Washington State

Amtrak *Cascades* Capital Cost Estimates 2004 Technical Report

VOLUME 2

Washington State Department of Transportation

February 2006

Prepared by the Freight Systems Division
Washington State Department of Transportation

February 2006

For more information, contact:

- Call the WSDOT Rail Office at (360) 705-7900 or 1-800-822-2015;
- Write to the WSDOT State Rail Office at P.O. Box 47407
  Olympia, WA 98504-7407;
- Fax your comments to (360) 705-6821; or
- E-mail your comments to rail@wsdot.wa.gov

Persons with disabilities may request this information be prepared and supplied in alternate forms by calling the WSDOT ADA Accommodation Hotline collect 206-389-2839. Persons with vision or hearing impairments may access the WA State Telecommunications Relay Service at TT 1-800-833-6388, Tele-Braille 1-800-833-6385, or Voice 1-800-833-6384, and ask to be connected to 360-705-7097.

Amtrak *Cascades*
Capital Cost Estimates 2004
Technical Report

VOLUME 2

Prepared for the

Washington State
Department of Transportation

By

HDR Engineering, Inc.

in association with

Transit Safety Management, Inc.
The Resource Group Consultants, Inc.

February 2006

Washington State
Department of Transportation

Table of Contents

List of Exhibits

Chapter One: Introduction

This technical white paper presents the capital cost estimates for each of the proposed infrastructure improvements associated with increased service of the Amtrak *Cascades* program over the next twenty years. Detailed information about each of these projects can be found in the *Amtrak Cascades Technical Report: Operating and Capital Plan, June 2003*.

How were capital costs developed?

The following steps were taken in creating the cost estimates for each project identified in the Amtrak *Cascades* Operating and Infrastructure Plan:

1. In order to identify costs associated with each project in the estimate each project site was visited and a rail inspection car ride was taken of the entire corridor. Existing rail studies/maps/previous estimates and other existing information regarding the project sites were gathered and incorporated into the cost estimate. Existing track charts were used to estimate existing structures, road crossings, drainage culverts and other existing conditions.

2. Estimated quantities were derived from project information provided in the twenty year plan and information gathered regarding existing conditions.

3. The unit cost data was developed based on engineering judgment and historical cost data from railroads and passenger rail operators. The first task in developing the cost data was to develop a list of work items that are typical in the scope of work of the proposed projects. The costs of these work items were then reviewed using various cost references and historical cost data. All costs include contractors' direct cost for the work, general expenses, overhead and profit.

4. The costs also include items such as engineering, construction management, tax, environmental mitigation costs and allowances for contingencies that were included as percentage add-ons. The engineering and construction management add-ons include the cost of preliminary engineering, final design, construction management and inspection services, and administration services. The environmental mitigation add-on covers environmental studies and actions taken to minimize the environmental impact of the projects. A design contingency was included to account for unseen items or quantity fluctuations and variances in unit costs. The design contingency of thirty percent reflects the planning level

of engineering data that was available and the preliminary design completion.

5. A final independent review and quality control check was performed on each estimate and the unit cost data.

6. Unit costs included in this report are in year 2003 dollars.

Exhibit 1-1 at the end of this chapter shows the base unit costs that were used.

What assumptions were made?

The development of these capital cost estimates were based on a number of assumptions:

- Embankment and excavation was based on a minimum depth of four foot fill sections or four foot cut sections, with a crest of thirty feet and a two to one slope.

- Major drainage structures include: concrete arch, box, and pipes greater than eight feet in height or diameter.

- Turnout and crossover type, number and quantities are assumed and subject to Burlington Northern and Santa Fe Railway Company's review and approval.

- Railroad signal (Centralized Traffic Control (CTC) control point) to be installed at every turnout and crossover.

- Grade separation bridge deck widths are equal to thirty-six feet for two-lane roadways and 120-foot span for two tracks.

- Right-of-way cost estimates include land acquisition and house/building demolition. Right-of-way estimates were only used for projects where sufficient planning has been performed to allow for an order-of-magnitude estimate of such costs.

- Depending upon jurisdiction, sales tax varies. For consistency, a sales tax of 8.2 percent was used for all projects (including those in British Columbia). Sales tax was not applied to those items which are based on a percentage of total costs (environmental mitigation, engineering/ administration, and construction management).

- All costs are in 2003 U.S. dollars.

Are there any risks associated with these cost estimates?

The estimates in this document are conceptual. Cost estimates can be conceptual, preliminary, or final (or someplace in between each of these steps, depending upon the level of project design). For conceptual cost estimates, known information is compiled, and then industry-wide, standard, "unit costs" are used to estimate how much a particular element would cost. For example, in order to estimate the cost of rail for a 10,000 foot siding, that length would be multiplied by the current, industry standard cost for the particular rail that would be used. However, if through further project design, it is discovered that an environmentally critical area is located along the route, the route may have to be shifted, may have to bypass the critical area, or it may have to mitigate for that impact. These additional, refined costs are not considered in the conceptual cost estimate. Furthermore, soil conditions and underground utilities are often unclear or only generally defined during conceptual design and may significantly affect final design costs. During the conceptual design phase, these potential costs are generally included in the "contingency" costs described below.

Other cost estimates included in this type of conceptual cost include the amount of track construction and existing track rehabilitation, the amount of signalization, the number and type of grade crossings and the number of bridges and culverts by type and length. This information is accurate and generally does not change throughout the design process. However, as mentioned above, the specific circumstances for the construction of each item are unknown.

The specifics of any installation or construction are not available during the conceptual stage of engineering. The unknown site-specific information will cause the cost of the individual items to vary. Some may cost less at completion and some more. Experience indicates that for the level of detail of the available information, a contingency[1] of thirty percent is sufficient for the cost-increasing details to be found during engineering in the corridor and the cost of environmental mitigation will generally be twenty percent of the construction total.

The estimates can also be affected by time. There can be significant unpredictable factors in addition to the normally predictable effect of

[1] *Contingency is an amount intended to mitigate the unknown. As the level of detail in project plans increases, the contingency in the estimate is reduced because there is less that is unknown. The contingency in the final engineered estimate is small because the estimate includes all information that it is possible to know without beginning construction. There are almost always surprises, but their effect is generally small enough to fall within the contingency amount. Occasionally, a surprise such as the discovery of historical artifacts or underground water can have an impact that exceeds the amount estimated for contingency.*

inflation. In recent years, the costs of building materials, notably steel and concrete, and fuel have been volatile. As development spreads, property values for vacant land may increase considerably or land that was vacant at the time of the estimate may have been developed.

Exhibit 1-1
Unit Costs Sheet (year 2003 dollars)

		UNITS	UNIT COST
I. EARTHWORK			
	1. Embankment	CY	$20
	2. Excavation	CY	$10
	3. Rock Excavation	CY	$50
II. TRACK			
	1. Track Construction		
	a. New Track	TF	$135
	b. Rehab Track	TF	$60
	2. Turnouts		
	a. #9's	Each	$100,000
	b. #11's	Each	$110,000
	c. #15's	Each	$135,000
	d. #20's	Each	$160,000
	d. #24's	Each	$170,000
	e. #33's	Each	$360,000
	f. #48's	Each	$500,000
	3. Crossovers		
	a. #9's	Each	$200,000
	b. #11's	Each	$220,000
	c. #15's	Each	$270,000
	d. #20's	Each	$320,000
	e. #24's	Each	$340,000
	f. #33's	Each	$720,000
	4. Bridges (Each track of a multi-track bridge counted separately)	TF	varies
	5. Culvert Crossings		
	a. Major Culverts (>36" Diameter)	LF	$600
	b. Minor Culverts (<36" Diameter)	LF	$100
	6. Other Drainage	LS	Varies
	7. Retaining Walls	SF	$45
III. ROADWAY			
	1. Roadway Construction	SY	$60
	2. At-Grade Crossing		
	1. Track Crossing	TF	$500
	2. Crossing Approaches	SY	$75
	3. Grade-Separation Crossing		
	a. Bridge	SF	$100
	b. Roadway (earthwork & paving)	SY	$50
	c. Misc. (non-typical per project)	LS	$1
	4. Crossing Signals		
	a. Upgrade Signal - Barrier Gates	Each	$200,000
	b. New Signal	Each	$250,000

Legend: **CY = cubic yards** **TF = track feet** **LF = linear foot**
SF = square feet **SY = square yards** **LS = lump sum**

Exhibit 1-1 (Continued)
Unit Costs Sheet

		UNITS	UNIT COST
IV. RAILROAD SIGNALS			
	a. Per Power Turnout *	Each	$250,000
	b. Per Mile	Mile	$750,000
V. UTILITY RELOCATION/ADJUSTMENT			
	1. Transmission Lines	LS	Varies
	2. Fiber Optic Lines	LF	$95
	3. Miscellaneous	LS	Varies
VI. CONTINGENCIES (30%)			
		LS	
VII. ENVIRONMENTAL MITIGATION (20%)			
		LS	
VIII. ENGINEERING/ADMINISTRATION (7%)			
IX. CONSTRUCTION MANAGEMENT (6%)			
		LS	
X. RIGHT-OF-WAY			
		ACRE	$250,000
XI. TAX (8.2%)			

Legend: **CY = cubic yards** **TF = track feet** **LF = linear foot**
SF = square feet **SY = square yards** **LS = lump sum**

* Note: #33 and #48 turnouts priced at 1.5 units each to reflect higher cost of additional switch machines

Chapter Two: Summary of Capital Costs

Using the methodology discussed in Chapter One, capital costs for each infrastructure project were developed. These costs were estimated using current year dollars (2003). **Appendix A** presents detailed cost sheets for each of these projects. Total project costs have been estimated to be approximately $4.6 to $5.1 billion depending upon the location of the Vancouver, BC terminus.

Exhibits 2-1 and **2-2** present a summary of capital costs for each project. Based upon the proposed implementation phasing (timetable) of each project, **Exhibits 2-3** through **2-8** indicate the general location of each project. These exhibits also reference the page number for each proposed improvement's detailed conceptual cost estimate.

Appendix B lists the frequent abbreviations used in these cost sheets. In addition, for the purposes of long term decision-making, costs were also inflation-adjusted to reflect potential costs when the project was actually built. **Appendix C** presents these inflation-adjusted costs.

Exhibit 2-1
Summary of Capital Costs: Seattle to Vancouver, BC

PROJECT NAME	CONSTRUCTION COST (in millions) (2003 dollars)
TIMETABLE A	
Mount Vernon Siding	$8.0
TIMETABLE B	
Swift Customs Facility	$12.0
Stanwood Siding	$9.8
PA Junction/Delta Junction Improvements	$30.4
Bellingham GP Improvements	$2.0
Colebrook Siding	$11.3
TIMETABLE C, D and E	
Sound Transit	$180.0
Bow to Samish Siding Extension	$15.4
Bellingham Siding Extension	$28.3
Ballard Bridge Speed Increase	$10.0
Scott Road Station	$75.0
Still Creek to CN Junction	$12.9
Vancouver Terminal Control System	$6.7
Sperling to Willingdon Junction	$10.4
Brunette to Piper Siding	$25.5
Willingdon Junction	$14.7
CN Junction	$3.6
Frasier River Bridge	$500.0
TIMETABLE F	
Marysville to Mount Vernon High Speed Track	$277.2
Burlington to Bellingham High Speed Track	$217.9
Bellingham to Blaine High Speed Track	$123.8
Everett Junction to Everett Second Main Track	$9.9
Advanced Signal System (Seattle to Blaine)	$138.0
Advanced Signal System (Blaine to Brownsville)	$60.0
White Rock Bypass	$307.4
Colebrook to Brownsville High Speed Tracks	$79.9

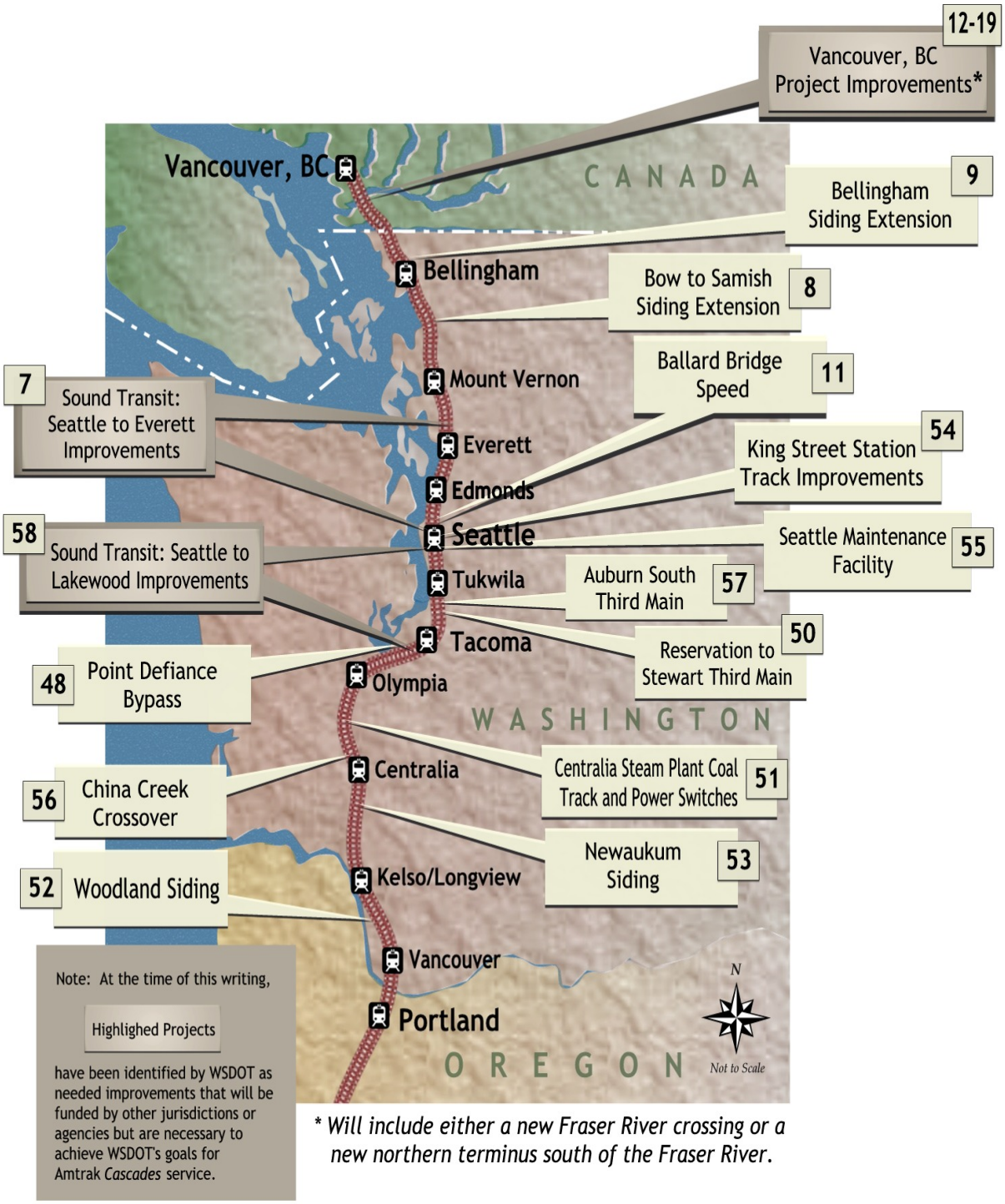
Exhibit 2-2
Summary of Capital Costs: Seattle to Portland, OR

PROJECT NAME	CONSTRUCTION COST (in millions) (2003 dollars)
TIMETABLE A	
Felida Crossover	$2.2
Woodland Crossover	$2.8
Titlow Crossover	$4.0
Ruston Crossover	$3.5
Sound Transit Phase 1 and 2	$264.0
TIMETABLE B	
Vancouver Rail Project	$76.8
Kelso to Martin's Bluff Rail Project	$394.9
Leary Crossover (Centennial Crossover)	$1.7
Pattison Crossover (Centennial Crossover)	$1.7
Winlock Crossover	$3.4
Ketron Crossover	$3.4
Tenino Crossover	$3.4
North Portland Junction to Kenton	$51.0
TIMETABLE C	
Point Defiance Bypass	$310.6
Reservation to Stewart Third Main	$66.6
Centralia Steam Plant Coal Track and Power Switches	$16.6
Woodland Siding	$16.3
Newuakum Siding	$3.4
King Street Station Track Improvements	$80.0
Seattle Maintenance Facility	$95.0
China Creek Crossover	$1.7
Sound Transit Phase 3	$139.0
Auburn South Third Main	$41.8
TIMETABLE D	
Winlock to Chehalis Third Main Track	$95.1
Chehalis Siding	$8.9
Chehalis Junction Crossover	$3.4
East St. Johns Siding and Main Track Relocation	$51.1
Lake Yard North Leads	$18.4
Portland Union Station	$6.1
Advanced Signal System	$268.0
TIMETABLE E	
Chehalis to Hannaford Third Main Track	$67.0
Ostrander to Winlock Third and Fourth Main Track	$191.6
TIMETABLE F	
Felida to MP 114 Third Main Track	$104.1
Hannaford to Nisqually Third Main Track	$354.4
Columbia River Bridge (joint Washington/Oregon project)	$500.0

Exhibit 2-3
Timetable A: Location of Project Improvements

Exhibit 2-4
Timetable B: Location of Project Improvements

Exhibit 2-5
Timetable C: Location of Project Improvements

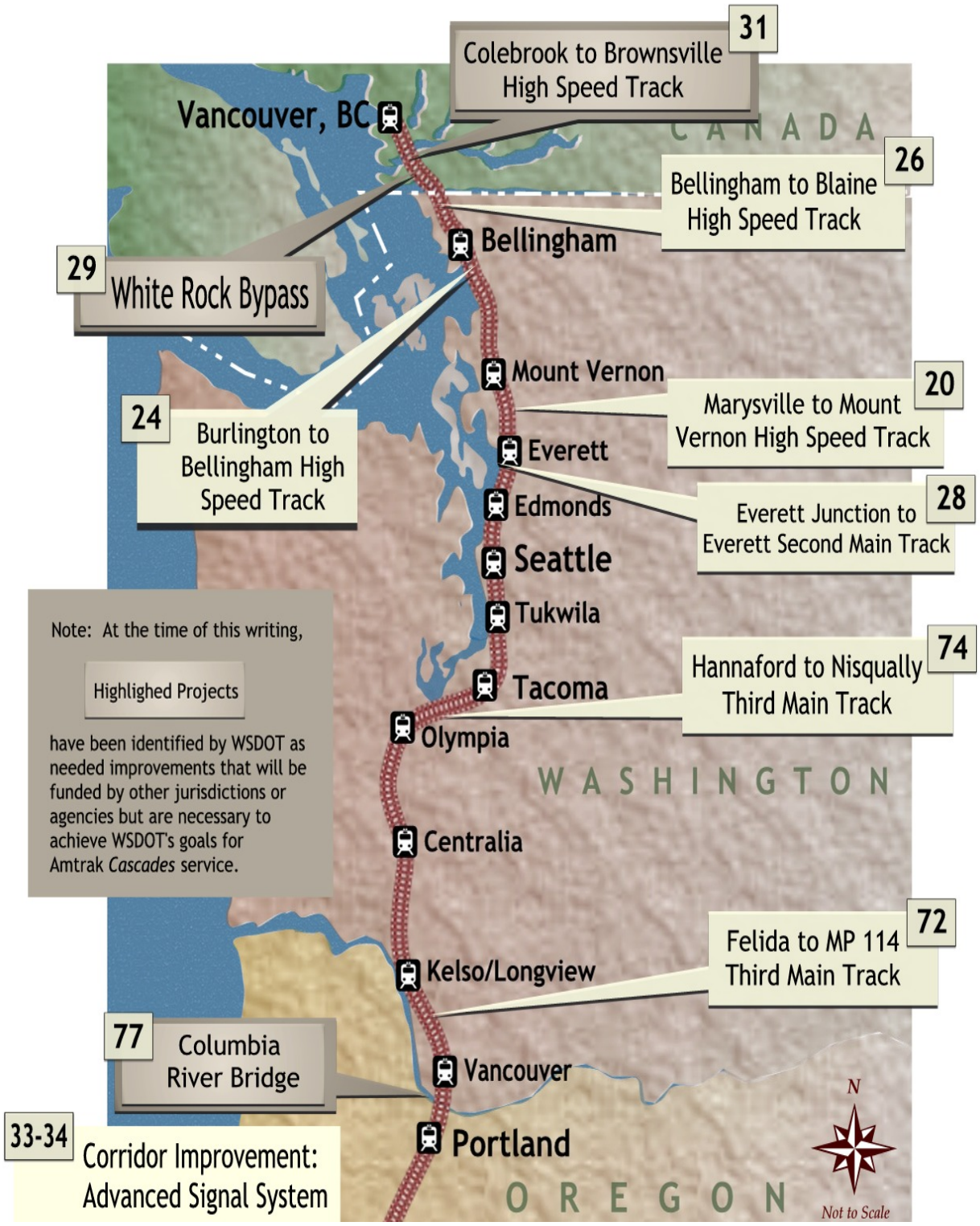


** Will include either a new Fraser River crossing or a new northern terminus south of the Fraser River.*

Exhibit 2-6
Timetable D: Location of Project Improvements

Exhibit 2-7
Timetable E: Location of Project Improvements

Exhibit 2-8
Timetable F: Location of Project Improvements



This page intentionally left blank.

Appendices

Appendix A: Detailed Capital Costs (2003 dollars)

Mt. Vernon Siding

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	43190	$647,850
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	6170	$832,950
b. Rehab Track	TF	$60	10560	$633,600
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	4	$440,000
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
4. Bridges				
a.	TF	$8,000	0	$0
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	120	$12,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 67.12 Public Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	120	$60,000
2. Crossing Approaches	SY	$75	700	$52,500
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	1	$200,000
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	0	$0
b. Per Mile	Mile	$750,000	2	$1,500,000
V. UTILITY RELOCATION/ADJUSTMENT				
1. Transmission Lines	LS	$1	0	$0
2. Fiber Optic Lines	LF	$95	0	$0
3. Miscellaneous	LS	$1,000,000	0	$0
VI. CONTINGENCIES (30%)	LS		0	$1,313,670
			CONSTRUCTION TOTAL	$5,692,570
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0	$1,138,514
			CONSTRUCTION & MITIGATION SUBTOTAL	$6,831,084
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0	$398,480
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0	$341,554
X. RIGHT OF WAY	ACRE	$ 250,000	0	$0
XI. TAX (8.2%)			0	$466,791
			TOTAL	$8,037,909

Assumptions:

Rehab Exist Siding from MP 65.5 to 67.5
Construct New storage track
with 6,170' if capacity.

Track Miles

2

2

$ 4,018,954 / mile

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Swift Customs Facility

	UNITS	UNIT COST	QUANTITY	TOTAL
The configuration of this facility is currently known only in general terms. The final configuration must meet the requirements of US and Canada customs.	LS	$12,000,000	1	$12,000,000

Exchange the alignments of the current main track and siding
Extend the existing siding to allow all customs-related switching to occur clear of the ina track
Construct a second siding
Construct additional tracks and other facilities to satisfy the requirements of US and Canada customs.

Stanwood Siding

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	51744	$776,160
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	7392	$997,920
b. Rehab Track	TF	$60	7128	$427,680
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	1	$160,000
e. #24's	Each	$170,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
4. Bridges				
a.	TF	$8,000	0	$0
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	330	$33,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
o. MP 56.92 Logan Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	120	$60,000
2. Crossing Approaches	SY	$75	700	$52,500
p. MP 57.42 Detting Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	120	$60,000
2. Crossing Approaches	SY	$75	700	$52,500
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	2	$400,000
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	1	$250,000
b. Per Mile	Mile	$750,000	2.75	$2,062,500
V. UTILITY RELOCATION/ADJUSTMENT				
1. Transmission Lines	LS	$1	0	$0
2. Fiber Optic Lines	LF	$95	0	$0
3. Miscellaneous	LS	$1,000,000	0	$0
VI. CONTINGENCIES (30%)	LS		0	$ 1,599,678
			CONSTRUCTION TOTAL	$6,931,938
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0	$ 1,386,388
		CONSTRUCTION & MITIGATION SUBTOTAL		$8,318,326
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0	$ 485,236
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0	$ 415,916
X. RIGHT OF WAY	ACRE	$ 250,000	0	$ -
XI. TAX (8.2%)			0	$ 568,419
			TOTAL	$ 9,787,896

Assumptions:	***Track Miles***	
Rehab Exist Siding from MP 55.18 to 56.53	*1.35*	*$ 3,559,235 / mile*
Extend Siding from MP 56.53 to MP 57.93	*1.4*	
	2.75	

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

PA Junction/Delta Junction Improvements

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	5200	$104,000
2. Excavation	CY	$10	5200	$52,000
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	53134.4	$797,016
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	24552	$3,314,520
b. Rehab Track	TF	$60	8818	$529,080
2. Turnouts				
aa.Remove Turnout	EA	$10,000	8	$80,000
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	10	$1,100,000
c. #15's	Each	$135,000	2	$270,000
d. #20's	Each	$160,000	1	$160,000
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	1	$220,000
c. #15's	Each	$270,000	1	$270,000
d. #20's	Each	$320,000	0	$0
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. MP 10.65 Remove Existing Bridge	LS	$2,000,000	1	$2,000,000
5. Culvert Crossings				
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 7.89 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
b. MP 8.06 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
b. MP 8.16 Public Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	150	$11,250
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	1	$200,000
b. New Signal	Each	$250,000	2	$500,000
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	8	$2,000,000
b. Per Mile	Mile	$750,000	5.74	$4,305,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		0	$4,799,735
			CONSTRUCTION TOTAL	$20,798,851
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0	$4,159,770
			CONSTRUCTION & MITIGATION SUBTOTAL	$24,958,621
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0	$1,455,920
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0	$1,247,931
X. RIGHT OF WAY	ACRE	$250,000	4	$1,000,000
XI. TAX (8.2%)			0	$1,705,506
			TOTAL	$30,367,977

Assumptions:	***Track Miles***	
New track from MP 10.9 To 10.46	*0.44*	*$ 4,295,329 / mile*
Rehab Track from MP 10.46 To 9.76	*0.7*	
2 New tracks from MP 9.76 To MP 90	*1.52*	
Rehab track from MP 9.0 To MP 8.03	*0.97*	
New Track from MP 8.03 To MP 7.80	*0.23*	
New yard track 13000 feet	*2.46*	
Realign Curve C0A-C, MP 0.5 TO MP 0.75	*0.25*	
Realign Curve 80-A, MP 8.0 TO MP 8.20	*0.2*	
Realign Curve 1783	*0.3*	
	7.07	

CTC PA Jct. - Delta Jct.

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Bellingham GP Curve

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	0	$0
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	1350	$182,250
b. Rehab Track	TF	$60	1600	$96,000
2. Turnouts				
aa. Remove Turnouts	Each	$10,000	3	$30,000
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	1	$110,000
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
4. Bridges				
a.	TF	$8,000	0	$0
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	0	$0
6. Other Drainage	LS	$0	0	$0
7. Demolition	LS	$650,000	1	$650,000
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	0	$0
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	0	$0
b. Per Mile	Mile	$750,000	0	$0
V. UTILITY RELOCATION/ADJUSTMENT				
1. Transmission Lines	LS	$1	0	$0
2. Fiber Optic Lines	LF	$95	0	$0
3. Miscellaneous	LS	$20,000	1	$20,000
VI. CONTINGENCIES (30%)	LS		0	$326,475
			CONSTRUCTION TOTAL	$1,414,725
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0	$ 282,945
		CONSTRUCTION & MITIGATION SUBTOTAL		$1,697,670
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0	$99,031
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0	$84,884
X. RIGHT OF WAY	ACRE	$ 250,000	0	$0
XI. TAX (8.2%)			0	$116,007
			TOTAL	$ 1,997,592

Assumptions:

Realign Curve and Rehab Siding

Remove 3 Existing Turnouts

Track Miles

#REF! / mile

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Colebrook Siding

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	70700	$1,060,500
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	10100	$1,363,500
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	2	$320,000
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
f. #33's	Each	$720,000	0	$0
4. Bridges				
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	60	$36,000
b. Minor Culverts (<36" Diameter)	LF	$100	90	$9,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
3. Grade-Separation Crossing				
a. Bridge	SF	$100	0	$0
b. Roadway (earthwork & paving)	SY	$50	0	$0
c. New 2 Lane Roadway and Grade Seperatior	LS	$8,000,000	0	$0
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	0	$0
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	2	$500,000
b. Per Mile	Mile	$750,000	3.8	$2,850,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		0	$1,841,700
			CONSTRUCTION TOTAL	$7,980,700
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0	$1,596,140
		CONSTRUCTION & MITIGATION SUBTOTAL		$9,576,840
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0	$558,649
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0	$478,842
X. RIGHT OF WAY	ACRE	$ 250,000	0	$0
XI. TAX (8.2%)			0	$654,417
			TOTAL	$11,268,748

Assumptions: ***Track Miles***

$ 5,930,920 / mile

New Siding Track	*1.9*
	1.9

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Sound Transit (Seattle - Everett)

	UNITS	UNIT COST	QUANTITY	TOTAL
Estimate and description furnished by BNSF includes the following components: *CTC between Seattle and MP 8* *Second Main Track between Galer Street and MP 5.4* *Second Main Track between MP 7 and MP 8* *Second Main track between MP 16 and MP 18* *Second Main Track between MP 27 and MP 28* *Lowell Siding extension west from PA Jct to East Portal of Everett Tunnel.* *Commuter train platform track at Everett passenger station and commuter equipment layover tracks*	LS	$180,000,000	1	$180,000,000

Bow to Samish Siding Extension

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	69484.8	$1,042,272
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	9926.4	$1,340,064
b. Rehab Track	TF	$60	4065.6	$243,936
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	2	$320,000
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	1	$320,000
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. MP 82.14 168' CTG Bridge	TF	$8,000	168	$1,344,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	150	$15,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
j. MP 81.21 S. Blanchard Rd. Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
k. MP 81.41 S. Legg Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
l. MP 81.31 N. Legg Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
3. Grade-Separation Crossing				
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	3	$600,000
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	4	$1,000,000
b. Per Mile	Mile	$750,000	2.65	$1,987,500
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		0	$2,514,457
			CONSTRUCTION TOTAL	$10,895,979
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0	$2,179,196
	CONSTRUCTION & MITIGATION SUBTOTAL			$13,075,174
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0	$762,719
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0	$653,759
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			0	$893,470
			TOTAL	$15,385,122

Assumptions:	***Track Miles***	
Rehab Exist Siding from MP 83.53 to 82.76	*0.77*	*$ 5,805,706 / mile*
Extend Siding from MP 82.76 to MP 80.88	*1.88*	
	2.65	

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Bellingham Siding Extension

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	101270.4	$1,519,056
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	14467.2	$1,953,072
b. Rehab Track	TF	$60	10190.4	$611,424
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	1	$110,000
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	2	$320,000
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	1	$220,000
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. MP 93.57 190' Wood Pile Trestle Bridge	TF	$8,000	190	$1,520,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	180	$18,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 93.60 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
b. MP 94.24 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	0	$0
2. Crossing Approaches	SY	$75	0	$0
c. MP 96.24 Pine Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	0	$0
2. Crossing Approaches	SY	$75	0	$0
d. MP 96.33 Public Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	0	$0
2. Crossing Approaches	SY	$75	0	$0
e. MP 96.65 Public Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	120	$60,000
2. Crossing Approaches	SY	$75	350	$26,250
3. Grade-Separation Crossing				
a. Bridge	SF	$100	18000	$1,800,000
b. Roadway (earthwork & paving)	SY	$50	666.667	$33,333
c. Misc. (non-typical per project)	LS	$1	0	$0
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	1	$200,000
b. New Signal	Each	$250,000	1	$250,000
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	2	$500,000
b. Per Mile	Mile	$750,000	7.8	$5,850,000
V. UTILITY RELOCATION/ADJUSTMENT				
1. Transmission Lines	LS	$1	0	$0

	2. Fiber Optic Lines	LF	$95	0	$0
	3. Miscellaneous	LS	$1,000,000	0	$0
VI.	CONTINGENCIES (30%)	LS		0	$4,505,778
				CONSTRUCTION TOTAL	$19,525,038
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		0	$3,905,008
				CONSTRUCTION & MITIGATION SUBTOTAL	$23,430,046
VIII.	ENGINEERING/ADMINISTRATION (7%)	LS		0	$1,366,753
IX.	CONSTRUCTION MANAGEMENT (6%)	LS		0	$1,171,502
X.	RIGHT OF WAY	ACRE	$250,000	3	$750,000
XI.	TAX (8.2%)			0	$1,601,053
				TOTAL	$28,319,354

Assumptions:	***Track Miles***	
Rehab Exist Siding from MP 92.20 to 93.56	*1.36*	*$ 6,064,102 / mile*
New Siding from MP 93.56 to MP 96.70	*2.14*	
New Mainline from MP 96.10 to MP 96.70	*0.6*	
Rehab Existing Siding from MP 94.81to 96.20	*0.39*	
Rehab Siding from MP 96.70 to MP 96.88	*0.18*	
	4.67	

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Ballard Bridge Speed Increase

	UNITS	UNIT COST	QUANTITY	TOTAL
Modify existing bridge for increased speed	LS	$10,000,000	1	$10,000,000

The nature of the bridge improvements required for the speed increase must be determined by an engineering assessment. In addition to new mitre rails and locks, structural changes may be required including changes related to curved track on the bridge. The lump sum is an estimate based on improvements of similar magnitude to other bridges.

Willington Junction

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	0	$0
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	0	$0
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
f. #33's	Each	$720,000	0	$0
4. Bridges				
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	0	$0
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
3. Grade-Separation Crossing				
a. Bridge	SF	$100	0	$0
b. Roadway (earthwork & paving)	SY	$50	0	$0
c. Douglas Road Grade Seperation	LS	$8,000,000	1	$8,000,000
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	0	$0
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	0	$0
b. Per Mile	Mile	$750,000	0	$0
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		0	$2,400,000
			CONSTRUCTION TOTAL	$10,400,000
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0	$2,080,000
			CONSTRUCTION & MITIGATION SUBTOTAL	$12,480,000
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0	$728,000
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0	$624,000
X. RIGHT OF WAY	ACRE	$ 250,000	0	$0
XI. TAX (8.2%)			0	$852,800
			TOTAL	$14,684,800

Assumptions: ***Track Miles***

/ mile

Close Douglas Rd Crossing and Grade Separate Holdon Rd.

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

CN Junction

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	26950	$404,250
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	3850	$519,750
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	2	$220,000
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
f. #33's	Each	$720,000	0	$0
4. Bridges				
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	0	$0
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
3. Grade-Separation Crossing				
a. Bridge	SF	$100	0	$0
b. Roadway (earthwork & paving)	SY	$50	0	$0
c. New 2 Lane Roadway and Grade Seperatior	LS	$8,000,000	0	$0
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	0	$0
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	1	$250,000
b. Per Mile	Mile	$750,000	0.73	$547,500
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		0	$582,450
			CONSTRUCTION TOTAL	$2,523,950
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0	$504,790
			CONSTRUCTION & MITIGATION SUBTOTAL	$3,028,740
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0	$176,676
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0	$151,437
X. RIGHT OF WAY	ACRE	$ 250,000	0	$0
XI. TAX (8.2%)			0	$206,964
			TOTAL	$3,563,817

Assumptions: ***Track Miles***

$ 4,881,942 / mile

1 New Track from MP 154.55 to MP 155.28 *0.73*

0.73

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Still Creek to CN Junction

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	34559	$518,385
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	4937	$666,495
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	1	$160,000
f. #33's	Each	$360,000	0	$0
g. #48's	Each	$500,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	2	$640,000
f. #33's	Each	$720,000	0	$0
4. Bridges				
a.	TF	$8,000	0	$0
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	60	$6,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 153.94 Grandview St. Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
3. Grade-Separation Crossing				
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	1	$200,000
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	9	$2,250,000
b. Per Mile	Mile	$750,000	3.4	$2,550,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (40%)	LS		0	$2,105,702
			CONSTRUCTION TOTAL	$9,124,707
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0	$1,824,941
			CONSTRUCTION & MITIGATION SUBTOTAL	$10,949,648
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0	$638,729
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0	$547,482
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			0	$748,226
			TOTAL	$12,884,086

Assumptions: ***Track Miles***

$ 13,779,212 / mile

1 New Track from MP 153.8 to MP 155.5 *0.94*

but only build 4937' of new *0.94*

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Vancouver Terminal Control System

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	0	$0
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	0	$0
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
g. #48's	Each	$500,000	0	$0
3. Crossovers				
4. Bridges				
a.	TF	$8,000	0	$0
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	0	$0
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
3. Grade-Separation Crossing				
a. Bridge	SF	$100	0	$0
b. Roadway (earthwork & paving)	SY	$50	0	$0
c. Misc. (non-typical per project)	LS	$1	0	$0
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	0	$0
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	10	$2,500,000
b. Per Mile	Mile	$750,000	1.2	$900,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (40%)	LS		0	$1,360,000
			CONSTRUCTION TOTAL	$4,760,000
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0	$952,000
			CONSTRUCTION & MITIGATION SUBTOTAL	$5,712,000
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0	$333,200
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0	$285,600
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			0	$390,320
			TOTAL	$6,721,120

Assumptions: ***Track Miles***

$ 3,429,143 / mile

1 New Track from MP 149.8 to MP 151.76 *1.96*

1.96

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Sperling to Willington Junction

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	72441.6	$1,086,624
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	10348.8	$1,397,088
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	3	$480,000
f. #33's	Each	$360,000	0	$0
g. #48's	Each	$500,000	0	$0
3. Crossovers				
4. Bridges				
a.	TF	$8,000	0	$0
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	60	$36,000
b. Minor Culverts (<36" Diameter)	LF	$100	180	$18,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
3. Grade-Separation Crossing				
a. Bridge	SF	$100	0	$0
b. Roadway (earthwork & paving)	SY	$50	0	$0
c. Misc. (non-typical per project)	LS	$1	0	$0
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	0	$0
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	3	$750,000
b. Per Mile	Mile	$750,000	1.96	$1,470,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (40%)	LS		0	$2,095,085
		CONSTRUCTION TOTAL		$7,332,797
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0	$1,466,559
	CONSTRUCTION & MITIGATION SUBTOTAL			$8,799,356
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0	$513,296
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0	$439,968
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			0	$601,289
			TOTAL	$10,353,909

Assumptions: ***Track Miles***

$ 5,282,607 / mile

1 New Track from MP 149.8 to MP 151.76 *1.96*

1.96

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Brunette to Piper Siding

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	99792	$1,496,880
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	14256	$1,924,560
b. Rehab Track	TF	$60	2000	$120,000
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	4	$440,000
c. #15's	Each	$135,000	1	$135,000
d. #20's	Each	$160,000	1	$160,000
f. #33's	Each	$360,000	0	$0
g. #48's	Each	$500,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	2	$440,000
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	2	$640,000
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. MP 145.33 Brunette River 209' CBG	TF	$8,000	209	$1,672,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	180	$108,000
b. Minor Culverts (<36" Diameter)	LF	$100	210	$21,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 147.22 Caribou Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
3. Grade-Separation Crossing				
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	1	$200,000
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	14	$3,500,000
b. Per Mile	Mile	$750,000	2.7	$2,025,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (40%)	LS		0	$5,164,226
			CONSTRUCTION TOTAL	$18,074,791
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0	$3,614,958
			CONSTRUCTION & MITIGATION SUBTOTAL	$21,689,749
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0	$1,265,235
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0	$1,084,487
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			0	$1,482,133
			TOTAL	$25,521,605

Assumptions: ***Track Miles***

$ 9,452,446 / mile

1 New Track from MP 145.5 to MP 148.2 *2.7*

2.7

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Fraser River Bridge

	UNITS	UNIT COST	QUANTITY	TOTAL
The information needed to make a more detailed conceptual estimate requires extensive engineering. No design work has been conducted. The estimate is based on the expected magnitude compared to other similar projects. Expected components of the project include *New north and south approaches on BNSF route to allow higher speed* *Replace swing span of existing bridge with vertical lift span* *Second main track between north end of Fraser River Bridge and current end of second main track at Spruce* *Close or grade separate grade crossings between Fraser River Bridge and Braid*	LS	$500,000,000	1	$500,000,000

Scott Road Station

	UNITS	UNIT COST	QUANTITY	TOTAL
No design work has been conducted. Estimate based on anticipated cost of similar magnitude projects.	LS	$75,000,000	1	$75,000,000

Marysville to Mount Vernon High Speed Track

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	1271793.6	$19,076,904
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	181684.8	$24,527,448
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	3	$330,000
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
e. #24's	Each	$170,000	2	$340,000
f. #33's	Each	$360,000	1	$360,000
g. #48's	Each	$500,000	1	$500,000
3. Crossovers				
b. #11's	Each	$220,000	3	$660,000
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
f. #33's	Each	$720,000	1	$720,000
4. Bridges				
a. MP 37.7 Modify existing bridge for increased speed	LS	$5,000,000	1	$5,000,000
b. MP 38.3 Modify existing bridge for increased speed	LS	$5,000,000	1	$5,000,000
c. MP 40.94 8' Concrete Arch	TF	$8,000	8	$64,000
d. MP 47.32 8' Concrete Arch (2 tracks)	TF	$8,000	16	$128,000
e. MP 49.20 323' Thru Riveted Truss Bridge (2 tracks)	TF	$8,000	646	$5,168,000
f. MP 49.52 762' Thru Plate Girder Bridge (2 tracks)	TF	$8,000	1524	$12,192,000
g. MP 50.10 633' Wood Pile Trestle Bridge	TF	$8,000	633	$5,064,000
h. MP 50.51 1,472 Thru Riveted Truss Bridge	TF	$8,000	1472	$11,776,000
i. MP 50.76 57' Wood Pile Trestle Bridge	TF	$8,000	57	$456,000
j. MP 51.32 399' BDPT Bridge	TF	$8,000	399	$3,192,000
k. MP 51.57 151' Wood Pile Trestle Bridge	TF	$8,000	151	$1,208,000
l. MP 51.76 202' Wod Pile Trestle Bridge	TF	$8,000	202	$1,616,000
m. MP 52.83 180' Wood Pile Trestle Bridge	TF	$8,000	180	$1,440,000
n. MP 53.30 53' Wood Pile Trestle Bridge	TF	$8,000	53	$424,000
o. MP 53.50 204' Wood Pile Trestle Bridge	TF	$8,000	204	$1,632,000
p. MP 54.10 500' Wood Pile Trestle Bridge	TF	$8,000	500	$4,000,000
q. MP 56.32 43' Wood Pile Trestle Bridge	TF	$8,000	43	$344,000
r. MP 60.04 82' BDPT Bridge	TF	$8,000	82	$656,000
s. MP 61.34 119' Wood Pile Trestle Bridge	TF	$8,000	119	$952,000
t. MP 62.65 107' Wood Pile Trestle Bridge	TF	$8,000	107	$856,000
a. Major Culverts (>36" Diameter)	LF	$600	150	$90,000
b. Minor Culverts (<36" Diameter)	LF	$100	1470	$147,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 39.32 Grove Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250

b. MP 39.83 80th Street N.E. Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
c. MP 40.02 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
d. MP 40.11 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
e. MP 40.60 88th Street N.E. Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
f. MP 40.80 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
g. MP 41.34 104th St. N.E. Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
h. MP 42.04 116th St. N.E. Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
i. MP 42.45 Public Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
j. MP 42.55 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
k. MP 42.81 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
l. MP 43.10 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
m. MP 43.33 Public Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
o. MP 45.50 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
p. MP 45.90 172nd St N.E. Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	120	$60,000
2. Crossing Approaches	SY	$75	350	$26,250
q. MP 47.99 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
r. MP 48.37 Sill Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	120	$60,000
2. Crossing Approaches	SY	$75	350	$26,250
s. MP 48.81 212th NW Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	120	$60,000
2. Crossing Approaches	SY	$75	350	$26,250
t. MP 49.95 14th Avenue NE Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
u. MP 50.17 227th St. NW Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
v. MP 51.01 28th Ave. NW Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000

2. Crossing Approaches	SY	$75	350	$26,250
w. MP 51.87 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
x. MP 52.39 Valde Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
y. MP 53.35 Miller Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
z. MP 55.40 271st Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
aa. MP 56.20 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
ab. MP 56.92 Logan Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
ac. MP 57.42 Detting Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
ad. MP 57.94 Old Pacific Highway Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
ae. MP 58.15 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
af. MP 58.26 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
ag. MP 58.33 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
ah. MP 58.55 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
ai. MP 58.82 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
aj. MP 58.86 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
ak. MP 59.38 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
al. MP 59.65 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
am. MP 59.84 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
an. MP 60.28 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
ao. MP 61.20 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
ap. MP 61.55 Private Road Crossing				

	1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
	2. Crossing Approaches	SY	$75	175	$13,125
	aq. MP 61.88 Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
	2. Crossing Approaches	SY	$75	175	$13,125
	ar. MP 62.06 Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
	2. Crossing Approaches	SY	$75	175	$13,125
	as. MP 62.50 Spruce Street Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	at. MP 62.56 Spruce Street Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	au. MP 62.58 Johnson Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	av. MP 64.58 Stack Pole Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	aw. MP 65.60 Hickok Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	ax. MP 66.06 Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
	2. Crossing Approaches	SY	$75	175	$13,125
	ay. MP 67.12 Public Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	c. Misc. (non-typical per project)	LS	$1	0	$0
	4. Crossing Signals				
	a. Upgrade Signal - Barrier Gates	Each	$200,000	25	$5,000,000
	b. New Signal	Each	$250,000	25	$6,250,000
IV.	RR SIGNALS				
	a. Per P.O. T.O.	Each	$250,000	11.5	$2,875,000
	b. Per Mile	Mile	$750,000	34.41	$25,807,500
V.	UTILITY RELOCATION/ADJUSTMENT				
	1. Transmission Lines	LS	$1	0	$0
	2. Fiber Optic Lines	LF	$95	0	$0
	3. Miscellaneous	LS	$1,000,000	0	$0
VI.	CONTINGENCIES (30%)	LS		0	$45,032,243
				CONSTRUCTION TOTAL	$195,139,720
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		0	$39,027,944
			CONSTRUCTION & MITIGATION SUBTOTAL		$234,167,664
VIII.	ENGINEERING/ADMINISTRATION (7%)	LS		0	$13,659,780
IX.	CONSTRUCTION MANAGEMENT (6%)	LS		0	$11,708,383
X.	RIGHT OF WAY	ACRE	$250,000	7	$1,625,000
XI.	TAX (8.2%)			0	$16,001,457
				TOTAL	$277,162,285

Assumptions:	***Track Miles***	
1 New Tracks from MP 39.19 to MP 43.8	*4.61*	
2 New Tracks from MP 43.8 to MP 49.9	*12.2*	*$ 8,054,702 / mile*
1 New Track from MP 49.9 to MP 67.5	*17.6*	
	34.41	

**Private Crossings are to be closed or equiped with auto gates.*

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Burlington to Bellingham High Speed Track

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	528528	$7,927,920
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	75504	$10,193,040
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
e. #24's	Each	$170,000	1	$170,000
f. #33's	Each	$360,000	1	$360,000
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. ~MP 73.00 4,500 New Flyover	TF	$8,000	4500	$36,000,000
a. ~MP 73.30 New 40' Bridge	TF	$8,000	40	$320,000
c. MP 75.38 65' Wood Pile Trestle Bridge	TF	$8,000	65	$520,000
d. MP 75.63 80' Thru Plate Girder Bridge	TF	$8,000	80	$640,000
e. MP 77.00 70' Wood Pile Trestle Bridge	TF	$8,000	70	$560,000
f. MP 78.85 37' Wood Pile Trestle Bridge	TF	$8,000	37	$296,000
h. MP 82.14 New 15,100' Bridge	TF	$3,000	15100	$45,300,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	840	$84,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 72.24 Avon Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
b. MP 72.81 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
c. MP 73.30 Gear Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
d. MP 74.33 Cook Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
e. MP 74.82 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
f. MP 77.10 Woreline Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
g. MP 77.32 Ershig Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000

	2. Crossing Approaches	SY	$75	350	$26,250
	h. MP 79.02 Bowhill Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	i. MP 80.94 Colony Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	j. MP 81.21 S. Blanchard Rd. Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	k. MP 81.41 S. Legg Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	l. MP 81.31 N. Legg Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	3. Grade-Separation Crossing				
	a. Bridge	SF	$100	0	$0
	b. Roadway (earthwork & paving)	SY	$50	0	$0
	c. Misc. (non-typical per project)	LS	$1	0	$0
	4. Crossing Signals				
	a. Upgrade Signal - Barrier Gates	Each	$200,000	10	$2,000,000
	b. New Signal	Each	$250,000	1	$250,000
IV.	RR SIGNALS				
	a. Per P.O. T.O.	Each	$250,000	2.5	$625,000
	b. Per Mile	Mile	$750,000	14.3	$10,725,000
V.	UTILITY RELOCATION/ADJUSTMENT				
	1. Transmission Lines	LS	$1	0	$0
	2. Fiber Optic Lines	LF	$95	0	$0
	3. Miscellaneous	LS	$1,000,000	0	$0
VI.	CONTINGENCIES (30%)	LS		0	$34,976,913
				CONSTRUCTION TOTAL	$151,566,623
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		0	$30,313,325
			CONSTRUCTION & MITIGATION SUBTOTAL		$181,879,948
VIII.	ENGINEERING/ADMINISTRATION (7%)	LS		0	$10,609,664
IX.	CONSTRUCTION MANAGEMENT (6%)	LS		0	$9,093,997
X.	RIGHT OF WAY	ACRE	$250,000	15	$3,840,000
XI.	TAX (8.2%)			0	$12,428,463
				TOTAL	$217,852,072

Assumptions: ***Track Miles***

$ 15,234,411 / mile

1 New Track from MP 72.2 to MP 86.5	*14.3*
New Alignments from MP 80.95 To 82.16 & MP 73.00 To MP 74.30	*14.3*

**Private Crossings are to be closed or equiped with auto gates.*

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Bellingham to Blaine High Speed Track

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	575836.8	$8,637,552
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	82262.4	$11,105,424
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	1	$360,000
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. ~MP 102.4 2500' New Flyover Bridge	TF	$8,000	2500	$20,000,000
b. MP 105.70 121' Thru Plate Girder Bridge	TF	$8,000	121	$968,000
c. MP 105.84 486' TRT	TF	$8,000	486	$3,888,000
d. MP 117.08 330' Deck Plate Girder Bridge	TF	$8,000	330	$2,640,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	60	$36,000
b. Minor Culverts (<36" Diameter)	LF	$100	630	$63,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	14000	$840,000
2. At-Grade Crossing				
a1. MP 101.63 Country Lane				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
a2. MP 103.62 Slater Road				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
a. MP 105.06 Hovander Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
b. MP 106.01 2nd Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
c. MP 106.21 Washington Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
d. MP 107.07 Thonrton Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
e. MP 108.60 Brown Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
f. MP 109.06 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000

	2. Crossing Approaches	SY	$75	175	$13,125
	g. MP 109.32 Grandview Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	h. MP 110.90 Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
	2. Crossing Approaches	SY	$75	175	$13,125
	i. MP 111.77 Main Street Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	j. MP 112.29 Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
	2. Crossing Approaches	SY	$75	175	$13,125
	k. MP 113.08 Valley View Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	l. MP 113.60 Birch Bay Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	m. MP 115.03 Loomis Trail Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	n. MP 116.42 Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
	2. Crossing Approaches	SY	$75	175	$13,125
	3. Grade-Separation Crossing				
	a. Bridge	SF	$100	0	$0
	b. Roadway (earthwork & paving)	SY	$50	0	$0
	c. Misc. (non-typical per project)	LS	$1	0	$0
	4. Crossing Signals				
	a. Upgrade Signal - Barrier Gates	Each	$200,000	12	$2,400,000
	b. New Signal	Each	$250,000	4	$1,000,000
IV.	RR SIGNALS				
	a. Per P.O. T.O.	Each	$250,000	1.5	$375,000
	b. Per Mile	Mile	$750,000	15.58	$11,685,000
V.	UTILITY RELOCATION/ADJUSTMENT				
	1. Transmission Lines	LS	$1	0	$0
	2. Fiber Optic Lines	LF	$95	0	$0
	3. Miscellaneous	LS	$1,000,000	0	$0
VI.	CONTINGENCIES (30%)	LS		0	$19,435,643
				CONSTRUCTION TOTAL	$84,221,119
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		0	$16,844,224
			CONSTRUCTION & MITIGATION SUBTOTAL		$101,065,343
VIII.	ENGINEERING/ADMINISTRATION (7%)	LS		0	$5,895,478
IX.	CONSTRUCTION MANAGEMENT (6%)	LS		0	$5,053,267
X.	RIGHT OF WAY	ACRE	$250,000	20	$4,877,500
XI.	TAX (8.2%)			0	$6,906,132
				TOTAL	$123,797,720

Assumptions: ***Track Miles***

$ 7,945,938 / mile

1 New Track from MP 101.5 to MP 117.08 *15.58*

15.58

**Private Crossings are to be closed or equiped with auto gates.*

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Everett Junction to Everett Second Main Track

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	36960	$554,400
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	5280	$712,800
b. Rehab Track	TF	$60	3600	$216,000
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	1	$160,000
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	2	$640,000
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. MP 1784.0 48' DPG Bond Street	TF	$8,000	48	$384,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	900	$90,000
6. Other Drainage	LS	$0	0	$0
7. Retaining Walls	SF	$45	14400	$648,000
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a.				
1. Concrete Crossing Panels Installec	TF	$500	0	$0
2. Crossing Approaches	SY	$75	0	$0
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	0	$0
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	5	$1,250,000
b. Per Mile	Mile	$750,000	1	$750,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		0	$1,621,560
			CONSTRUCTION TOTAL	$7,026,760
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0	$1,405,352
		CONSTRUCTION & MITIGATION SUBTOTAL		$8,432,112
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0	$491,873
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0	$421,606
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			0	$576,194
			TOTAL	$9,921,785

Assumptions: *Track Miles*

$ 9,921,785 / mile

New Track from MP 1783.6 To 1784.6 *1*

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

White Rock Bypass

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	632385.6	$9,485,784
5. Tunnel	Mile	$100,000,000	0.5	$50,000,000
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	90340.8	$12,196,008
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
g. #48's	Each	$500,000	1	$500,000
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. I-5 Ramp and Freeway 2500' Flyover Bridge	TF	$8,000	2500	$20,000,000
b. 0.5 Mile Cambell River Bridge	TF	$8,000	2640	$21,120,000
c. 700' Nicomekl River Bridge (2 tracks)	TF	$8,000	1400	$11,200,000
d. 400' Serpentine River Bridge (2 tracks)	TF	$8,000	800	$6,400,000
e. BC Rail Flyover (2 tracks)	TF	$8,000	400	$3,200,000
f. 400' Colebrook Bridge (2 tracks)	TF	$8,000	160	$1,280,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	0	$0
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. Pipeline Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
b. Boblett Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
c. Street Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
d. Tellie Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
e. Highway 15 Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
f. Highway 99A Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
g. 10 Unnamed Road Crossings				

	1. Concrete Crossing Panels Installec	TF	$500	600	$300,000
	2. Crossing Approaches	SY	$75	3500	$262,500
	3. Grade-Separation Crossing				
	a. Bridge	SF	$100	0	$0
	b. Roadway (earthwork & paving)	SY	$50	0	$0
	c. Misc. (non-typical per project)	LS	$1	0	$0
	4. Crossing Signals				
	a. Upgrade Signal - Barrier Gates	Each	$200,000	0	$0
	b. New Signal	Each	$250,000	16	$4,000,000
IV.	RR SIGNALS				
	a. Per P.O. T.O.	Each	$250,000	1	$250,000
	b. Per Mile	Mile	$750,000	17.11	$12,832,500
V.	UTILITY RELOCATION/ADJUSTMENT				
	1. Transmission Lines	LS	$1	0	$0
	2. Fiber Optic Lines	LF	$95	0	$0
	3. Miscellaneous	LS	$1,000,000	0	$0
VI.	CONTINGENCIES (30%)	LS		0	$46,009,288
				CONSTRUCTION TOTAL	$199,373,580
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		0	$39,874,716
				CONSTRUCTION & MITIGATION SUBTOTAL	$239,248,296
VIII.	ENGINEERING/ADMINISTRATION (7%)	LS		0	$13,956,151
IX.	CONSTRUCTION MANAGEMENT (6%)	LS		0	$11,962,415
X.	RIGHT OF WAY	ACRE	$250,000	104	$25,924,242
XI.	TAX (8.2%)			0	$16,348,634
				TOTAL	$307,439,737

Assumptions: ***Track Miles***

$ 17,968,424 / mile

1 New Track from MP 117.08 to MP 130.75
along a new alignment *9.91*
2nd Track from MP 123.3 to MP 130.5 *7.2*
17.11

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Colebrook to Brownsville High Speed Track

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	104450.08	$2,089,002
2. Excavation	CY	$10	141250.56	$1,412,506
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	650496	$9,757,440
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	92928	$12,545,280
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
e. #24's	Each	$170,000	1	$170,000
f. #33's	Each	$360,000	0	$0
g. #48's	Each	$500,000	1	$500,000
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. MP 135.10 Couger Creek, 48' RCT	TF	$8,000	48	$384,000
b. MP 135.3 24' RCT	TF	$8,000	24	$192,000
c. MP 137.41 42' PT	TF	$8,000	42	$336,000
d. MP 138.23 90' CTG	TF	$8,000	90	$720,000
e. MP 140.31 39' BDPT	TF	$8,000	39	$312,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	60	$36,000
b. Minor Culverts (<36" Diameter)	LF	$100	630	$63,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 131.37 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
b. MP 134.95 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
c. MP 137.03 River Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
d. MP 138.94 Public Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
e. MP 140.48 Tannery Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
3. Grade-Separation Crossing				
a. Bridge	SF	$100	0	$0
b. Roadway (earthwork & paving)	SY	$50	0	$0
c. Misc. (non-typical per project)	LS	$1	0	$0
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	3	$600,000

	b. New Signal	Each	$250,000	2	$500,000
IV.	RR SIGNALS				
	a. Per P.O. T.O.	Each	$250,000	2	$500,000
	b. Per Mile	Mile	$750,000	17.6	$13,200,000
V.	UTILITY RELOCATION/ADJUSTMENT				
	1. Transmission Lines	LS	$1	0	$0
	2. Fiber Optic Lines	LF	$95	0	$0
	3. Miscellaneous	LS	$1,000,000	0	$0
VI.	CONTINGENCIES (30%)	LS		0	$13,062,668
			CONSTRUCTION TOTAL		$56,604,895
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		0	$11,320,979
		CONSTRUCTION & MITIGATION SUBTOTAL			$67,925,874
VIII.	ENGINEERING/ADMINISTRATION (7%)	LS		0	$3,962,343
IX.	CONSTRUCTION MANAGEMENT (6%)	LS		0	$3,396,294
X.	RIGHT OF WAY	ACRE	$250,000	0	$0
XI.	TAX (8.2%)			0	$4,641,601
				TOTAL	$79,926,112

Assumptions: ***Track Miles***

$ 4,541,256 / mile

2 New Track from MP 130.75 to MP 139	*16.5*
1 New Track from MP 139.0 to MP 140.1	*1.1*
	17.6

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Advanced Signal System (Seattle - Blaine)

	UNITS	UNIT COST	QUANTITY	TOTAL
Advanced signal system for high speed track between Seattle and Blaine	LS	$138,000,000	1	$138,000,000

An Advanced Signal System that provides at least cab signal indications, and as much as enforcement of compliance with cab signal indications is required by federal regulation for a speed of more than seventy-nine mph. Several systems are being developed that include elements of positive train separation or positive train control systems, which not only provide cab signal indications but also will control a train to prevent overrunning speed restrictions or movement authority. None of the systems being developed are ready for evaluation for use on the PNWRC.

Advanced Signal System (Blaine - Brownsville)

	UNITS	UNIT COST	QUANTITY	TOTAL
Advanced signal system for high speed track between Blaine - Brownsville	LS	$60,000,000	1	$60,000,000

An Advanced Signal System that provides at least cab signal indications, and as much as enforcement of compliance with cab signal indications is required by federal regulation for a speed of more than seventy-nine mph. Several systems are being developed that include elements of positive train separation or positive train control systems, which not only provide cab signal indications but also will control a train to prevent overrunning speed restrictions or movement authority. None of the systems being developed are ready for evaluation for use on the PNWRC.

Felida Crossover

	UNITS	UNIT COST	QUANTITY	TOTAL
2 No. 24 Power Crossovers (completed) Final cost	LS	$2,196,934	1	$2,196,934

Woodland Crossover

	UNITS	UNIT COST	QUANTITY	TOTAL
2 No. 24 Power Crossovers (completed) Final cost	LS	$2,769,092	1	$2,769,092

Titlow Crossover

	UNITS	UNIT COST	QUANTITY	TOTAL
2 No. 24 Power Crossovers Preliminary Engineering Estimate furnished by BNSF	LS	$3,970,000	1	$3,970,000

Ruston Crossover

	UNITS	UNIT COST	QUANTITY	TOTAL
2 No. 24 Power Crossovers Preliminary Engineering Estimate furnished by BNSF	LS	$3,500,000	1	$3,500,000

Sound Transit Phase 1 and 2

	UNITS	UNIT COST	QUANTITY	TOTAL
Estimate and description furnished by BNSF includes the following components: *CTC Tacoma - Seattle* *Third main track at Tacoma MP 1.6 - Reservation* *Alignment change and speed increase at Tacoma MP 40 - MP 39.5* *Connection to Tacoma Rail at Reservation* *No. 24 crossover River Road MP 37.8* *No. 24 crossover MP 37* *No. 24 crossover MP 29.7* *No. 24 crossover MP 24* *Controlled siding adjacent to Auburn Yard, No 24 switch access to both ends of Auburn Yard-No 20 turnouts* *No. 24 crossover MP 21* *No. 24 crossover MP 17* *Controlled siding MP 15.8 - MP 11.4* *Crossover between Main 2 and siding MP 13.2* *Third Main Track Tukwila - Seattle including extensive rearrangement of main tracks and yard tracks to separate freight car storage and switching from through operation.* *Changes to Tukwila, Black River, and Argo interlockings to allow higher speed* *No. 24 crossover MP 6.5* *No. 20 crossover MP 2.2* *Alignment change between MP 1.2 and MP 0.3* *King Street Station: rehab all tracks, construct one new track, changes in turnout arrangement at both ends of station to facilitate passenger train movements, power switches both ends of station*	LS	$264,000,000	1	$264,000,000

Vancouver Rail Project

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$ 20	25,000	$ 500,000
2. Excavation	CY	$ 10	786,000	$ 7,860,000
3. Rock Excavation	CY	$ 50	0	$ -
II. TRACK				
1. Track Construction				
a. New Track	TF	$ 135	41,420	$ 5,591,700
b. Rehab Track	TF	$ 60	6,375	$ 382,500
c. Yard Track	TF	$ 83	2,465	$ 204,595
2. Track and Turnout Removal/Relocation				
a. Relocate turnout	EA	$ 17,325	1	$ 17,325
b. Remove track	TF	$ 8	5,445	$ 43,560
c. Remove turnout	EA	$ 11,025	17	$ 187,425
3. Turnouts				
a. #9's	EA	$ 100,000	1	$ 100,000
b. #11's	EA	$ 110,000	12	$ 1,320,000
c. #15's	EA	$ 135,000	2	$ 270,000
d. #20's	EA	$ 160,000	0	$ -
e. #24's	EA	$ 170,000	3	$ 510,000
4. Crossovers				
a. #9's	EA	$ 200,000	0	$ -
b. #11's	EA	$ 220,000	5	$ 1,100,000
c. #15's	EA	$ 270,000	4	$ 1,080,000
d. #20's	EA	$ 320,000	2	$ 640,000
e. #24's	EA	$ 340,000	4	$ 1,360,000
5. Bridges				
a. New Bridge				
6. Culvert Crossings				
a. Major Culverts	LF	$ 600	0	$ -
b. Minor Culverts	LF	$ 100	0	$ -
7. Other Drainage	LS			
8. Retaining Walls	SF	$ 45	81,145	$ 3,651,525
III. ROADWAY				
1. Roadway Construction	SY	$ 60	0	$ -
2. At-Grade Crossing				
a. Track Crossing	TF	$ 500	0	$ -
b. Crossing Approaches	SY	$ 75	0	$ -
3. Grade-Separation Crossing				
a. Bridge	SF	$ 120	28,800	$ 3,456,000
b. Roadway (earthwork & paving)	SY	$ 50	6,570	$ 328,500
c. MSE wall	SF	$ 20	22,600	$ 452,000
d. Embankment (fill)	CY	$ 20	19,500	$ 390,000
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	EA	$ 200,000	0	$ -
b. New Signal	EA	$ 250,000	0	$ -
IV. RR SIGNALS				
a. Per P.O. T.O.	EA	$ 250,000	25	$ 6,250,000
b. Per Mile	MI	$ 750,000	10	$ 7,500,000
V. UTILITY RELOCATION/ADJUSTMENT				
1. Transmission Lines	LS	$ 1	0	$ -
2. Fiber Optic Lines	LF	$ 95	0	$ -
3. Miscellaneous	LS	$ 1	0	$ 500,000
VI. CONTINGENCIES (30%)	LS			$ 13,108,539
			CONSTRUCTION TOTAL	$ 56,803,669
VII. ENVIRONMENTAL MITIGATION (10%)	LS			$ 5,680,367
			CONSTRUCTION & MITIGATION SUBTOTAL	$ 62,484,036
VIII. ENGINEERING/ADMINISTRATION (7%)	LS			$ 3,976,257
IX. CONSTRUCTION MANAGEMENT (6%)	LS			$ 3,408,220
X. RIGHT OF WAY	ACRE	$ 50,000	24	$ 1,200,000
XI. TAX (8.2%)				$ 5,729,218
			TOTAL	$ 76,797,731

Note: This information was developed in the preliminary engineering process. Unit costs and quantity count method shown may vary from those in the conceptual estimates for other projects.

Kelso to Martin's Bluff Rail Project

	UNITS	UNIT COST	QUANTITY	TOTAL
I. SITE WORK				
1. Embankment	CY	$ 20	1,301,736	$ 26,034,720
2. Common Excavation	CY	$ 10	971,969	$ 9,719,690
3. Rock Excavation	CY	$ 50	232,439	$ 11,621,950
4. Clear & Grub	AC	$ 4,000	228	$ 912,000
5. Seeding	AC	$ 2,000	114	$ 228,000
6. Place Topsoil	CY	$ 10	60,693	$ 606,930
7. Subballast	CY	$ 25	282,962	$ 7,074,050
8. Erosion Controls	LS	$ 1,000,000	1	$ 1,000,000
II. TRACK				
1. Track Construction				
a. New Track	TF	$ 135	120,647	$ 16,287,345
b. Rehab Track	TF	$ 60	2,047	$ 122,820
c. Yard Track	TF	$ 83	119,412	$ 9,911,196
d. Lineover Track	TF	$ 15	87,336	$ 1,310,033
2. Track and T.O. Removal/Relocation				
a. Remove turnout	EA	$ 11,025	37	$ 407,925
b. Remove track	TF	$ 8	4,312	$ 34,496
3. Turnouts				
a. #9's	EA	$ 100,000	22	$ 2,200,000
b. #11's	EA	$ 110,000	48	$ 5,280,000
c. #15's	EA	$ 135,000	9	$ 1,215,000
d. #20's	EA	$ 160,000	41	$ 6,560,000
e. #24's	EA	$ 170,000	13	$ 2,210,000
5. Bridges				
a. Coweeman River Bridge	EA	$ 2,305,000	1	$ 2,305,000
b. MP 101.63	EA	$ 288,000	1	$ 288,000
c. Owl Creek Bridge	EA	$ 840,000	1	$ 840,000
b. Kalama River Bridge	EA	$ 9,504,000	1	$ 9,504,000
6. Culvert Crossings				
a. Major Culverts	LF	$ 600	247	$ 148,200
b. Minor Culverts	LF	$ 100	891	$ 89,100
7. Other Drainage	LS	$ 5,000,000	1	$ 5,000,000
8. Retaining Walls CIP	SF	$ 45	331,075	$ 14,898,353
9. Soldier Pile Retaining Walls	SF	$ 105	127,450	$ 13,382,250
III. ROADWAY				
1. Roadway Construction	SY	$ 60	10,784	$ 647,040
2. At-Grade Crossing				
a. Track Crossing	TF	$ 500	390	$ 195,000
b. Crossing Approaches	SY	$ 75	225	$ 16,875
3. Crossing Signals				
a. Upgrade Signal - Barrier Gates	EA	$ 200,000	4	$ 800,000
4. Overhead Bridges				
a. Kalama River Road	LS	$ 5,000,000	1	$ 5,000,000
b. Oak Street Bridge	LS	$ 5,000,000	1	$ 5,000,000
c. Pedestrian Bridge	LS	$ 2,500,000	1	$ 2,500,000
IV. RR SIGNALS				
a. Control Points	LS	$ 16,115,605	1	$ 16,115,605
b. Per Mile	MI	$ 250,000	28	$ 7,070,000
V. UTILITY RELOCATION/ADJUSTMENT				
1. Miscellaneous Relocations	LS	$ 10,918,445	1	$ 10,918,445
VI. CONTINGENCIES (30%)	LS			$ 59,236,207
			CONSTRUCTION SUBTOTAL	$ 256,690,229
VII. ENVIRONMENTAL MITIGATION (20%)	LS			$ 51,338,046
WETLAND COMPENSATION	AC	$ 55,000	317	$ 17,460,300
			CONSTRUCTION & MITIGATION SUBTOTAL	$ 325,488,574
VIII. ENGINEERING/ADMINISTRATION (7%)	LS			$ 17,968,316
XI. CONSTRUCTION MANAGEMENT (6%)	LS			$ 15,401,414
VII. RIGHT OR WAY ACQUISITION	AC	$ 250,000	60	$ 15,000,000
XII. TAX (8.2%)	LS			$ 21,048,599
			TOTAL	$ 394,906,903

Leary Crossover

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	2600	$52,000
2. Excavation	CY	$10	2600	$26,000
3. Rock Excavation	CY	$50	0	$0
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	0	$0
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
e. #24's	Each	$340,000	1	$340,000
4. Bridges				
a.	TF	$8,000	0	$0
5. Culvert Crossings				
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 58.01 Main Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	0	$0
2. Crossing Approaches	SY	$75	0	$0
4. Crossing Signals				
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	2	$500,000
b. Per Mile	Mile	$750,000	0	$0
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		30%	$275,400
			CONSTRUCTION TOTAL	$1,193,400
VII. ENVIRONMENTAL MITIGATION (20%)	LS		20%	$238,680
			CONSTRUCTION & MITIGATION SUBTOTAL	$1,432,080
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		7%	$83,538
IX. CONSTRUCTION MANAGEMENT (6%)	LS		6%	$71,604
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			8.2%	$97,859
			TOTAL	$1,685,081

Pattison Crossover

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	2600	$52,000
2. Excavation	CY	$10	2600	$26,000
3. Rock Excavation	CY	$50	0	$0
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	0	$0
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
e. #24's	Each	$340,000	1	$340,000
4. Bridges				
a.	TF	$8,000	0	$0
5. Culvert Crossings				
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 58.01 Main Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	0	$0
2. Crossing Approaches	SY	$75	0	$0
4. Crossing Signals				
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	2	$500,000
b. Per Mile	Mile	$750,000	0	$0
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		30%	$275,400
			CONSTRUCTION TOTAL	$1,193,400
VII. ENVIRONMENTAL MITIGATION (20%)	LS		20%	$238,680
			CONSTRUCTION & MITIGATION SUBTOTAL	$1,432,080
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		7%	$83,538
IX. CONSTRUCTION MANAGEMENT (6%)	LS		6%	$71,604
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			8.2%	$97,859
			TOTAL	$1,685,081

Winlock Crossover

		UNITS	UNIT COST	QUANTITY	TOTAL
I.	EARTHWORK				
	1. Embankment	CY	$20	5200	$104,000
	2. Excavation	CY	$10	5200	$52,000
	3. Rock Excavation	CY	$50	0	$0
II.	TRACK				
	1. Track Construction				
	a. New Track	TF	$135	0	$0
	b. Rehab Track	TF	$60	0	$0
	2. Turnouts				
	a. #9's	Each	$100,000	0	$0
	b. #11's	Each	$110,000	0	$0
	c. #15's	Each	$135,000	0	$0
	d. #20's	Each	$160,000	0	$0
	f. #33's	Each	$360,000	0	$0
	3. Crossovers				
	b. #11's	Each	$220,000	0	$0
	c. #15's	Each	$270,000	0	$0
	d. #20's	Each	$320,000	0	$0
	e. #24's	Each	$340,000	2	$680,000
	4. Bridges				
	a.	TF	$8,000	0	$0
	5. Culvert Crossings				
	6. Other Drainage	LS	$0	0	$0
III.	ROADWAY				
	1. Roadway Construction	SY	$60	0	$0
	2. At-Grade Crossing				
	a. MP 58.01 Main Street Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	0	$0
	2. Crossing Approaches	SY	$75	0	$0
	4. Crossing Signals				
IV.	RR SIGNALS				
	a. Per P.O. T.O.	Each	$250,000	4	$1,000,000
	b. Per Mile	Mile	$750,000	0	$0
V.	UTILITY RELOCATION/ADJUSTMENT				
VI.	CONTINGENCIES (30%)	LS		30%	$550,800
				CONSTRUCTION TOTAL	$2,386,800
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		20%	$477,360
				CONSTRUCTION & MITIGATION SUBTOTAL	$2,864,160
VIII.	ENGINEERING/ADMINISTRATION (7%)	LS		7%	$167,076
IX.	CONSTRUCTION MANAGEMENT (6%)	LS		6%	$143,208
X.	RIGHT OF WAY	ACRE	$250,000	0	$0
XI.	TAX (8.2%)			8.2%	$195,718
				TOTAL	$3,370,162

Tenino Crossover

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	5200	$104,000
2. Excavation	CY	$10	5200	$52,000
3. Rock Excavation	CY	$50	0	$0
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	0	$0
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
e. #24's	Each	$340,000	2	$680,000
4. Bridges				
a.	TF	$8,000	0	$0
5. Culvert Crossings				
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 58.01 Main Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	0	$0
2. Crossing Approaches	SY	$75	0	$0
4. Crossing Signals				
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	4	$1,000,000
b. Per Mile	Mile	$750,000	0	$0
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		30%	$550,800
			CONSTRUCTION TOTAL	$2,386,800
VII. ENVIRONMENTAL MITIGATION (20%)	LS		20%	$477,360
			CONSTRUCTION & MITIGATION SUBTOTAL	$2,864,160
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		7%	$167,076
IX. CONSTRUCTION MANAGEMENT (6%)	LS		6%	$143,208
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			8.2%	$195,718
			TOTAL	$3,370,162

Ketron Crossover

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	5200	$104,000
2. Excavation	CY	$10	5200	$52,000
3. Rock Excavation	CY	$50	0	$0
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	0	$0
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
e. #24's	Each	$340,000	2	$680,000
4. Bridges				
a.	TF	$8,000	0	$0
5. Culvert Crossings				
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
4. Crossing Signals				
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	4	$1,000,000
b. Per Mile	Mile	$750,000	0	$0
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		30%	$550,800
			CONSTRUCTION TOTAL	$2,386,800
VII. ENVIRONMENTAL MITIGATION (20%)	LS		20%	$477,360
			CONSTRUCTION & MITIGATION SUBTOTAL	$2,864,160
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		7%	$167,076
IX. CONSTRUCTION MANAGEMENT (6%)	LS		6%	$143,208
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			8.2%	$195,718
			TOTAL	$3,370,162

North Portland Junction to Kenton

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	155232	$2,328,480
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	22176	$2,993,760
b. Rehab Track	TF	$60	10560	$633,600
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	5	$550,000
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	4	$640,000
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	8	$2,560,000
e. #24's	Each	$340,000	2	$680,000
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. MP 6.03 10-TSTOD, 140'	TF	$8,000	140	$1,120,000
b. MP 6.03 DPGOD 70'	TF	$8,000	70	$560,000
c. MP 6.03 38-TSTOD, 441'	TF	$8,000	441	$3,528,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	0	$0
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 7.26 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75		$0
b. MP 7.42 N. Columbia Blvd. Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
3. Grade-Separation Crossing				
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	1	$200,000
b. New Signal	Each	$250,000		$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	29	$7,250,000
b. Per Mile	Mile	$750,000	6.2	$4,650,000
V. UTILITY RELOCATION/ADJUSTMENT				
1. Transmission Lines	LS	$1	0	$0
2. Fiber Optic Lines	LF	$95	0	$0
3. Miscellaneous	LS	$1,000,000	0	$0
VI. CONTINGENCIES (30%)	LS		30%	$8,329,527
			CONSTRUCTION TOTAL	$36,094,617
VII. ENVIRONMENTAL MITIGATION (20%)	LS		20%	$7,218,923
			CONSTRUCTION & MITIGATION SUBTOTAL	$43,313,540
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		7%	$2,526,623
IX. CONSTRUCTION MANAGEMENT (6%)	LS		6%	$2,165,677
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			8.2%	$2,959,759
			TOTAL	$50,965,599

Assumptions: ***Track Miles***

General Layout shown on track charts (MP 5.62 To MP 10.0) *4.38* *$ 11,635,982 / mile*

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Point Defiance Bypass -- River Road to Nisqually

	UNITS	UNIT COST	QUANTITY	TOTAL
I. Earthwork/Retaining Walls				
a. Earthwork	CY	$10	311190	$3,111,900
b. Retaining Walls	LF	$1,000	10250	$10,250,000
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	106200	$14,337,000
b. Rehab Track	TF	$60	55440	$3,326,400
c. Shift Track	TF	$29	15000	$435,000
d. Remove Track	TF	$8	12000	$96,000
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	2	$220,000
c. #15's	Each	$135,000	1	$135,000
d. #20's	Each	$160,000	3	$480,000
e. #24's	Each	$170,000	1	$170,000
f. #33's	Each	$360,000	0	$0
g. Relocate Turnout	Each	$17,325	7	$121,275
h. Remove Turnout	Each	$11,025	14	$154,350
3. Crossovers				
b. #11's	Each	$220,000	1	$220,000
c. #15's	Each	$270,000	7	$1,890,000
d. #20's	Each	$320,000	2	$640,000
e. #24's	Each	$340,000	5	$1,700,000
f. #33's	Each	$720,000	1	$720,000
4. Bridges				
a. Remove Bridge at Sta 53+00 (Frt House Square, single track, timber trestle)	TF	$1,000	1700	$1,700,000
c. Construct New Bridge at Sta 18+00 (Utility crossing, single track, 120')	TF	$5,000	120	$600,000
c. Construct New Bridge at Sta 35+00 (Potland Ave, single track, 150')	TF	$8,000	150	$1,200,000
c. Construct New Bridge at Sta 53+00 (Frt House Square, double track, 1700')	TF	$5,000	3400	$17,000,000
d. Construct New Bridge at Sta 382+00 (over county road, single track	TF	$8,000	50	$400,000
e. Construct New Bridge at Sta 535+00 (High Speed Flyover, single track, 4800')	TF	$10,000	4800	$48,000,000
f. Construct New Bridge at Sta 583+00 (Freight RR Bridge, single track, 2200')	TF	$8,000	2200	$17,600,000
g. Rebuild Old Pacific Highway Overpass	LS	$5,000,000	1	$5,000,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	0	$0
6. Other Drainage	Per Mile	$50,000	8.5	$425,000
7. Station Platform (25x800', grade separate pedestrian crossing)	LS	$1,500,000	3	$4,500,000
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
d. Pacific Ave.				
1. Track Crossing	TF	$500	200	$100,000
2. Crossing Approaches	SY	$75	0	$0
e. S. Wilkeson St.				
1. Track Crossing	TF	$500	72	$36,000
2. Crossing Approaches	SY	$75	0	$0
f. S. 68th St.				
1. Track Crossing	TF	$500	64	$32,000
2. Crossing Approaches	SY	$75	0	$0
g. Steilacoom Blvd. SW.				
1. Track Crossing	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	0	$0
h. 108th St. SW.				
1. Track Crossing	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	0	$0
i. Bridgeport Way SW.				
1. Track Crossing	TF	$500	80	$40,000
2. Crossing Approaches	SY	$75	0	$0
j. Chicago Ave. SW.				
1. Track Crossing	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	0	$0
k. North Thorne Lane SW.				
1. Track Crossing	TF	$500	50	$25,000
2. Crossing Approaches	SY	$75	0	$0
l. Berkeley St. SW.				
1. Track Crossing	TF	$500	60	$30,000

	2. Crossing Approaches	SY	$75	0	$0
	m. 41st Division Dr.				
	1. Track Crossing	TF	$500	90	$45,000
	2. Crossing Approaches	SY	$75	0	$0
	n. Barksdale Ave.				
	1. Track Crossing	TF	$500	140	$70,000
	2. Crossing Approaches	SY	$75	0	$0
	o. Old Pacific Hwy.				
	1. Track Crossing	TF	$500	100	$50,000
	2. Crossing Approaches	SY	$75	0	$0
	3. Grade-Separation Crossing				
	a. Bridge	SF	$100	0	$0
	b. Roadway (earthwork & paving)	SY	$50	0	$0
	c. Misc. (non-typical per project)	LS	$1	0	$0
	4. Crossing Signals				
	a. Upgrade Signal - Barrier Gates	Each	$200,000	9	$1,800,000
	b. New Signal	Each	$250,000	3	$750,000
IV.	RR SIGNALS				
	a. Per P.O. T.O.	Each	$250,000	35	$8,750,000
	b. Per Mile	Mile	$750,000	24.80	$18,600,000
	c. Electric Locks	Each	$25,000	7	$175,000
V.	UTILITY RELOCATION/ADJUSTMENT				
	1. Transmission Lines (Next to Highway)	LS	$1,000,000	1	$1,000,000
	2. Fiber Optic Lines	LF	$95	0	$0
	3. Miscellaneous	LS	$1,000,000	1	$1,000,000
VI.	CONTINGENCIES (30%)	LS		30%	$50,102,978
				CONSTRUCTION TOTAL	$217,112,903
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		20%	$43,422,581
				CONSTRUCTION & MITIGATION SUBTOTAL	$260,535,483
VIII.	ENGINEERING/ADMINISTRATION (7%)	LS		0.07	$15,197,903
IX.	CONSTRUCTION MANAGEMENT (6%)	LS		0.06	$13,026,774
X.	RIGHT OF WAY	ACRE	$250,000	16	$4,000,000
XI.	TAX (8.2%)			8.2%	$17,803,258
				TOTAL	$310,563,418

Assumptions:

This estimate includes River Road (MP 37.9) to Nisqually

Reservation 3rd Main - Stewart Avenue to River Road

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	79280	$1,189,200
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	19820	$2,675,700
b. Rehab Track	TF	$60	2200	$132,000
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	1	$135,000
d. #20's	Each	$160,000	0	$0
e. #24's	Each	$170,000	1	$170,000
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	3	$810,000
d. #20's	Each	$320,000	0	$0
e. #24's	Each	$340,000	1	$340,000
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. MP 37.57 6' Concrete Arch	TF	$8,000	6	$48,000
b. Rebuild Gay Rd. E Overpass	LS	$5,000,000	1	$5,000,000
c. Rebuild River Road Overpass	LS	$5,000,000	1	$5,000,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	90	$54,000
b. Minor Culverts (<36" Diameter)	LF	$100	270	$27,000
6. Other Drainage	LS	$0	0	$0
7. Retaining Walls	LF	$1,000	3750	$3,750,000
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 36.08 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
b. MP 35.21 52nd Ave. Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
c. MP 34.87 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
3. Grade-Separation Crossing				
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	1	$200,000
b. New Signal	Each	$250,000	2	$500,000
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	10	$2,500,000
b. Per Mile	Mile	$750,000	3.75	$2,815,341
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		30%	$7,637,622
			CONSTRUCTION TOTAL	$33,096,363
VII. ENVIRONMENTAL MITIGATION (20%)	LS		20%	$6,619,273
	CONSTRUCTION & MITIGATION SUBTOTAL			$39,715,636
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		7%	$2,316,745
IX. CONSTRUCTION MANAGEMENT (6%)	LS		6%	$1,985,782
X. RIGHT OF WAY	ACRE	$250,000	88	$22,000,000
XI. TAX (8.2%)			8.2%	$542,780
			TOTAL	$66,560,943

Assumptions: ***Track Miles***

1 New Track from Stewart Avenue to River Road *3.75* *$ 17,731,674 / mile*

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Centralia Steam Plant Coal Track and Power Switches

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	59136	$887,040
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	8448	$1,140,480
b. Rehab Track	TF	$60	16896	$1,013,760
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	1	$110,000
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	2	$320,000
e. #24's	Each	$170,000	1	$170,000
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	1	$220,000
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
e. #24's	Each	$340,000	0	$0
4. Bridges				
a. MP 53.87 ~100' Bridge	TF	$8,000	100	$800,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	60	$36,000
b. Minor Culverts (<36" Diameter)	LF	$100	60	$6,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
3. Grade-Separation Crossing				
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	0	$0
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	3	$750,000
b. Per Mile	Mile	$750,000	4.8	$3,600,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		30%	$2,715,984
			CONSTRUCTION TOTAL	$11,769,264
VII. ENVIRONMENTAL MITIGATION (20%)	LS		20%	$2,353,853
			CONSTRUCTION & MITIGATION SUBTOTAL	$14,123,117
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		7%	$823,848
IX. CONSTRUCTION MANAGEMENT (6%)	LS		6%	$706,156
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			8.2%	$965,080
			TOTAL	$16,618,201

Assumptions:

Centralia Steam Plant Coal Track MP 54.1 To MP 52.5 (#15 T.O.'s)

Steam Plant Line Power Switch

Power Crossover at North End of Centralia Yard (#11)

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Woodland Siding

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	55440	$831,600
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	7920	$1,069,200
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a1. Split Point Derail	Each	$15,000	2	$30,000
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	2	$270,000
d. #24's	Each	$170,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
4. Bridges				
a. MP 53.87 ~100' Bridge	TF	$8,000	100	$800,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	0	$0
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 115.76 Scott Ave. Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
3. Grade-Separation Crossing				
a. Bridge at MP 116.63	LF	$16,000	80	$1,280,000
b. Roadway (earthwork & paving)	SY	$50	4450	$222,500
c. Misc. (non-typical per project)	LS	$2,000,000	1	$2,000,000
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	1	$200,000
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	4	$1,000,000
b. Per Mile	Mile	$750,000	1.5	$1,125,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		30%	$2,665,365
			CONSTRUCTION TOTAL	$11,549,915
VII. ENVIRONMENTAL MITIGATION (20%)	LS		20%	$2,309,983
			CONSTRUCTION & MITIGATION SUBTOTAL	$13,859,898
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		7%	$808,494
IX. CONSTRUCTION MANAGEMENT (6%)	LS		6%	$692,995
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			8.2%	$947,093
			TOTAL	$16,308,480

Assumptions:

Woodland Siding (Leaving room for 2nd Mainline) MP 117.0 To 115.5

Grade Seperation at MP 116.63

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Newaukum Crossover

		UNITS	UNIT COST	QUANTITY	TOTAL
I.	EARTHWORK				
	1. Embankment	CY	$20	5200	$104,000
	2. Excavation	CY	$10	5200	$52,000
	3. Rock Excavation	CY	$50	0	$0
II.	TRACK				
	1. Track Construction				
	a. New Track	TF	$135	0	$0
	b. Rehab Track	TF	$60	0	$0
	2. Turnouts				
	a. #9's	Each	$100,000	0	$0
	b. #11's	Each	$110,000	0	$0
	c. #15's	Each	$135,000	0	$0
	d. #20's	Each	$160,000	0	$0
	f. #33's	Each	$360,000	0	$0
	3. Crossovers				
	b. #11's	Each	$220,000	0	$0
	c. #15's	Each	$270,000	0	$0
	d. #20's	Each	$320,000	0	$0
	e. #24's	Each	$340,000	2	$680,000
	4. Bridges				
	a.	TF	$8,000	0	$0
	5. Culvert Crossings				
	6. Other Drainage	LS	$0	0	$0
III.	ROADWAY				
	1. Roadway Construction	SY	$60	0	$0
	2. At-Grade Crossing				
	a. MP 58.01 Main Street Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	0	$0
	2. Crossing Approaches	SY	$75	0	$0
	4. Crossing Signals				
IV.	RR SIGNALS				
	a. Per P.O. T.O.	Each	$250,000	4	$1,000,000
	b. Per Mile	Mile	$750,000	0	$0
V.	UTILITY RELOCATION/ADJUSTMENT				
VI.	CONTINGENCIES (30%)	LS		30%	$550,800
				CONSTRUCTION TOTAL	$2,386,800
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		20%	$477,360
				CONSTRUCTION & MITIGATION SUBTOTAL	$2,864,160
VIII.	ENGINEERING/ADMINISTRATION (7%)	LS		7%	$167,076
IX.	CONSTRUCTION MANAGEMENT (6%)	LS		6%	$143,208
X.	RIGHT OF WAY	ACRE	$250,000	0	$0
XI.	TAX (8.2%)			8.2%	$195,718
				TOTAL	$3,370,162

King Street Station

	UNITS	UNIT COST	QUANTITY	TOTAL
Conceptual development continuing; most effective alternative not established. Estimate based on approximation of likely cost of the alternatives. Increase the number of through station tracks from three to a minimum of five including associated power switches at both ends of the station.	LS	$80,000,000	$1	$80,000,000

Seattle Maintenance Facility

	UNITS	UNIT COST	QUANTITY	TOTAL
The Seattle Maintenance Faility is a joint WSDOT / Amtrak project. Design is partially complete; however, the timing of the requested closure of the Holgate Street crossing in the middle of the proposed facility may have a significant effect on the specific arrangement of the failcity and the final cost. New storage tracks, train washer, inspection building for arriving trains, locomotive and car maintenance shop and administrative office.	LS	$95,000,000	1	$95,000,000

China Creek Crossover

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	2600	$52,000
2. Excavation	CY	$10	2600	$26,000
3. Rock Excavation	CY	$50	0	$0
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	0	$0
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
e. #24's	Each	$340,000	1	$340,000
4. Bridges				
a.	TF	$8,000	0	$0
5. Culvert Crossings				
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 58.01 Main Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	0	$0
2. Crossing Approaches	SY	$75	0	$0
4. Crossing Signals				
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	2	$500,000
b. Per Mile	Mile	$750,000	0	$0
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		30%	$275,400
			CONSTRUCTION TOTAL	$1,193,400
VII. ENVIRONMENTAL MITIGATION (20%)	LS		20%	$238,680
			CONSTRUCTION & MITIGATION SUBTOTAL	$1,432,080
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		7%	$83,538
IX. CONSTRUCTION MANAGEMENT (6%)	LS		6%	$71,604
X. RIGHT OF WAY	ACRE	$250,000	0%	$0
XI. TAX (8.2%)			8%	$97,859
			TOTAL	$1,685,081

Auburn South Third Main Track

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	299376	$4,490,640
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	42768	$5,773,680
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
e. #24's	Each	$170,000	1	$170,000
f. #33's	Each	$360,000	6	$2,160,000
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
e. #24's	Each	$340,000	1	$340,000
f. #33's	Each	$720,000	0	$0
4. Bridges				
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	0	$0
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
3. Grade-Separation Crossing				
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	5	$1,000,000
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	11	$2,750,000
b. Per Mile	Mile	$750,000	8.1	$6,075,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		30%	$6,827,796
			CONSTRUCTION TOTAL	$29,587,116
VII. ENVIRONMENTAL MITIGATION (20%)	LS		20%	$5,917,423
			CONSTRUCTION & MITIGATION SUBTOTAL	$35,504,539
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		7%	$2,071,098
IX. CONSTRUCTION MANAGEMENT (6%)	LS		6%	$1,775,227
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			8.2%	$2,426,144
			TOTAL	$41,777,008

Assumptions:	***Track Miles***	
1 New Track from MP 20.9 to MP 24.2	*3.3*	*$ 12,659,699 / mile*
New Yard Tracks	*4.8*	
	8.1	

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Sound Transit Phase 3

	UNITS	UNIT COST	QUANTITY	TOTAL
Estimate and description furnished by BNSF includes the following components: Relocate main tra cks east of all freight trackage. Changes to Tukwila, Black River, and Argo interlockings for through movement via BNSF route on all main tracks. Third main track between MP 21 and MP 18.6.	LS	$139,000,000	$1	$139,000,000

Winlock to Chehalis Third Main Track

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	20000	$1,000,000
*4. General**	CY	$15	462369.6	$6,935,544
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	66052.8	$8,917,128
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	2	$720,000
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. MP 70.45 182' Deck Plate Girder	TF	$8,000	182	$1,456,000
b. 1500' Flyover	TF	$8,000	1500	$12,000,000
c. 10' Concrete Arch	TF	$8,000	10	$80,000
d. 10' Concrete Arch	TF	$8,000	10	$80,000
e. 10' Concrete Arch	TF	$8,000	10	$80,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	60	$36,000
b. Minor Culverts (<36" Diameter)	LF	$100	2000	$200,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 71.44 Walnut Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
b. MP 71.29 Fir Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
c. MP 70.45 STP GR Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
d. MP 69.74 Hawkins Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
e. MP 69.24 Private Road Crossing				
Close Crossing	LS	$5,000	1	$5,000
f. MP 68.80 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
g. MP 68.19 Amtrim Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250

	h. Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
	2. Crossing Approaches	SY	$75	175	$13,125
	i. Jordan Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	j. Koontz Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	k. Harmon Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	l. Rogers Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	3. Grade-Separation Crossing				
	a. Bridge	SF	$100	0	$0
	b. Roadway (earthwork & paving)	SY	$50	0	$0
	c. Misc. (non-typical per project)	LS	$1	0	$0
	4. Crossing Signals				
	a. Upgrade Signal - Barrier Gates	Each	$200,000	7	$1,400,000
	b. New Signal	Each	$250,000	5	$1,250,000
IV.	RR SIGNALS				
	a. Per P.O. T.O.	Each	$250,000	3	$750,000
	b. Per Mile	Mile	$750,000	12.51	$9,382,500
V.	UTILITY RELOCATION/ADJUSTMENT				
	1. Transmission Lines	LS	$1	0	$0
	2. Fiber Optic Lines	LF	$95	0	$0
	3. Miscellaneous	LS	$1,000,000	0	$0
VI.	CONTINGENCIES (30%)	LS		30%	$13,456,402
				CONSTRUCTION TOTAL	$58,311,074
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		20%	$11,662,215
			CONSTRUCTION & MITIGATION SUBTOTAL		$69,973,288
VIII.	ENGINEERING/ADMINISTRATION (7%)	LS		7%	$4,081,775
IX.	CONSTRUCTION MANAGEMENT (6%)	LS		6%	$3,498,664
X.	RIGHT OF WAY	ACRE	$250,000	51.12	$12,780,000
XI.	TAX (8.2%)			8.2%	$4,781,508
				TOTAL	$95,115,236

Assumptions: ***Track Miles***

1 New Track from MP 72.00 to 59.49 *12.51* *$ 7,603,136 / mile*

**Private Crossings are to be closed or equiped with auto gates.*

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the tin*

Chehalis Siding

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	55440	$831,600
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	7920	$1,069,200
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	2	$270,000
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
4. Bridges				
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	30	$3,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 58.01 Main Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
b. MP 57.93 Center Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
c. MP 57.88 Prindle Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
d. MP 57.65 West Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	4	$800,000
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	2	$500,000
b. Per Mile	Mile	$750,000	1.5	$1,125,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		30%	$1,447,140
			CONSTRUCTION TOTAL	$6,270,940
VII. ENVIRONMENTAL MITIGATION (20%)	LS		20%	$1,254,188
			CONSTRUCTION & MITIGATION SUBTOTAL	$7,525,128
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		7%	$438,966
IX. CONSTRUCTION MANAGEMENT (6%)	LS		6%	$376,256
X. RIGHT OF WAY	ACRE	$250,000	0%	$0
XI. TAX (8.2%)			8%	$514,217
			TOTAL	$8,854,567

Assumptions: ***Track Miles***

Chehalis Siding MP 57-58.3 *1.5* *$ 5,903,045 / mile*

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Chehalis Crossovers

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	5200	$104,000
2. Excavation	CY	$10	5200	$52,000
3. Rock Excavation	CY	$50	0	$0
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	0	$0
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
aa. Remove turnout	EA	$10,000	4	$40,000
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
e. #24's	Each	$340,000	2	$680,000
4. Bridges				
a.	TF	$8,000	0	$0
5. Culvert Crossings				
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 58.01 Main Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	0	$0
2. Crossing Approaches	SY	$75	0	$0
4. Crossing Signals				
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	4	$1,000,000
b. Per Mile	Mile	$750,000	0	$0
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		30%	$562,800
			CONSTRUCTION TOTAL	$2,438,800
VII. ENVIRONMENTAL MITIGATION (20%)	LS		20%	$487,760
			CONSTRUCTION & MITIGATION SUBTOTAL	$2,926,560
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		7%	$170,716
IX. CONSTRUCTION MANAGEMENT (6%)	LS		6%	$146,328
X. RIGHT OF WAY	ACRE	$250,000	0%	$0
XI. TAX (8.2%)			8%	$199,982
			TOTAL	$3,443,586

East St. Johns Siding and Main Track Relocation

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	96096	$1,441,440
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	13728	$1,853,280
b. Rehab Track	TF	$60	10032	$601,920
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	4	$440,000
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	1	$160,000
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	3	$660,000
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	1	$320,000
e. #24's	Each	$340,000	2	$680,000
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. MP 5.74 113' Deck Plate Girder	TF	$8,000	226	$1,808,000
b. MP 5.80 337' Steel Bridge	TF	$8,000	674	$5,392,000
c. MP 6.12 337' Steel Bridge	TF	$8,000	674	$5,392,000
d. MP 6.69 157' Steel Bridge	TF	$8,000	157	$1,256,000
e. MP 7.43 306' Thru Pin Connected Truss	TF	$8,000	306	$2,448,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	0	$0
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
3. Grade-Separation Crossing				
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	0	$0
b. New Signal	Each	$250,000	0	$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	8	$2,000,000
b. Per Mile	Mile	$750,000	4.5	$3,375,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		0.3	$8,348,292
			CONSTRUCTION TOTAL	$36,175,932
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0.2	$7,235,186
			CONSTRUCTION & MITIGATION SUBTOTAL	$43,411,118
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0.07	$2,532,315
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0.06	$2,170,556
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			0.082	$2,966,426
			TOTAL	$51,080,416

Assumptions: ***Track Miles***

4.5 *$ 11,351,204 / mile*

East St. Johns: 2.6 Miles of New Track, 1.9 Miles of Upgraded Track, 8 New No. 20 T.O's, 4 New No. 20 X-Overs

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Lake Yard North Leads

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	85008	$1,275,120
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	12144	$1,639,440
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	4	$440,000
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	1	$160,000
e. #24's	Each	$170,000	1	$170,000
f. #33's	Each	$360,000	0	$0
g. Remove Turnout	Each	$11,025	15	$165,375
3. Crossovers				
b. #11's	Each	$220,000	4	$880,000
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	2	$640,000
e. #24's	Each	$340,000	0	$0
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. MP 5.74 113' Deck Plate Girder	TF	$8,000	0	$0
b. MP 5.80 337' Steel Bridge	TF	$8,000	0	$0
c. MP 6.12 337' Steel Bridge	TF	$8,000	0	$0
d. MP 6.69 157' Steel Bridge	TF	$8,000	0	$0
e. MP 7.43 306' Thru Pin Connected Truss	TF	$8,000	0	$0
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	0	$0
b. Minor Culverts (<36" Diameter)	LF	$100	0	$0
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
3. Grade-Separation Crossing				
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	1	$200,000
b. New Signal	Each	$250,000		$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	11	$2,750,000
b. Per Mile	Mile	$750,000	2.3	$1,725,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		0.3	$3,013,481
			CONSTRUCTION TOTAL	$13,058,416
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0.2	$2,611,683
		CONSTRUCTION & MITIGATION SUBTOTAL		$15,670,099
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0.07	$914,089
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0.06	$783,505
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			0.082	$1,070,790
			TOTAL	$18,438,483

Assumptions: ***Track Miles***

2.3 *$ 8,016,732 / mile*

Lake Yard to Willbridge: 2.3 Miles of New Track, 5 #20 T.O's and Balboa Grade Crossing

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Portland Union Station

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	19467	$292,005
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	2781	$375,435
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	2	$220,000
c. #15's	Each	$120,000	0	$0
d. #20's	Each	$160,000	0	$0
f. #33's	Each	$360,000	0	$0
3. Crossovers				
b. #11's	Each	$220,000	1	$220,000
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
e. #24's	Each	$340,000	0	$0
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. MP 5.74 113' Deck Plate Girder	TF	$8,000	0	$0
b. MP 5.80 337' Steel Bridge	TF	$8,000	0	$0
c. MP 6.12 337' Steel Bridge	TF	$8,000	0	$0
d. MP 6.69 157' Steel Bridge	TF	$8,000	0	$0
e. MP 7.43 306' Thru Pin Connected Truss	TF	$8,000	0	$0
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600		$0
b. Minor Culverts (<36" Diameter)	LF	$100	0	$0
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 4.20 Balboa Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	0	$0
2. Crossing Approaches	SY	$75		$0
3. Grade-Separation Crossing				
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	0	$0
b. New Signal	Each	$250,000		$0
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	4	$1,000,000
b. Per Mile	Mile	$750,000	1.6	$1,200,000
V. UTILITY RELOCATION/ADJUSTMENT				
VI. CONTINGENCIES (30%)	LS		0.3	$992,232
			CONSTRUCTION TOTAL	$4,299,672
VII. ENVIRONMENTAL MITIGATION (20%)	LS		0.2	$859,934
		CONSTRUCTION & MITIGATION SUBTOTAL		$5,159,606
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0.07	$300,977
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0.06	$257,980
X. RIGHT OF WAY	ACRE	$250,000	0	$0
XI. TAX (8.2%)			0.082	$352,573
			TOTAL	$6,071,137

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Advanced Signal System (Portland - Seattle)

	UNITS	UNIT COST	QUANTITY	TOTAL
Advanced signal system for high speed track between Portland and Seattle	LS	$268,000,000	1	$268,000,000

An Advanced Signal System that provides at least cab signal indications, and as much as enforcement of compliance with cab signal indications is required by federal regulation for a speed of more than seventy-nine mph. Several systems are being developed that include elements of positive train separation or positive train control systems, which not only provide cab signal indications but also will control a train to prevent overrunning speed restrictions or movement authority. None of the systems being developed are ready for evaluation for use on the PNWRC.

Chehalis to Hannaford Third Main Track

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	299376	$4,490,640
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	42768	$5,773,680
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
e. #24's	Each	$170,000	1	$170,000
f. #33's	Each	$360,000	1	$360,000
6. Remove Turnout	Each	$11,025	4	$44,100
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	2	$540,000
d. #20's	Each	$320,000	1	$320,000
e. #24's	Each	$340,000	6	$2,040,000
f. #33's	Each	$720,000	0	$0
4. Bridges				
a. MP 59.49 206' Thru Deck Girder Bridge	TF	$8,000	206	$1,648,000
b. MP 58.65 222' Wood Pile Trestle Bridge	TF	$8,000	222	$1,776,000
c. MP 55.86 121' Wide Flange Beam Span	TF	$8,000	121	$968,000
d. MP 53.87 Bridge	TF	$8,000	0	$0
d. MP 51.87 204' Wide Flange Beam Span Bridge	TF	$8,000	204	$1,632,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	2	$1,200
b. Minor Culverts (<36" Diameter)	LF	$100	360	$36,000
6. Other Drainage	LS	$0	0	$0
7. Station Platform (25x1000', grade separate pedestrian crossing)	LS	$2,000,000	1	$2,000,000
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 58.01 Main Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
b. MP 57.93 Center Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
c. MP 57.88 Prindle Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
d. MP 57.65 West Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
e. MP 55.18 Floral Avenue Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
f. MP 54.82 W. Summa Street Grade Crossing				

	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	g. MP 54.54 Chestnut Street Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	h. MP 54.37 Plum Street Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	i. MP 54.17 Locust Street Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	j. MP 54.10 Main Street Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	k. MP 53.90 Maple Street Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	l. MP 53.44 3rd Street Pedestrian Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	10	$5,000
	2. Crossing Approaches	SY	$75	0	$0
	3. Grade-Separation Crossing				
	a. Bridge	SF	$100	0	$0
	b. Roadway (earthwork & paving)	SY	$50	0	$0
	c. Misc. (non-typical per project)	LS	$1	0	$0
	4. Crossing Signals				
	a. Upgrade Signal - Barrier Gates	Each	$200,000	11.5	$2,300,000
	b. New Signal	Each	$250,000	0	$0
IV.	RR SIGNALS				
	a. Per P.O. T.O.	Each	$250,000	22.5	$5,625,000
	b. Per Mile	Mile	$750,000	8.1	$6,075,000
V.	UTILITY RELOCATION/ADJUSTMENT				
	1. Transmission Lines	LS	$1	0	$0
	2. Fiber Optic Lines	LF	$95	0	$0
	3. Miscellaneous	LS	$1,000,000	0	$0
VI.	CONTINGENCIES (30%)	LS		0.3	$10,927,011
				CONSTRUCTION TOTAL	$47,350,381
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		0.2	$9,470,076
				CONSTRUCTION & MITIGATION SUBTOTAL	$56,820,457
VIII.	ENGINEERING/ADMINISTRATION (7%)	LS		0.07	$3,314,527
IX.	CONSTRUCTION MANAGEMENT (6%)	LS		0.06	$2,841,023
X.	RIGHT OF WAY	ACRE	$250,000	0.61	$152,500
XI.	TAX (8.2%)			0.082	$3,882,731
				TOTAL	$67,011,238

Assumptions: ***Track Miles***

1 New Track from MP 59.49 to 51.39 *8.1* *$ 8,272,992 / mile*

8.10

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Ostrander to Winlock Third and Fourth Main Track

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	1272533	$19,087,992
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	181790	$24,541,704
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
e. #24's	Each	$170,000	0	$0
f. #33's	Each	$360,000	3	$1,080,000
g. #48's	Each	$500,000	1	$500,000
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
e. #24's	Each	$340,000	1	$340,000
f. #33's	Each	$720,000	2	$1,440,000
4. Bridges				
a. MP 93.98 4' Concrete Arch	TF	$8,000	4	$32,000
b. MP 93.62 Girder Span Bridge	TF	$8,000	0	$0
c. MP 93.49 Concrete Box Girder	TF	$8,000	0	$0
d. MP 93.24 70' Ballast Deck Pile Wd Trestle (2 tracks)	TF	$8,000	140	$1,120,000
e. MP 93.05 42' Ballast Deck Pile Wd Trestle (2 tracks)	TF	$8,000	84	$672,000
f. MP 91.75 43' Wide Flange Beam Span (2 tracks)	TF	$8,000	86	$688,000
g. MP 90.00 5' Concrete Arch (2 tracks)	TF	$8,000	10	$80,000
h. MP 89.08 56' Wood Pile Trestle (2 tracks)	TF	$8,000	112	$896,000
i. MP 89.06 10' Concrete Arch (2 tracks)	TF	$8,000	20	$160,000
j. MP 88.42 10' Concrete Arch (2 tracks)	TF	$8,000	20	$160,000
k. MP 88.06 10' Concrete Arch (2 tracks)	TF	$8,000	20	$160,000
l. MP 86.64 7' Concrete Arch (2 tracks)	TF	$8,000	14	$112,000
m. MP 86.35 67' Wide Flange Beam Span (2 tracks)	TF	$8,000	134	$1,072,000
n. MP 84.88 346' Thru Plate Girder (2 tracks)	TF	$8,000	692	$5,536,000
o. MP 83.48 7' Concrete Arch (2 tracks)	TF	$8,000	14	$112,000
p. MP 83.04 7' Concrete Arch (2 tracks)	TF	$8,000	14	$112,000
q. MP 81.50 662' Deck Plate Girder	TF	$8,000	662	$5,296,000
r. MP 80.75 5' Concrete Arch	TF	$8,000	5	$40,000
s. MP 78.78 6' Concrete Arch	TF	$8,000	6	$48,000
t. MP 78.39 237' Deck Plate Girder	TF	$8,000	237	$1,896,000
u. MP 76.XX 7' Concrete Arch	TF	$8,000	7	$56,000
v. MP 73.92 8' Concrete Arch	TF	$8,000	8	$64,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	180	$108,000
b. Minor Culverts (<36" Diameter)	LF	$100	2790	$279,000
6. Other Drainage	LS	$0	0	$0

III. ROADWAY					
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 92.29 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
c. MP 90.23 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
d. MP 87.43 Cowlitz Ave. Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	120	$60,000
2. Crossing Approaches	SY	$75	700	$52,500
e. MP 83.80 Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
f. MP 82.85 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
g. MP 82.72 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
h. MP 81.29 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
i. MP 80.45 Agren Road Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
j. MP 77.83 7th St./SR 506 Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	80	$40,000
2. Crossing Approaches	SY	$75	400	$30,000
k. MP 76.95 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
l. MP 74.66 Ferrier St. Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
m. MP 74.01 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
n. MP 73.48 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
o. MP 72.10 Campbell St. Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
p. MP 71.44 Walnut St./SR 603 Grade X-ing				
1. Concrete Crossing Panels Installed	TF	$500	80	$40,000
2. Crossing Approaches	SY	$75	400	$30,000
3. Grade-Separation Crossing				
a. Bridge	SF	$100	0	$0
b. Roadway (earthwork & paving)	SY	$50	0	$0
c. Misc. (non-typical per project)	LS	$1	0	$0
4. Crossing Signals				
a. Upgrade Signal - Barrier Gates	Each	$200,000	10	$2,000,000
b. New Signal	Each	$250,000	12	$3,000,000
IV. RR SIGNALS				
a. Per P.O. T.O.	Each	$250,000	13	$3,250,000

	b. Per Mile	Mile	$750,000	34.43	$25,822,500
V.	UTILITY RELOCATION/ADJUSTMENT				
	1. Transmission Lines	LS	$1	0	$0
	2. Fiber Optic Lines	LF	$95	0	$0
	3. Miscellaneous	LS	$1,000,000	0	$0
VI.	CONTINGENCIES (30%)	LS		0.3	$30,155,984
				CONSTRUCTION TOTAL	$130,675,930
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		0.2	$26,135,186
				CONSTRUCTION & MITIGATION SUBTOTAL	$156,811,116
VIII.	ENGINEERING/ADMINISTRATION (7%)	LS		0.07	$9,147,315
IX.	CONSTRUCTION MANAGEMENT (6%)	LS		0.06	$7,840,556
X.	RIGHT OF WAY	ACRE	$250,000	28.36	$7,090,000
XI.	TAX (8.2%)			0.082	$10,715,426
				TOTAL	$191,604,413

Assumptions:	***Track Miles***		
1 New Track from MP 95.03 to 93.4	*1.63*		
2 New Tracks from MP 93.4 to 82	*22.8*		
1 New Track from MP 82 to 72	*10*		
	34.43	*$5,565,042*	*/ Mile*

**Private Crossings are to be closed or equiped with auto gates.*

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Felida to MP 114 Third Main Track

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	674520	$10,117,800
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	96360	$13,008,600
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
e. #24's	Each	$170,000	1	$170,000
f. #33's	Each	$360,000	1	$360,000
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	2	$640,000
e. #24's	Each	$340,000	0	$0
f. #33's	Each	$720,000	1	$720,000
4. Bridges				
a. MP 128.6 135' Deck Plate Girder	TF	$8,000	135	$1,080,000
b. MP 128.38 Concrete Arch 12'	TF	$8,000	12	$96,000
c. MP 127.09 Concrete Arch 8'	TF	$8,000	8	$64,000
d. MP 125.88 48' Reinforced Conc. Trestle	TF	$8,000	48	$384,000
e. MP 124.46 124' Deck Plate Girder	TF	$8,000	124	$992,000
f. MP 121.66 Concrete Arch 10'	TF	$8,000	10	$80,000
g. MP 119.17 808' Thru Riveted Truss	TF	$8,000	808	$6,464,000
h. MP 114.88 52' Deck Plate Girder	TF	$8,000	52	$416,000
i. MP 114.81 51' Deck Plate Girder	TF	$8,000	51	$408,000
j. MP 114.41 Concrete Arch 8'	TF	$8,000	8	$64,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	60	$36,000
b. Minor Culverts (<36" Diameter)	LF	$100	3420	$342,000
6. Other Drainage	LS	$0	0	$0
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				
a. MP 130.45 122nd Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
b. MP 129.70 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
c. MP 128.18 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
d. MP 125.50 Private Road Crossing				
1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
2. Crossing Approaches	SY	$75	175	$13,125
e. MP 123.32 Wildlife Refuge Rd. Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
f. MP 122.53 Mill Street Grade Crossing				
1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
2. Crossing Approaches	SY	$75	350	$26,250
g. MP 122.39 Division St. Grade Crossing				

	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	h. MP 121.47 Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
	2. Crossing Approaches	SY	$75	175	$13,125
	i. MP 119.38 Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
	2. Crossing Approaches	SY	$75	175	$13,125
	j. MP 117.50 Whalen Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	k. MP 116.63 Davidson Ave. Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	l. MP 115.76 Scott Avenue Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	3. Grade-Separation Crossing				
	a. Bridge	SF	$100	0	$0
	b. Roadway (earthwork & paving)	SY	$50	0	$0
	c. Misc. (non-typical per project)	LS	$1	0	$0
	4. Crossing Signals				
	a. Upgrade Signal - Barrier Gates	Each	$200,000	7	$1,400,000
	b. New Signal	Each	$250,000	5	$1,250,000
IV.	RR SIGNALS				
	a. Per P.O. T.O.	Each	$250,000	9.5	$2,375,000
	b. Per Mile	Mile	$750,000	18.25	$13,687,500
V.	UTILITY RELOCATION/ADJUSTMENT				
	1. Transmission Lines	LS	$1	0	$0
	2. Fiber Optic Lines	LF	$95	0	$0
	3. Miscellaneous	LS	$1,000,000	0	$0
VI.	CONTINGENCIES (30%)	LS		0.3	$16,406,783
				CONSTRUCTION TOTAL	$71,096,058
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		0.2	$14,219,212
				CONSTRUCTION & MITIGATION SUBTOTAL	$85,315,269
VIII.	ENGINEERING/ADMINISTRATION (7%)	LS		0.07	$4,976,724
IX.	CONSTRUCTION MANAGEMENT (6%)	LS		0.06	$4,265,763
X.	RIGHT OF WAY	ACRE	$250,000	14.9	$3,725,000
XI.	TAX (8.2%)			0.082	$5,829,877
				TOTAL	$104,112,633

Assumptions: ***Track Miles***

1 New Track from MP 130.45 to 112.20 *18.25* *$ 5,704,802 / mile*

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*
**Private Crossings are to be closed or equiped with auto gates.*

Hannaford to Nisqually Third and Fourth Main Track

	UNITS	UNIT COST	QUANTITY	TOTAL
I. EARTHWORK				
1. Embankment	CY	$20	0	$0
2. Excavation	CY	$10	0	$0
3. Rock Excavation	CY	$50	0	$0
*4. General**	CY	$15	1683898	$25,258,464
II. TRACK				
1. Track Construction				
a. New Track	TF	$135	240557	$32,475,168
b. Rehab Track	TF	$60	0	$0
2. Turnouts				
a. #9's	Each	$100,000	0	$0
b. #11's	Each	$110,000	0	$0
c. #15's	Each	$135,000	0	$0
d. #20's	Each	$160,000	0	$0
e. #24's	Each	$170,000	3	$510,000
f. #33's	Each	$360,000	1	$360,000
g. #48's	Each	$500,000	1	$500,000
3. Crossovers				
b. #11's	Each	$220,000	0	$0
c. #15's	Each	$270,000	0	$0
d. #20's	Each	$320,000	0	$0
e. #24's	Each	$340,000	2	$680,000
f. #33's	Each	$720,000	1	$720,000
4. Bridges				
a. MP 47.38 144' Deck Truss Span (2 tracks)	TF	$8,000	288	$2,304,000
b. MP 45.63 48' Reinforced Concrete Trestle (2 tracks)	TF	$8,000	96	$768,000
c. MP 43.09 130' Deck Plate Girder (2 tracks)	TF	$8,000	260	$2,080,000
d. MP 42.77 130' Deck Plate Girder (2 tracks)	TF	$8,000	260	$2,080,000
e. MP 42.65 10' Concrete Arch (2 tracks)	TF	$8,000	20	$160,000
f. MP 40.27 8' Concrete Arch (2 tracks)	TF	$8,000	16	$128,000
g. MP 40.17 105' Wood Pile Trestle (2 tracks)	TF	$8,000	210	$1,680,000
h. MP 39.57 42' Girder Beam Span (2 tracks)	TF	$8,000	84	$672,000
h. MP 39.14 71' Reinforced Concrete Trestle (2 tracks)	TF	$8,000	142	$1,136,000
i. MP 37.99 145' Concrete Bridge (2 tracks)	TF	$8,000	290	$2,320,000
j. MP 36.15 220' Deck Riveted Truss	TF	$8,000	220	$1,760,000
k. MP 33.56 74' Wood BDPT	TF	$8,000	74	$592,000
l. MP 31.60 112' Concrete Box Girder	TF	$8,000	112	$896,000
m. MP 30.75 248' Wide Flange Beam Span	TF	$8,000	248	$1,984,000
n. MP 26.84 305' Concrete	TF	$8,000	305	$2,440,000
o. Remove Existing Bridge Sta 1340 (Existing Nisqually River Bridge, double track)	TF	$3,000	700	$2,100,000
p. Construct New Bridge at Sta 635+00 (Nisqually River, 300', Truss Triple Track)	TF	$15,000	900	$13,500,000
q. Construct New Bridge at Sta 635+00 (Nisq River, 1800' Deck Plate Girder, Triple Track)	TF	$8,000	5400	$43,200,000
5. Culvert Crossings				
a. Major Culverts (>36" Diameter)	LF	$600	90	$54,000
b. Minor Culverts (<36" Diameter)	LF	$100	1860	$186,000
6. Other Drainage	LS	$0	0	$0
7. Retaining Walls	LF	$1,000	1000	$1,000,000
III. ROADWAY				
1. Roadway Construction	SY	$60	0	$0
2. At-Grade Crossing				

	a. MP 51.39 Hanaford Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	120	$60,000
	2. Crossing Approaches	SY	$75	700	$52,500
	b. MP 49.17 Connor Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	120	$60,000
	2. Crossing Approaches	SY	$75	700	$52,500
	c. MP 48.47 Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	d. MP 46.82 7th St. Ped Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	20	$10,000
	2. Crossing Approaches	SY	$75	0	$0
	e. MP 45.30 184th St. S.E. Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	120	$60,000
	2. Crossing Approaches	SY	$75	700	$52,500
	f. MP 42.43 Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	g. MP 41.10 McDuff Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	120	$60,000
	2. Crossing Approaches	SY	$75	700	$52,500
	h. MP 37.02 Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	i. MP 36.55 South Rich Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	120	$60,000
	2. Crossing Approaches	SY	$75	700	$52,500
	j. MP 36.01 Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
	2. Crossing Approaches	SY	$75	175	$13,125
	k. MP 34.84 North Rich Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	l. MP 31.42 Atchison Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	m. MP 29.94 Marvin Road Grade Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	60	$30,000
	2. Crossing Approaches	SY	$75	350	$26,250
	n. MP 27.65 Private Road Crossing				
	1. Concrete Crossing Panels Installed	TF	$500	30	$15,000
	2. Crossing Approaches	SY	$75	175	$13,125
	3. Grade-Separation Crossing				
	a. Bridge	SF	$100	0	$0
	b. Roadway (earthwork & paving)	SY	$50	0	$0
	c. Misc. (non-typical per project)	LS	$1	0	$0
	4. Crossing Signals				
	a. Upgrade Signal - Barrier Gates	Each	$200,000	14	$2,800,000
	b. New Signal	Each	$250,000	8	$2,000,000
IV.	RR SIGNALS				
	a. Per P.O. T.O.	Each	$250,000	12	$3,000,000
	b. Per Mile	Mile	$750,000	45.56	$34,170,000
V.	UTILITY RELOCATION/ADJUSTMENT				
	1. Transmission Lines	LS	$1	0	$0
	2. Fiber Optic Lines	LF	$95	0	$0
	3. Miscellaneous	LS	$1,000,000	0	$0
VI.	CONTINGENCIES (30%)	LS		30%	$55,343,965
				CONSTRUCTION TOTAL	$239,823,847
VII.	ENVIRONMENTAL MITIGATION (20%)	LS		0.2	$47,964,769

	CONSTRUCTION & MITIGATION SUBTOTAL			$287,788,616
VIII. ENGINEERING/ADMINISTRATION (7%)	LS		0.07	$16,787,669
IX. CONSTRUCTION MANAGEMENT (6%)	LS		0.06	$14,389,431
X. RIGHT OF WAY				
a. Undeveloped	ACRE	$250,000	12.42	$3,105,000
b. Residential	ACRE	$350,000	25	$8,750,000
XI. TAX (8.2%)			8.2%	$23,598,667
			TOTAL	$354,419,382

Assumptions:	***Track Miles***	
2 New Tracks from MP 51.39 to 36.15	*30.48*	*$ 11,627,932 / mile*
1 New Track from MP 36.15 to MP 26.16	*9.99*	
2 New Track from MP 26.16 to MP 25.04	*2.24*	
3 New Track from MP 25.04 to MP 24.09 (Nisqually)	*2.85*	
	45.56	

**Private Crossings are to be closed or equiped with auto gates.*

**General Excavation Includes a fill section of 5' x 25' for 75% of the time and a cut section of 10' x 25' for 25% of the time*

Columbia River Bridge

	UNITS	UNIT COST	QUANTITY	TOTAL
The information needed to make a more detailed conceptual estimate requires extensive engineering. No design work has been conducted. The estimate is based on the expected magnitude compared to other similar projects. Expected components of the project include: New single track bridge including vertical lift span, approximately 2,800 feet Replace swing span of existing bridge with vertical lift span Turnout and crossovers at the north end of the Oregon Slough Bridge new arrangement of turnouts at the north end of the Columbia River Bridge	LS	$500,000,000	1	$500,000,000

Appendix B: List of Common Cost Estimate Abbreviations and Acronyms

Appendix B:
List of Common Cost Estimate Abbreviations and Acronyms

BDPT	Ballast Deck Pile Trestle - Wood
BNSF	BNSF Railway Company
CBG	Concrete Box Girder
CIP	Cast Iron Pipe
CTC	Centralized Traffic Control
CTG	Concrete "T" Girder
CY	Cubic Yards
DPG	Deck Plate Girder
DPGOD	Deck Plate Girder – Open Deck
EA	Each
LF	Linear Foot
LS	Lump Sum
MI	Miles
MP	Mile Post (Rail)
No.	Number
P.O.T.O.	Power Operated Turnout
PT	Pile Trestle - Wood
RBM	Rail Bound Manganese Frog Turnout
RCT	Reinforced Concrete Trestle
RR	Railroad
SF	Square Feet
SPR	Spring Frog Turnout
Sta	Station
SY	Square Yards
TF	Track Feet
T.O.	Turnout
TRT	Thru Riveted Truss
TSTOD	Thru Steel Truss – Open Deck

This page intentionally left blank.

Appendix C:
Inflation-Adjusted Costs Based on Proposed Construction Year

Appendix C
Capital Costs Based on Proposed Year of Construction

Seattle to Portland, OR

Project/Land	Base Year $	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
2005 (Timetable A)											
Felida Crossover	**$2,200,000**	2266000	$ 2,333,980.00								
Woodland Crossover	**$2,800,000**	2884000	$ 2,970,520.00								
Titlow Crossover	**$4,000,000**	4120000	$ 4,243,600.00								
Ruston Crossover	**$3,500,000**	3605000	$ 3,713,150.00								
Sound Transit	**$264,000,000**	271920000	$ 280,077,600.00								
2007 (Timetable B)											
Vancouver Rail Project	**$76,797,731**	$ 79,101,662.85	$ 81,474,712.74	$ 83,918,954.12	$ 86,436,522.74						
Kelso-Martin's Bluff Rail Project	**$394,906,903**	$ 406,754,110.09	$ 418,956,733.39	$ 431,525,435.39	$ 444,471,198.46						
Centennial Crossovers	**$3,443,586**	$ 3,546,893.58	$ 3,653,300.39	$ 3,762,899.40	$ 3,875,786.38						
Winlock Crossover	**$3,370,162**	$ 3,471,266.86	$ 3,575,404.87	$ 3,682,667.01	$ 3,793,147.02						
Ketron Crossover	**$3,370,162**	$ 3,471,266.86	$ 3,575,404.87	$ 3,682,667.01	$ 3,793,147.02						
Tenino Crossover	**$3,370,162**	$ 3,471,266.86	$ 3,575,404.87	$ 3,682,667.01	$ 3,793,147.02						
North Portland Junction to Kenton	**$50,965,599**	$ 52,494,566.97	$ 54,069,403.98	$ 55,691,486.10	$ 57,362,230.68						
2009 (Timetable C)											
Pt. Defiance Bypass	**$310,563,418**	$ 319,880,320.54	$ 329,476,730.16	$ 339,361,032.06	$ 349,541,863.02	$ 360,028,118.91	$ 370,828,962.48				
Reservation Third Main	**$66,560,943**	$ 68,557,771.29	$ 70,614,504.43	$ 72,732,939.56	$ 74,914,927.75	$ 77,162,375.58	$ 79,477,246.85				
Centralia Steam Plant	**$16,618,201**	$ 17,116,747.03	$ 17,630,249.44	$ 18,159,156.92	$ 18,703,931.63	$ 19,265,049.58	$ 19,843,001.07				
Woodland Siding	**$16,308,480**	$ 16,797,734.40	$ 17,301,666.43	$ 17,820,716.42	$ 18,355,337.92	$ 18,905,998.06	$ 19,473,178.00				
Newaukum Crossover	**$3,370,162**	$ 3,471,266.45	$ 3,575,404.44	$ 3,682,666.57	$ 3,793,146.57	$ 3,906,940.97	$ 4,024,149.20				
Seattle Maintenance Facility	**$95,000,000**	$ 97,850,000.00	$ 100,785,500.00	$ 103,809,065.00	$ 106,923,336.95	$ 110,131,037.06	$ 113,434,968.17				
Chehalis Jct. Crossover	**$3,443,586**	$ 3,546,893.17	$ 3,653,299.96	$ 3,762,898.96	$ 3,875,785.93	$ 3,992,059.51	$ 4,111,821.29				
China Creek Crossover	**$1,685,081**	$ 1,735,633.43	$ 1,787,702.43	$ 1,841,333.51	$ 1,896,573.51	$ 1,953,470.72	$ 2,012,074.84				
King Street Station	**$80,000,000**	$ 82,400,000.00	$ 84,872,000.00	$ 87,418,160.00	$ 90,040,704.80	$ 92,741,925.94	$ 95,524,183.72				
Sound Transit	**$139,000,000**	$ 143,170,000.00	$ 147,465,100.00	$ 151,889,053.00	$ 156,445,724.59	$ 161,139,096.33	$ 165,973,269.22				
Auburn South Third Main	**$41,777,008**	$ 43,030,318.24	$ 44,321,227.79	$ 45,650,864.62	$ 47,020,390.56	$ 48,431,002.28	$ 49,883,932.34				
2015 (Timetable D)											
Winlock to Chehalis Third Main	**$95,115,236**	$ 97,968,693.08	$ 100,907,753.87	$ 103,934,986.49	$ 107,053,036.08	$ 110,264,627.17	$ 113,572,565.98	$ 116,979,742.96	$ 120,489,135.25	$ 124,103,809.31	$ 127,826,923.59
Chehalis Siding	**$8,854,567**	$ 9,120,204.01	$ 9,393,810.13	$ 9,675,624.43	$ 9,965,893.17	$ 10,264,869.96	$ 10,572,816.06	$ 10,890,000.54	$ 11,216,700.56	$ 11,553,201.58	$ 11,899,797.62
East St. Johns Siding/Main Track	**$51,080,416**	$ 52,612,828.48	$ 54,191,213.33	$ 55,816,949.73	$ 57,491,458.23	$ 59,216,201.97	$ 60,992,688.03	$ 62,822,468.67	$ 64,707,142.73	$ 66,648,357.02	$ 68,647,807.73
Lake Yard North Leads	**$18,438,483**	$ 18,991,637.49	$ 19,561,386.61	$ 20,148,228.21	$ 20,752,675.06	$ 21,375,255.31	$ 22,016,512.97	$ 22,677,008.36	$ 23,357,318.61	$ 24,058,038.17	$ 24,779,779.31
Portland Union Station	**$6,071,137**	$ 6,253,271.11	$ 6,440,869.24	$ 6,634,095.32	$ 6,833,118.18	$ 7,038,111.73	$ 7,249,255.08	$ 7,466,732.73	$ 7,690,734.71	$ 7,921,456.75	$ 8,159,100.46
Advanced Signal System	**$268,000,000**	$ 276,040,000.00	$ 284,321,200.00	$ 292,850,836.00	$ 301,636,361.08	$ 310,685,451.91	$ 320,006,015.47	$ 329,606,195.93	$ 339,494,381.81	$ 349,679,213.27	$ 360,169,589.66
2017 (Timetable E)											
Chehalis to Hannaford Third Main	**$67,011,238**	$ 69,021,575.14	$ 71,092,222.39	$ 73,224,989.07	$ 75,421,738.74	$ 77,684,390.90	$ 80,014,922.63	$ 82,415,370.31	$ 84,887,831.42	$ 87,434,466.36	$ 90,057,500.35
Ostrander to Winlock 3rd/4th Main	**$191,604,413**	$ 197,352,545.39	$ 203,273,121.75	$ 209,371,315.40	$ 215,652,454.87	$ 222,122,028.51	$ 228,785,689.37	$ 235,649,260.05	$ 242,718,737.85	$ 250,000,299.99	$ 257,500,308.99
2023 (Timetable F)											
Felida to MP 114 Third Main	**$104,112,633**	$ 107,236,011.99	$ 110,453,092.35	$ 113,766,685.12	$ 117,179,685.67	$ 120,695,076.24	$ 124,315,928.53	$ 128,045,406.39	$ 131,886,768.58	$ 135,843,371.64	$ 139,918,672.79
Hannaford to Nisqually Third Main	**$354,419,382**	$ 365,051,963.46	$ 376,003,522.36	$ 387,283,628.03	$ 398,902,136.88	$ 410,869,200.98	$ 423,195,277.01	$ 435,891,135.32	$ 448,967,869.38	$ 462,436,905.46	$ 476,310,012.63
Columbia River Bridge	**$500,000,000**	$ 515,000,000.00	$ 530,450,000.00	$ 546,363,500.00	$ 562,754,405.00	$ 579,637,037.15	$ 597,026,148.26	$ 614,936,932.71	$ 633,385,040.69	$ 652,386,591.91	$ 671,958,189.67

NOTES:

Shaded boxes indicate projects done by other jurisdiction or agency

Some projects did not have a ROW component and therefore was not included in calculations

Improvements were inflated by 3% compounded annually. This is based on WSDOT standard inflation numbers.

Appendix C
Capital Costs Based on Proposed Year of Construction

Seattle to Portland, OR

Project/Land	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
2005 (Timetable A)										
Felida Crossover										
Woodland Crossover										
Titlow Crossover										
Ruston Crossover										
Sound Transit										
2007 (Timetable B)										
Vancouver Rail Project										
Kelso-Martin's Bluff Rail Project										
Centennial Crossovers										
Winlock Crossover										
Ketron Crossover										
Tenino Crossover										
North Portland Junction to Kenton										
2009 (Timetable C)										
Pt. Defiance Bypass										
Reservation Third Main										
Centralia Steam Plant										
Woodland Siding										
Newaukum Crossover										
Seattle Maintenance Facility										
Chehalis Jct. Crossover										
China Creek Crossover										
King Street Station										
Sound Transit										
Auburn South Third Main										
2015 (Timetable D)										
Winlock to Chehalis Third Main	$ 131,661,731.29	$ 135,611,583.23								
Chehalis Siding	$ 12,256,791.55	$ 12,624,495.30								
East St. Johns Siding/Main Track	$ 70,707,241.96	$ 72,828,459.22								
Lake Yard North Leads	$ 25,523,172.69	$ 26,288,867.87								
Portland Union Station	$ 8,403,873.47	$ 8,655,989.67								
Advanced Signal System	$ 370,974,677.35	$ 382,103,917.67								
2017 (Timetable E)										
Chehalis to Hannaford Third Main	$ 92,759,225.36	$ 95,542,002.12	$ 98,408,262.18	$ 101,360,510.05						
Ostrander to Winlock 3rd/4th Main	$ 265,225,318.25	$ 273,182,077.80	$ 281,377,540.14	$ 289,818,866.34						
2023 (Timetable F)										
Felida to MP 114 Third Main	$ 144,116,232.97	$ 148,439,719.96	$ 152,892,911.56	$ 157,479,698.90	$ 162,204,089.87	$ 167,070,212.57	$ 172,082,318.94	$ 177,244,788.51	$ 182,562,132.17	$ 188,038,996.13
Hannaford to Nisqually Third Main	$ 490,599,313.01	$ 505,317,292.40	$ 520,476,811.17	$ 536,091,115.50	$ 552,173,848.97	$ 568,739,064.44	$ 585,801,236.37	$ 603,375,273.46	$ 621,476,531.66	$ 640,120,827.61
Columbia River Bridge	$ 692,116,935.36	$ 712,880,443.42	$ 734,266,856.73	$ 756,294,862.43	$ 778,983,708.30	$ 802,353,219.55	$ 826,423,816.14	$ 851,216,530.62	$ 876,753,026.54	$ 903,055,617.33

NOTES:

Shaded boxes indicate projects done by other jurisdiction or agency

Some projects did not have a ROW component and therefore was not included in calculations

Improvements were inflated by 3% compounded annually. This is based on WSDOT standard inflation numbers.

Appendix C
Capital Costs Based on Proposed Year of Construction

Seattle to Vancouver, BC

Project/Land	Base Year $	2004	2005	2006	2007	2008	2009	2010	2011
2005 (Timetable A and B)									
PA Jct. / Delta Jct.	**$30,367,977**	$ 31,279,016.31	$ 32,217,386.80						
Stanwood Siding	**$9,787,896**	$ 10,081,532.88	$ 10,383,978.87						
Bellingham GP Curve	**$1,997,592**	$ 2,057,519.76	$ 2,119,245.35						
Mt. Vernon Siding	**$8,037,909**	$ 8,279,046.27	$ 8,527,417.66						
SwiftCustoms Facility	**$12,000,000**	$ 12,360,000.00	$ 12,730,800.00						
Colebrook Siding	**$11,268,748**	$ 11,606,810.44	$ 11,955,014.75						
2009 (Timetable C, D, and E)									
Sound Transit	**$180,000,000**	$ 185,400,000.00	$ 190,962,000.00	$ 196,690,860.00	$ 202,591,585.80	$ 208,669,333.37	$ 214,929,413.38		
Bow to Samish Siding Extension	**$15,385,122**	$ 15,846,675.66	$ 16,322,075.93	$ 16,811,738.21	$ 17,316,090.35	$ 17,835,573.06	$ 18,370,640.26		
Bellingham Siding Extension	**$28,319,354**	$ 29,168,934.62	$ 30,044,002.66	$ 30,945,322.74	$ 31,873,682.42	$ 32,829,892.89	$ 33,814,789.68		
Ballard Bridge Speed	**$10,000,000**	$ 10,300,000.00	$ 10,609,000.00	$ 10,927,270.00	$ 11,255,088.10	$ 11,592,740.74	$ 11,940,522.97		
Vancouver BC									
Alternative 1:									
Willingdon Junction	**$14,684,800**	$ 15,125,344.00	$ 15,579,104.32	$ 16,046,477.45	$ 16,527,871.77	$ 17,023,707.93	$ 17,534,419.16		
CN Junction	**$3,563,817**	$ 3,670,731.51	$ 3,780,853.46	$ 3,894,279.06	$ 4,011,107.43	$ 4,131,440.65	$ 4,255,383.87		
Still Creek to CN Junction	**$12,884,086**	$ 13,270,608.58	$ 13,668,726.84	$ 14,078,788.64	$ 14,501,152.30	$ 14,936,186.87	$ 15,384,272.48		
Vancouver Terminal Control	**$6,721,120**	$ 6,922,753.60	$ 7,130,436.21	$ 7,344,349.29	$ 7,564,679.77	$ 7,791,620.17	$ 8,025,368.77		
Sperling to Willington Junction	**$10,353,909**	$ 10,664,526.27	$ 10,984,462.06	$ 11,313,995.92	$ 11,653,415.80	$ 12,003,018.27	$ 12,363,108.82		
Brunette to Piper Siding	**$25,521,605**	$ 26,287,253.15	$ 27,075,870.74	$ 27,888,146.87	$ 28,724,791.27	$ 29,586,535.01	$ 30,474,131.06		
Fraser River Bridge	**$500,000,000**	$ 515,000,000.00	$ 530,450,000.00	$ 546,363,500.00	$ 562,754,405.00	$ 579,637,037.15	$ 597,026,148.26		
Alterantive 2:									
Scott Road Station	**$75,000,000**	$ 77,250,000.00	$ 79,567,500.00	$ 81,954,525.00	$ 84,413,160.75	$ 86,945,555.57	$ 89,553,922.24		
2023 (Timetable F)									
Marysville to Mt. Vernon	**$277,162,285**	$ 285,477,153.55	$ 294,041,468.16	$ 302,862,712.20	$ 311,948,593.57	$ 321,307,051.37	$ 330,946,262.92	$ 340,874,650.80	$ 351,100,890.33
Burlington to Bellingham	**$217,852,072**	$ 224,387,634.16	$ 231,119,263.18	$ 238,052,841.08	$ 245,194,426.31	$ 252,550,259.10	$ 260,126,766.88	$ 267,930,569.88	$ 275,968,486.98
Bellingham to Blaine	**$123,797,720**	$ 127,511,651.60	$ 131,337,001.15	$ 135,277,111.18	$ 139,335,424.52	$ 143,515,487.25	$ 147,820,951.87	$ 152,255,580.43	$ 156,823,247.84
Everett Junction	**$9,921,785**	$ 10,219,438.55	$ 10,526,021.71	$ 10,841,802.36	$ 11,167,056.43	$ 11,502,068.12	$ 11,847,130.16	$ 12,202,544.07	$ 12,568,620.39
Advanced Signal (US)	**$138,000,000**	$ 142,140,000.00	$ 146,404,200.00	$ 150,796,326.00	$ 155,320,215.78	$ 159,979,822.25	$ 164,779,216.92	$ 169,722,593.43	$ 174,814,271.23
Advanced Signal (BC)	**$60,000,000**	$ 61,800,000.00	$ 63,654,000.00	$ 65,563,620.00	$ 67,530,528.60	$ 69,556,444.46	$ 71,643,137.79	$ 73,792,431.93	$ 76,006,204.88
White Rock Bypass	**$307,439,737**	$ 316,662,929.11	$ 326,162,816.98	$ 335,947,701.49	$ 346,026,132.54	$ 356,406,916.51	$ 367,099,124.01	$ 378,112,097.73	$ 389,455,460.66
Colebrook to Brownsville	**$79,926,112**	$ 82,323,895.36	$ 84,793,612.22	$ 87,337,420.59	$ 89,957,543.21	$ 92,656,269.50	$ 95,435,957.59	$ 98,299,036.31	$ 101,248,007.40

NOTES:
Shaded boxes indicate projects done by other jurisdiction or agency
Some projects did not have a ROW component and therefore was not included in calculations
Improvements were inflated by 3% compounded annually. This is based on WSDOT standard inflation numbers.

Seattle to Vancouver, BC

Project/Land	2012	2013	2014	2015	2016	2017	2018	2019	2020
2005 (Timetable A and B)									
PA Jct. / Delta Jct.									
Stanwood Siding									
Bellingham GP Curve									
Mt. Vernon Siding									
SwiftCustoms Facility									
Colebrook Siding									
2009 (Timetable C, D, and E)									
Sound Transit									
Bow to Samish Siding Extension									
Bellingham Siding Extension									
Ballard Bridge Speed									
Vancouver BC									
Alternative 1:									
Willingdon Junction									
CN Junction									
Still Creek to CN Junction									
Vancouver Terminal Control									
Sperling to Willington Junction									
Brunette to Piper Siding									
Fraser River Bridge									
Alterantive 2:									
Scott Road Station									
2023 (Timetable F)									
Marysville to Mt. Vernon	$ 361,633,917.04	$ 372,482,934.55	$ 383,657,422.58	$ 395,167,145.26	$ 407,022,159.62	$ 419,232,824.41	$ 431,809,809.14	$ 444,764,103.41	$ 458,107,026.52
Burlington to Bellingham	$ 284,247,541.59	$ 292,774,967.83	$ 301,558,216.87	$ 310,604,963.38	$ 319,923,112.28	$ 329,520,805.65	$ 339,406,429.81	$ 349,588,622.71	$ 360,076,281.39
Bellingham to Blaine	$ 161,527,945.28	$ 166,373,783.63	$ 171,364,997.14	$ 176,505,947.06	$ 181,801,125.47	$ 187,255,159.23	$ 192,872,814.01	$ 198,658,998.43	$ 204,618,768.38
Everett Junction	$ 12,945,679.00	$ 13,334,049.37	$ 13,734,070.86	$ 14,146,092.98	$ 14,570,475.77	$ 15,007,590.04	$ 15,457,817.74	$ 15,921,552.28	$ 16,399,198.85
Advanced Signal (US)	$ 180,058,699.37	$ 185,460,460.35	$ 191,024,274.16	$ 196,755,002.38	$ 202,657,652.46	$ 208,737,382.03	$ 214,999,503.49	$ 221,449,488.60	$ 228,092,973.25
Advanced Signal (BC)	$ 78,286,391.03	$ 80,634,982.76	$ 83,054,032.24	$ 85,545,653.21	$ 88,112,022.81	$ 90,755,383.49	$ 93,478,045.00	$ 96,282,386.35	$ 99,170,857.94
White Rock Bypass	$ 401,139,124.48	$ 413,173,298.22	$ 425,568,497.16	$ 438,335,552.08	$ 451,485,618.64	$ 465,030,187.20	$ 478,981,092.81	$ 493,350,525.60	$ 508,151,041.37
Colebrook to Brownsville	$ 104,285,447.63	$ 107,414,011.05	$ 110,636,431.39	$ 113,955,524.33	$ 117,374,190.06	$ 120,895,415.76	$ 124,522,278.23	$ 128,257,946.58	$ 132,105,684.98

NOTES:
Shaded boxes indicate projects done by other jurisdiction or agency
Some projects did not have a ROW component and therefore was not included in calculations
Improvements were inflated by 3% compounded annually. This is based on WSDOT standard inflation numbers.

Costs based on Proposed Year of Construction

Seattle to Vancouver, BC

Project/Land	2021	2022	2023
2005 (Timetable A and B)			
PA Jct. / Delta Jct.			
Stanwood Siding			
Bellingham GP Curve			
Mt. Vernon Siding			
SwiftCustoms Facility			
Colebrook Siding			
2009 (Timetable C, D, and E)			
Sound Transit			
Bow to Samish Siding Extension			
Bellingham Siding Extension			
Ballard Bridge Speed			
Vancouver BC			
Alternative 1:			
Willingdon Junction			
CN Junction			
Still Creek to CN Junction			
Vancouver Terminal Control			
Sperling to Willington Junction			
Brunette to Piper Siding			
Fraser River Bridge			
Alterantive 2:			
Scott Road Station			
2023 (Timetable F)			
Marysville to Mt. Vernon	$ 471,850,237.31	$ 486,005,744.43	$ 500,585,916.77
Burlington to Bellingham	$ 370,878,569.83	$ 382,004,926.93	$ 393,465,074.74
Bellingham to Blaine	$ 210,757,331.43	$ 217,080,051.38	$ 223,592,452.92
Everett Junction	$ 16,891,174.81	$ 17,397,910.05	$ 17,919,847.36
Advanced Signal (US)	$ 234,935,762.45	$ 241,983,835.32	$ 249,243,350.38
Advanced Signal (BC)	$ 102,145,983.67	$ 105,210,363.18	$ 108,366,674.08
White Rock Bypass	$ 523,395,572.61	$ 539,097,439.79	$ 555,270,362.98
Colebrook to Brownsville	$ 136,068,855.53	$ 140,150,921.19	$ 144,355,448.83

NOTES:
Shaded boxes indicate projects done by other jurisdiction or agency
Some projects did not have a ROW component and therefore was not included in calculations
Improvements were inflated by 3% compounded annually. This is based on WSDOT standard inflation numbers.