



O&M Costs - ST3 Expert Review Panel

November 2015



2008 Forecasts vs Actual O&M Costs

	CR	STEX	Light Rail
	2009 to 2014	2009 to 2014	2009 to 2014
2008 Pre-ST2 Vote Plan	\$262,447	\$661,640	\$260,941
2015 Financial Plan (Actuals)	\$213,122	\$591,770	\$331,390
\$ Different	(\$49,325)	(\$69,871)	\$70,448
% Different	-23%	-12%	21%

Methodology

- Building block costs for O&M drivers calculated from O&M models maintained by ST Finance staff.
- Separate cost components for each mode.
- All costs in each modal model accounted for.
 - Cost components each include 10% charge for agency overhead.
 - Source of each cost is documented, including modal model, tab, formula, cells, and details of what is included.
- Operating statistics for each ST3 project provided by consultants.

Light Rail – Track O&M

Cost Type	Component	Annual Cost/ Component (2014 \$)	Cost Includes
Elevated Alignment	Elevated Track Miles	\$ 466,175	<ul style="list-style-type: none"> • Non-labor ROW cost for each track type • Average ROW labor cost per mile
At-grade Alignment	At-Grade Track Miles	\$ 453,297	
Below-grade Alignment	Below-Grade Track Miles	\$ 459,736	
Catenary & TPSS	Track Miles	\$ 24,977	<ul style="list-style-type: none"> • Average catenary cost per mile
Signal Maintenance/ MOW	Track Miles	\$ 11,590	<ul style="list-style-type: none"> • Non-labor signal cost
Traction Power - SCL	Track Miles	\$ 71,922	<ul style="list-style-type: none"> • Electrical substation cost at 2.5% grade per 1.75 miles for each utility
Traction Power - PSE	Track Miles	\$ 105,725	
Traction Power - SNO PUD	Track Miles	\$ 89,183	
Traction Power - TPU	Track Miles	\$ 52,121	

Light Rail – Vehicle O&M

Cost Type	Component	Annual Cost/ Component (2014 \$)	Includes
Vehicle Operating	Vehicles	\$ 228,686	<ul style="list-style-type: none"> Total light rail operations staffing cost per vehicle
Vehicle Maintenance	Vehicles	\$ 206,529	<ul style="list-style-type: none"> Light rail non-labor maintenance cost per vehicle (48 month and 60 month maintenance) Total light rail maintenance staffing cost per vehicle
Insurance- Vehicles	Vehicles	\$ 5,251	<ul style="list-style-type: none"> Insurance cost per vehicle
Insurance – Liability	Boardings	\$ 0.155	<ul style="list-style-type: none"> Insurance cost per rider
Excise Taxes	Boardings	\$ 0.033	<ul style="list-style-type: none"> Assumes an average fare per boarding of \$1.30

Light Rail – Station O&M

Cost Type	Component	Annual Cost/ Component (2014 \$)	Includes
Elevated Station	Elevated Stations	\$ 617,882	<ul style="list-style-type: none"> • Labor (custodian and ground specialist) • Station services (consumables, elevators/ escalators, signage) • Utilities • TMV services • Paratransit cost per station
At-grade Station	At-grade Stations	\$ 529,999	
Below-grade Station	Below-grade stations	\$ 955,010	
Parking Facility	Garages/ lots	\$ 97,872	<ul style="list-style-type: none"> • Garage services (labor, consumables, elevators) • Utilities • Lease
OMF	OMFs	\$ 2,514,703	<ul style="list-style-type: none"> • Labor • Station services (consumables, elevators/ escalators, signage) • Utilities

Sounder – Track O&M

Cost Type	Component	Annual Cost/ Component (2014 \$)	Includes
Signal Maintenance/ MOW	Track Miles	\$ 115,884	<ul style="list-style-type: none"> • MOW Services • Materials • Flagging • Extra work • Positive train control
Motive Power (fuel)	Annual Platform Train Miles	\$ 17	<ul style="list-style-type: none"> • Fuel cost per platform train mile
Ad Valorem Taxes (BNSF Improvements)	Annual Platform Train Miles	\$ 2.27	<ul style="list-style-type: none"> • BNSF improvement cost per platform train mile

Sounder – Vehicle O&M

Cost Type	Component	Annual Cost/ Component (2014 \$)	Includes
Vehicle Maintenance	Vehicles	\$ 221,513	<ul style="list-style-type: none"> • Maintenance cost of coach cars and cab cars • Cost per car of Amtrak labor
Locomotive Maintenance	Locomotives	\$ 229,601	<ul style="list-style-type: none"> • Maintenance cost of locomotives • Cost per car of Amtrak labor
Vehicle Operating	Annual Platform Train Miles	\$ 40	<ul style="list-style-type: none"> • Labor costs • Public Utility Taxes • WUTC Regulatory fees
Insurance- Vehicles	Vehicles	\$ 5,269	<ul style="list-style-type: none"> • Insurance cost per vehicle
Insurance – Liability	Boardings	\$ 0.180	<ul style="list-style-type: none"> • Insurance cost per rider
Excise Taxes	Boardings	\$ 0.081	<ul style="list-style-type: none"> • Assumes an average fare per boarding of \$3.20

Sounder – Station O&M

Cost Type	Component	Annual Cost/ Component (2014 \$)	Includes
At-grade Sounder station	Stations	\$ 275,280	<ul style="list-style-type: none"> • Station services (contract services, consumables, elevators) • Signage maintenance • Utilities • Labor (station agent, agent supervisor, program manager) • TVM services
Parking facility	Garages/ lots	\$ 97,872	<ul style="list-style-type: none"> • Average operating cost of all Sounder parking structures.
OMF	OMFs	\$ 2,514,703	<ul style="list-style-type: none"> • Labor • Station services (consumables, elevators/ escalators, signage) • Utilities

BRT & ST Express

Cost Type	Component	Annual Cost/ Component (2014 \$)	Includes
Bus Operations	Platform Hours	\$ 188	<ul style="list-style-type: none"> • Administration • Insurance • Vehicle operations and maintenance
Transit Centers/ Stations	TCs/ Stations	\$ 79,501	<ul style="list-style-type: none"> • Station services (labor, consumables, signage, elevators) • Utilities • TMV Services
Parking facility	Garages/ lots	\$ 97,872	<ul style="list-style-type: none"> • Average operating cost of all Sounder parking structures
OMF	OMFs	\$ 2,514,703	<ul style="list-style-type: none"> • Labor • Station services (consumables, elevators/ escalators, signage) • Utilities
Excise Taxes	Boardings	0.0543	<ul style="list-style-type: none"> • Excise tax, assuming average fare per boarding of \$2.15

Security

- Calculated separately for each ST3 project.
- Reviewed and validated by Chief Security Officer.
- Assumptions:
 - For each new corridor/ alignment, include:
 - Securitas: One 24/7 post (4 patrol officers) and 1 new supervisor.
 - King County Sheriff's Office: Patrol sergeant, 10 transit patrol officers, and associated supplies and vehicles.
 - For all projects, include one 24/7 post for each of the following:
 - Terminal station, underground station, OMF, layover yard, mid-day bus storage.

Security (continued)

- Fare Enforcement Officers (FEOs)
 - Light Rail/ T Link/ CR: 1.2 FEOs per million boardings.
 - BRT: 1.3 FEOs per million boardings.
 - Supervisor for every six FEOs.

Sample Draft O&M Costs – Light Rail

Project	Mode	Miles	O&M Cost (2014\$)	O&M Cost per Mile
DT Seattle to Ballard: at-grade along Elliott and 15th Ave.	LRT	7.4	\$ 21,565,639	\$ 2,925,657
DT Seattle to Ballard: elevated along Elliott and 15th Ave.	LRT	5.4	\$ 22,964,849	\$ 4,240,554
Lynnwood to Everett via I-5	LRT	12.6	\$ 61,174,033	\$ 4,858,412
Federal Way to Tacoma Dome Station via I-5	LRT	9.8	\$ 31,863,680	\$ 3,252,905
Central Link (actual 2014 cost)	LRT	13.9	\$ 58,236,373	\$ 4,189,667

- Average O&M cost per mile of ST3 light rail projects: \$3.7 million per mile. (Does not include projects with no mileage, such as infill stations.)

Sample Draft O&M Costs – Other Modes

Project	Mode	Miles	O&M Cost (2014\$)	O&M Cost per Mile
I-405 BRT (Low Cost)	BRT	44.8	\$ 49,928,023	\$ 1,114,465
Tacoma Link Extension to Tacoma Community College	T Link	3.6	\$ 10,611,564	\$ 2,931,371
Infill Sounder Station, Boeing Access Rd	CR	0	\$ 608,614	n/a