

A low-angle, upward-looking shot of a white and teal Sound Transit train. The train is moving along a track, and the camera is positioned below it, looking up at the side of the train. The train has several windows and a large teal stripe running along its side. The background shows a clear blue sky and a glass roof structure of a station.

Capital Cost Estimation Methodology

 **SOUNDTRANSIT**

General Estimating Methodology

- Standards
- Estimate Types
- Estimate Methods

Standards

- **AACE Recommended Practice No. 17R-97**
 - Probable Construction Cost consistent with Class 4 level of Project Definition
- **Construction Specification Institute (CSI) Master Format 2004**
 - General Format Used for Individual Construction Cost Items
- **FTA Standard Cost Categories (SCC)**
 - 10 – Guideway and Track Elements
 - 20 – Stations, Stops, Terminals, Intermodal
 - 30 – Support Facilities: Yards, Shops, Administration Buildings
 - 40 – Sitework and Special Conditions
 - 50 – Systems
 - 60 – Right-of-Way
 - 70 – Vehicles
 - 80 – Professional Services
 - 90 – Unallocated Contingency
 - 100 – Finance Charges

Estimate Types

- **Previous ST2 or HCT Study Cost Estimates - Unchanged**

- Project Definition Has Not Changed
- Construction Cost Escalated from Base Year to 4th Quarter 2014 using Sound Transit Construction Cost Index (CCI)
- Right-of-Way Cost Escalated from Base Year to 4th Quarter 2014 using Sound Transit ROW Cost Index (ROWI)
- Allocated Contingency, Professional Services and Unallocated Contingency revised per Current Methodology

- **New or Updated System Planning Projects**

- Develop Unit Cost Library (UCL) in 4th Quarter 2014 Dollars
- Develop Assemblies (Composite Sections) for Major Construction Elements based on Transit Modes and Alignment Definitions
- Prepare Quantity Takeoffs (QTO), by Assembly, for Identified Projects
- Prepare Cost Estimates for Identified Projects

Estimate Methods

- Unit Cost Library (SCC 10 – 50)

- Time & Material Unit Cost

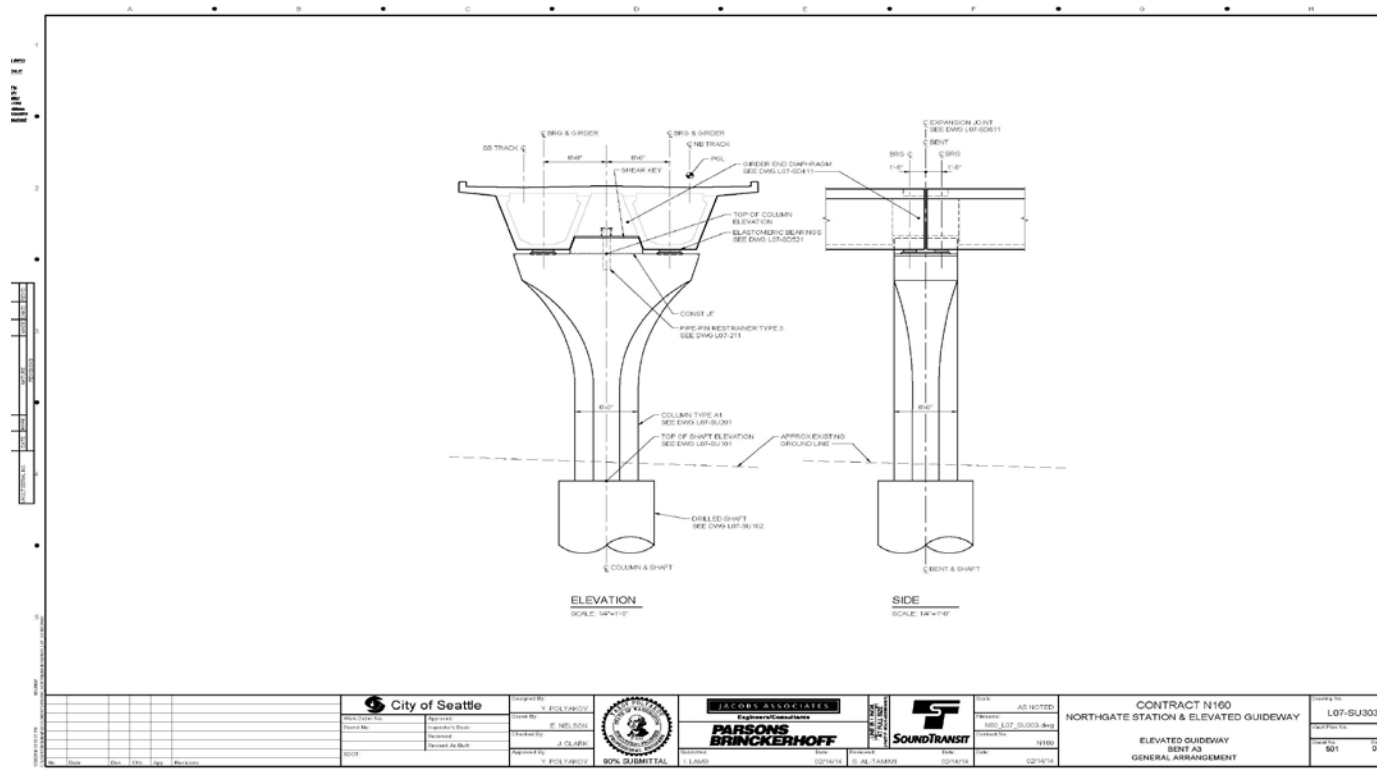
- Labor – Uses State of Washington Prevailing Wage Rates, includes Base Wage, Fringe Benefits, Payroll Taxes & Insurance
- Equipment – Uses Equipment Rental and Operating Rates published by RS Means
- Material – Uses multiple sources including RS Means, ENR Material Reports, Local Vendor Quotes
- Contractors Overhead and Profit – Typical markup allowances for contractors home and field office, field in-directs, sales tax, bond, general liability insurance, and profit .

- Subcontract Unit Cost

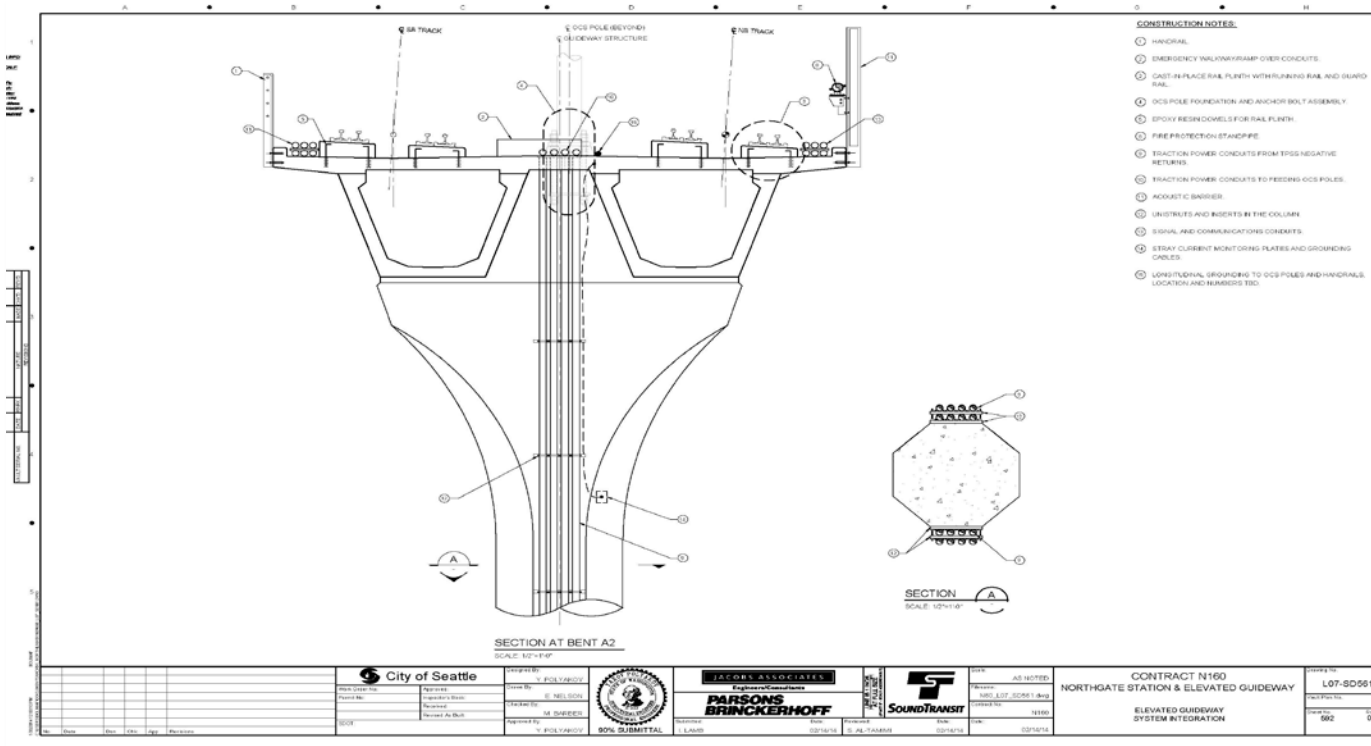
- Items typically procured from a subcontractor – Based on local historical cost data
- Contractor's Markup – Typical markup allowance for general contractors supervision and management

- Unit Cost Allowance

- Cost allowance for undefined project elements – Project metric based on historical cost data



Assemblies (Composite Cost)



Assemblies (Composite Cost)

Sound Transit

Unit Cost Library
 System Plan Development (ST3)

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Assembly	Phase	Item	Description	Takeoff Quantity	Bid Unit Price	Total Amount
10.04.222			PC Seg Box Girder - 2 Track (20' Avg. Pier Ht)			
	03-21-10.60	A010	Reinforcing Steel	112,000 lb	1.74	195.03
	03-30-53.40	A175	Structural Concrete, In Place, Aerial Pier	0.110 cy	797.27	87.70
	03-41-36.50	A035	Precast Segmental Box Girder, Double	1.000 lf	4,535.46	4,535.46
	05-05-23.80	A110	Multirotational Bearing (250 Kip)	0.020 ea	5,112.50	102.25
	05-73-16.10	A010	Metal Pipe & Cable Railing	1.000 lf	118.12	118.12
	26-05-26.80	A015	Corrosion Control, Aerial	1.000 lf	5.29	5.29
	31-63-26.13	A100	Drilled Shaft, 10' Dia.	0.830 vlf	3,650.71	3,030.09
	33-41-13.60	A025	Trackway Drainage Allowance, Aerial	1.000 lf	76.97	76.97
	33-71-19.17	A055	Cable Duct, Aerial Guideway	1.000 lf	91.60	91.60
	03-30-53.40	A195	Structural Concrete, In Place, Track Plinth	0.210 cy	1,115.19	234.19
	03-30-53.40	A205	Structural Concrete, In Place, OCS Pole Base	0.010 cy	1,373.00	13.73
	03-30-53.40	A180	Structural Concrete, In Place, Aerial Pier Cap	0.230 cy	1,117.43	257.01
	32-06-10.10	A100	Site Restoration Allowance	0.640 sy	80.67	51.63
	05-53-16.50	A010	Service/Safety Walkway	1.000 lf	75.71	75.71
	26-56-33.10	A010	Walkway lighting, Allowance	1.000 lf	49.40	49.40
	31-13-13.10	A015	Clearing & Grubbing Allowance, Level 2	3.460 sy	1.12	3.87
	32-35-16.10	A020	Sound Barriers	4.000 sf	30.90	123.61
	01-56-23.10	A030	MOT Allowance - Aerial	1.000 lf	69.30	69.30
			PC Seg Box Girder - 2 Track (20' Avg. Pier Ht)	1.000 RF	9,120.96	9,120.96

Assemblies (Composite Cost)

Sound Transit

Unit Cost Library
System Plan Development (ST3)

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Partial Totals

Description	Amount	Totals	Hours	Rate	Cost Basis	Percent of Total
Labor	1,335		3 ch			14.63%
Material	4,078					44.72%
Subcontract	35					0.39%
Equipment	746		2 ch			8.18%
Other						
	6,194	6,194				67.91 67.91%
Contractor's Overhead	924			15.000 % C		10.13%
Subcontract Markup	4			10.000 % C		0.04%
Field Supervision	496			8.000 % C		5.43%
Home Office	93			1.500 % C		1.02%
Sales Tax - General	458			9.500 % C		5.03%
Sales Tax - Subcontractor	2			4.750 % C		0.02%
Bond	62			1.000 % C		0.68%
Gen Liability & Builders Risk	124			2.000 % C		1.36%
Profit	248			4.000 % C		2.72%
	2,411	8,605				26.43 94.34%
Subtotal Construction		8,605				94.34%
General Conditions	516			6.000 % T		5.66%
	516	9,121				5.66 100.00%
Partial Total		9,121				

Quantity Takeoff (QTO)

Alternative: SP-2 from Segment 7

SEGMENT: Segment 9

Everett Station to North Everett

 3 Stations:
 Downtown Everett
 19th St
 Everett Community College

 STATIONING:
 2072+00 2185+00

 11,300.00 RF
 2.14 MILES

 By: Torger Erickson 6/5/2015
 Checked by:

SCC Cat.	STATIONING		DESCRIPTION	COST ID	QTY	UNIT	Comments
	BEGIN	END					
10 Guideway & Track Elements							
	10.01 Guideway: At-grade						
			At-Grade Ballasted - 1 Track	10 01 001		RF	
			At-Grade Ballasted - 2 Track	10 01 002		RF	All elevated
			At-Grade Embedded Streetcar Track in Asphalt Roadway - 1 Track	10 01 005		RF	
			At-Grade Embedded Streetcar Track in Asphalt Roadway - 2 Track	10 01 006		RF	
			At-Grade Embedded Streetcar Track in Concrete Roadway - 1 Track	10 01 007		RF	
			At-Grade Embedded Streetcar Track in Concrete Roadway - 2 Track	10 01 008		RF	
			At-Grade Direct Fixation Track in Express Median - 2 Track	10 01 009		RF	
			At-Grade Direct Fixation Track, Exclusive - 2 Track	10 01 010		RF	
			At-Grade Embedded Track, Exclusive - 2 Track	10 01 011		RF	
			At-Grade Embedded Track, Mixed Traffic - 2 Track	10 01 013		RF	
			At-Grade Direct Fixation Track, On Existing Structure - 2 Track	10 01 020		RF	
			At-Grade Roadway Track Crossing - 1 Track	10 01 051		RF	
			At-Grade Roadway Track Crossing - 2 Track	10 01 052		RF	
10.04 Guideway: Aerial Structure							
			Bridge Structure - Modification of Existing Structure	10 04 001		SF	
			Bridge Structure - 2 Track	10 04 023		RF	
	2072+00	2082+00	PC Seg Box Girder - 1 Track (20' Avg. Pier Ht)	10 04 122	1,000	RF	
	2082+00	2087+00	PC Seg Box Girder - 1 Track (30' Avg. Pier Ht)	10 04 123	500	RF	
	2087+00	2122+00	PC Seg Box Girder - 1 Track (40' Avg. Pier Ht)	10 04 124	3,500	RF	
			PC Seg Box Girder - 1 Track (50' Avg. Pier Ht)	10 04 125		RF	
	2122+00	2132+00	PC Seg Box Girder - 2 Track (20' Avg. Pier Ht)	10 04 222	1,000	RF	
			PC Seg Box Girder - 2 Track (30' Avg. Pier Ht)	10 04 223		RF	
	2132+00	2185+00	PC Seg Box Girder - 2 Track (40' Avg. Pier Ht)	10 04 224	5,300	RF	
			PC Seg Box Girder - 2 Track (50' Avg. Pier Ht)	10 04 225		RF	
			Twin Sngl PC Seg Box Girder - 2 Track (20' Avg. Pier Ht)	10 04 322		RF	
			Twin Sngl PC Seg Box Girder - 2 Track (30' Avg. Pier Ht)	10 04 323		RF	
			Twin Sngl PC Seg Box Girder - 2 Track (40' Avg. Pier Ht)	10 04 324		RF	
			Twin Sngl PC Seg Box Girder - 2 Track (50' Avg. Pier Ht)	10 04 325		RF	
			PC Seg Box Girder, Long Span - 2 Track (20' Avg. Pier Ht)	10 04 422		RF	

Prepare Cost Estimate

SOUND TRANSIT SYSTEM PLAN DEVELOPMENT (ST3) N-01							
TRANSIT MODE: LRT							
CAT NO.	DESCRIPTION	COST ID	QTY	UNIT	UNIT COST	BASE COST	ALLCTD CONTCY TOTAL COST
10 GUIDEWAY & TRACK ELEMENTS							
10.01	Guideway: At-grade (All Types)						
	N/A						
	Category Total		0	RF		\$0	\$0
10.04	Guideway: Aerial structure						
	PC Seg Box Girder - 1 Track (20' Avg. Pier Ht)	10.04.122	1,000	RF	\$7,144	\$7,143,770	30% \$9,286,901
	PC Seg Box Girder - 1 Track (30' Avg. Pier Ht)	10.04.123	500	RF	\$7,350	\$3,674,810	30% \$4,777,253
	PC Seg Box Girder - 1 Track (40' Avg. Pier Ht)	10.04.124	3,500	RF	\$7,464	\$26,123,895	30% \$33,961,064
	PC Seg Box Girder - 2 Track (20' Avg. Pier Ht)	10.04.222	1,000	RF	\$9,121	\$9,121,000	30% \$11,857,300
	PC Seg Box Girder - 2 Track (40' Avg. Pier Ht)	10.04.224	5,300	RF	\$9,423	\$49,942,483	30% \$64,925,228
	Category Total		11,300	RF		\$96,005,958	\$124,807,745
10.05	Guideway: Built-up fill						
	N/A						
	Category Total		0	RF		\$0	\$0
10.06	Guideway: Underground cut & cover						
	N/A						
	Category Total		0	RF		\$0	\$0
10.07	Guideway: Underground tunnel						
	N/A						
	Category Total		0	RF		\$0	\$0
10.08	Guideway: Retained cut or fill						
	N/A						
	Category Total		0	RF		\$0	\$0
10.09	Track: Direct fixation						
	Direct Fixation Track - 2 Track	10.09.120	11,300	RF	\$1,034	\$11,679,002	30% \$15,182,703
	Category Total		11,300	RF		\$11,679,002	\$15,182,703

Right –of-Way (SCC 60)

- Assessed Property Values – from County Assessor
- Real Estate Adjustment Factors – for typical difference between assessed value and sale value for residential & commercial property by location
- Profile Factors – adjustment for:
 - Aerial = 0.75
 - At-Grade = 1.00
 - Deep Tunnel (>70 ft) = 0.50
 - Shallow Tunnel (<70 ft) = 0.65
- ROW Contingency – 1.65
- Range - $\pm 15\%$

Vehicles (SCC 70)

- Cost for vehicles will be included based on recent procurement contracts by Sound Transit.

Professional Services (SCC 80)

Projects under \$25M	Allowance
Admin *	7.00%
Prelim. Engineering	9.50%
Final Design/ DSDC	15.50%
Third Parties	2.00%
Const. Management	14.00%
Total **	48.00%

Projects over \$25M	Allowance
Admin *	6.00%
Prelim. Engineering	5.00%
Final Design/ DSDC	10.00%
Third Parties	2.00%
Const. Management	9.00%
Total **	32.00%

*Admin is a percent of SCC 10-70 plus all other soft costs. All others are percent of construction.

**Actual effective total is greater than shown due to the application of Admin to non-construction costs.

Contingencies

- Allocated Contingency – Applied by SCC category to line items within Cost Estimate
 - SCC 10 – 50: 30% Contingency
 - SCC 60: 65% Contingency
 - SCC 70: 20% Contingency
 - SCC 80: Calculated on total values that include design allowance, art allowance and change order contingency
- 1% for Art Allowance – Applied to Subtotal of SCC 10 – 50
- Change Order Contingency – Applied to Subtotal of SCC 10 – 50 including Allocated Contingency
- Unallocated Contingency – Applied to Subtotal of SCC 10 – 50, including Art Allowance and Change Order Contingency

