Ave NE is underway (October 2009 completion).
- The final phase, reconstruction of the 116th Interchange, requires the additional funding requested from the TIGER Program. From the point of Notice of Grant Award (February 2010), it will take approximately 10 months to complete construction documents and 21 months to complete construction (October 2012).

## I-5/116th Street NE Interchange Improvements – Project Schedule



### Environmental Approvals

Because I-5 is a federal highway, the project must undergo review pursuant to [NEPA](#). For the purposes of NEPA review of the 116th Interchange project, the [FHWA](#) and the [BIA](#) were co-lead agencies. The necessary EA was completed in 2005. A [FONSI](#) was issued for the entire project in January 2006. The FONSI identified all necessary environmental improvements necessary to offset impacts associated with the project. These improvements, which are cataloged under the *Sustainability* section this application, are currently under construction and will be completed in October 2009, in full accordance with the assumptions and findings made in the EA.

### Legislative Approvals

The 116th Interchange project, approved by Tribal resolution, will occur on property owned by the Tulalip Reservation, and the responsible local governing body is the Tulalip Tribal Council. In addition, other entities have issued approvals for all project elements to date, such as for the NEPA FONSI, habitat restoration improvements, and approach road reconstruction. These actions and approvals are discussed throughout this application. Written endorsements and indications of support from a broad range of local and regional officials including the [City of Arlington](#), [City of Marysville](#), [Snohomish County](#), and [Puget Sound Regional Council](#) have been secured.

### State and Local Planning

The 116th Interchange project has been included in the Tulalip Tribes' [Long-Range Transportation Plan](#) since 2002, well before the initial development phases discussed elsewhere in this TIGER application were underway. The current (2008) version of this Transportation Plan addresses 116th Street NE Interchange deficiencies and opportunities frequently and at multiple levels. The 116th Street NE Interchange appears first on this Transportation Plan's list of priority capital improvement projects. Citations and discussion in the Tulalip Transportation Plan include interstate travel demand, safety, traffic volume capacity, improvements to approach roads, pedestrian and bicycle use, and economic impacts on Quil Ceda Village commercial development.

The Transportation Plan also enumerates a series of goals promoting multi-modal transportation options, sustaining community character, enhancing the environment, assuring adequate level of service and safety, and economic opportunity. As illustrated elsewhere in this TIGER application, the 116th Interchange project, as conceived and as it is being implemented, supports these Transportation Plan goals in several unique ways.

The City of Marysville's current [Comprehensive Plan](#) identifies the 116th Interchange as necessary to promote future growth in the northern part of the city. The City's Comprehensive Plan also addresses the need for improvements to the 116th Interchange, and in 2001 the City adopted a [116th Street NE Planning Area Master Plan](#) that further catalogs the importance of a fully functional interchange.

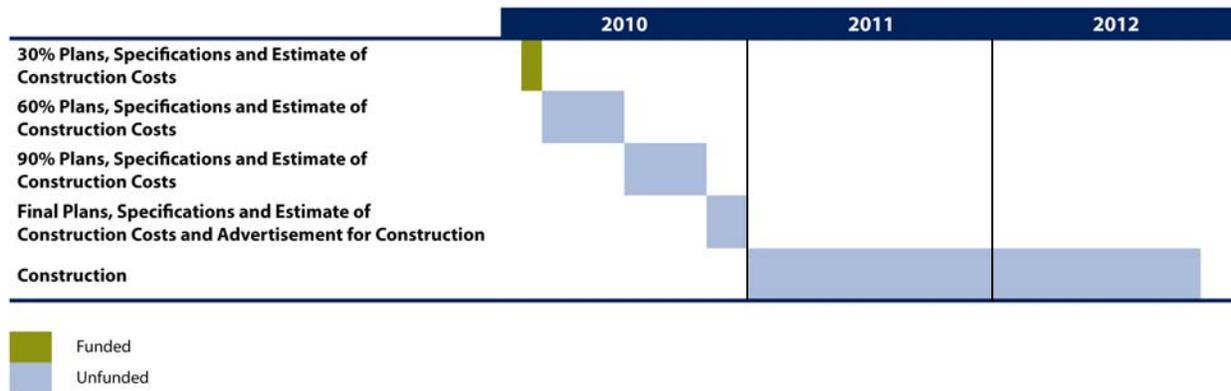
In addition, 116th Interchange elements and phases are listed in the Transportation Improvement Plans (TIPs) of:

- [Snohomish County 2009-2014](#)
- [Puget Sound Regional Council Vision 2040](#)
- [Washington State Department of Transportation 2009-2012](#)

## Technical Feasibility

The transportation planning, Access Point Decision Report, EA, Public Involvement process, Findings and Order of No Significant Impacts, and preliminary design for the 116th Interchange project were all completed by 2006. Two portions of the project have been completed, and a third phase is under construction. These early phases constructed the local road improvements and environmental mitigation for the whole project and will be completed in October 2009. Preliminary engineering for the SPUI has been completed by the Tulalip Tribes, reviewed and accepted by Snohomish County, WSDOT, and FHWA. The work included channelization plans for approval, preliminary bridge and structures designs, electrical designs, stormwater designs and construction staging, and temporary traffic control designs. The final design and preparation of construction bid documents for the interchange reconstruction are ongoing and will be completed according to the following schedule. *(Note: This assumes that funding is secured in February 2010 to complete design efforts and fund construction.)*

### Final Design and Preparation of Construction Bid Documents Schedule



Final design work under way includes the preliminary bridge plan, design documentation package, retaining wall designs, signal and illumination designs, noise wall designs, stormwater designs, and construction staging plans.

As noted in the *Innovation* section of this application, all innovative facets of the project have been previously field-tested for durability, safety, and performance.

## Financial Feasibility

As detailed elsewhere in this application, the 116th Interchange project is partly complete. Additional funding to reconstruct the main interchange structure is required. If a TIGER grant is awarded, there will be adequate funding available to complete the entire project.

The first cost estimate for this project was completed in 2002. At that time, the estimate was \$45 million (2002 dollars). Adjusted for inflation to 2009 at 5%, this initial estimate would be \$63.3 million. A recent (2009) cost estimate revision forecast a \$62.6 million cost for the full project. The total project costs have kept in line with the initial projections.

The Tulalip Tribes are pursuing this completion funding while continuing forward with the design and permitting with current funds. Final design and preparation of construction ready documents is underway with \$1.9 million dollars of previously secured funds. The remaining portion of preconstruction costs, \$1.95 million is unfunded as well as the \$41.15 million for construction. The requested funding from the TIGER Program is \$43.1 million and will complete the funding package for the project.

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## 2. Secondary Selection Criteria

### (a) Innovation and Innovative Strategies

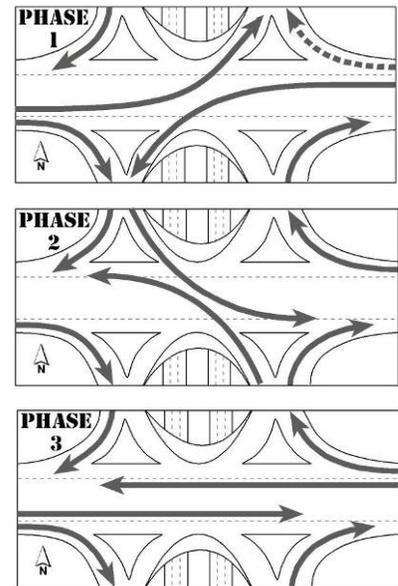
The Tulalip Tribes have actively sought opportunities to leverage innovative strategies and technologies in the 116th Interchange project. While all the following strategies have been tested at other locations in Washington State, the combined use of these technologies will provide benefits in a manner that exceeds the sum of the parts.

#### Single-Point Urban Interchange (SPUI)

SPUIs offer improved operation efficiency and safety as well as reduced right-of-way requirements compared to other interchange forms. Left turn traffic from both directions are able to advance simultaneously without crossing paths. Because traffic passing through the interchange can be controlled by a single signal, vehicles can clear the intersection much more quickly than in a diamond interchange (which requires two sets of traffic signals).

SPUIs also allow for wider turns, easing movement for large vehicles such as trucks and RVs. Furthermore, an SPUI takes up considerably less space than a full cloverleaf interchange, allowing construction to take place on a more limited amount of property. The stormwater benefits of reduced area of impervious surface allowed by the SPUI are noted under the *Sustainability* section of this application.

Finally, SPUIs are safer than other space-efficient interchange forms such as diamond interchanges. Research suggests that injury and fatality rates associated with collisions that do occur are notably lower for SPUIs than diamond interchanges



*Proposed design of SPUI.*

#### [Intelligent Transportation Systems \(ITS\)](#)

As part of this project, ITS components will be installed within the interchange area. At typical spacing, data collectors will be installed every half mile to provide the most accurate data necessary to make accurate estimates of travel times between locations. Additional ITS components will include ramp metering and high-occupancy vehicle (HOV) bypass lanes. These components are part of regional active traffic management strategy that is designed to encourage the use of HOVs and public transit options.

#### Variable Message Signs (VMS)

VMS will be employed for southbound traffic between I-5's 88th Street Interchange to the south of the 116th Interchange and SR 528 to the north. Signs will provide accurate travel time estimates to allow motorists to make educated decisions about travel priorities, routes, and congestion.

#### Signal Interconnect

Signals at the 116th Interchange ramps will be interconnected and tied back in to WSDOT's centralized computer system. Additionally, signals at Quil Ceda Blvd. and State Street will be interconnected and coordinated to improve efficiency.

#### Solar Power Appurtenances

Solar-powered fuel cells will be employed on emergency call boxes and lit and variable message signage.

### (b) Partnership and Collaboration

The Tulalip Tribes, BIA, and FHWA have cooperated closely in moving the 116th Interchange project forward. BIA and FHWA acted as co-leads on the project for NEPA. FHWA was and is the approving authority for the interchange improvements. FHWA has provide funding for earlier phases of the project through the Public Lands Highway Discretionary program and High Priority Projects program. BIA has approved and distributed Tulalip Tribes Transportation dollars through the Indian Reservation Roads program to the interchange project.

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As mentioned previously, the following entities are also key stakeholders:

- WSDOT—WSDOT is the review and approval authority on the final design, construction document preparation, and construction of the improvements affecting the interstate and interchange right of way within the reservation. WSDOT has contributed \$900,000 to the project.
- Snohomish County—The project will benefit the residents of, Snohomish County. The County is committed to the success of the 116th Interchange project and has contributed \$525,000 to project-associated culvert replacements. The County has also served as the review and approval authority for designs, construction document preparation and construction of the improvements affecting their public road right-of-way within the Tulalip Reservation.
- City of Marysville—The City has identified the 116th Interchange project as the City's top priority project on the I-5 corridor. The City has also designed and constructed roadway, bicycle, and pedestrian improvements east of the interchange to reduce congestion and integrate with the project.

## **FEDERAL WAGE RATE REQUIREMENT**

The Tulalip Tribes, in leading the planning, design, and construction of improvements on public roadways, including prior phases of this project, have always applied federal wage rate requirements in their contracts in compliance with FHWA requirements. Further, the Tulalip Tribes have reviewed the requirements of Subchapter IV of Chapter 31 of Title 40, United States Code and certify that they will comply with these requirements.

## **NEPA REQUIREMENT**

As stated previously, the necessary EA was completed in 2005. A FONSI was issued for the entire project in January 2006. The FONSI identified all necessary environmental improvements necessary to offset impacts associated with the project. These improvements, which are cataloged under the *Sustainability* section this application, are currently under construction and will be completed in October 2009, in full accordance with the assumptions and findings made in the EA.

## **ENVIRONMENTALLY RELATED FEDERAL, STATE, AND LOCAL ACTIONS**

Upon completion of the EA, FONSI, and NEPA process, the following permits and approvals have been obtained.

- U.S. Army Corps of Engineers (USACE) Section 404 Permit 5/5/09
- Section 106 Compliance letter from the USACE dated 6/9/09
- National Marine Fisheries and USFWS concurrence letters on 9/29/05 and 8/23/05, respectively
- National Marine Fisheries concurrence letter on Biological Assessment Supplement (list of Steelhead) on 12/18/07
- USACE Nationwide permit 14 issued on 5/5/09
- Washington State Department of Ecology (Ecology) 401 Water Quality Certification determination does not apply letter on 5/7/09
- Washington State Department of Fish and Wildlife Hydraulic Project Approval dated 4/22/09
- Snohomish County grading and Right of Way Use permits have been issued 6/15/09
- Tulalip Tribes grading, Critical Areas Review and 401 Certification have been issued 6/15/09
- Ecology National Pollution Discharge Elimination System (NPDES) General Permit issued 1/29/08, expires 12/16/10
- U.S. Environmental Protection Agency Construction General Permit issued 6/30/0, expires 6/30/10

Only the following permits and approvals are left to be obtained for the construction of the final phase of the project, including:

- WSDOT Right of Way Use Permit
- Tulalip Tribes Grading, Critical Areas Review, and 401 Certification

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## CONCLUSION

In summary, the 116th Interchange Project will provide several benefits to the community:

- Improve safety and level of service
- Increase capacity
- Decrease congestion and pollution
- Improve transportation options, including full pedestrian/bike access
- Provide stream restoration and fish habitat enhancement
- Enhance the livability for the local community
- Generate 1,100 construction jobs and 7,000 new permanent jobs in Snohomish County in an economically depressed region
- Generate \$29 of direct benefits for every dollar invested

Further, most of the necessary permits are in place and written endorsements received by local and regional officials, including the City of Arlington, City of Marysville, Snohomish County, and the Puget Sound Regional Council. The project is underway and is entering the third and final phase with partial funding from other sources. The requested ARRA funding of \$43.1 million will complete this final phase. The Tulalip Tribes appreciate the opportunity to bring this vital project forward to successful completion.

