

Draft Operating Plans and O&M Cost Estimates

OPERATING PLAN ASSUMPTIONS

Operating requirements were generated based on operating plans that incorporate run-time estimates and general operating assumptions for the three build alternatives advanced into final screening in the Central Omaha Transit Alternatives Analysis:

- Alternative 1 – BRT on Dodge/Douglas
- Alternative 2 – BRT on Farnam/Harney
- Alternative 3 – Streetcar on Farnam/Harney

STATION-TO-STATION RUN TIME ESTIMATES

Run time estimates were calculated with a computer simulation model developed by HDR for the study. The model was calibrated based on performance characteristics of typical low-floor BRT and Streetcar vehicles. Inputs to the run time model include the following inputs:

- Alignments and station locations – based on the maps of general alignments and station locations for each alternative.
- Vehicle performance - acceleration & deceleration rates and maximum operating speeds:
 - BRT – assumed to have a normal service maximum acceleration rate of about 2.0 miles per hour per second (mphps) from 0 to 30 miles per hour (mph), with an average acceleration rate of 0.75 mphps from 0 mph to achieve a maximum speed of 65 mph. Normal service braking is assumed to be a constant 2.0 mphps from 65 mph to 0 mph.
 - Streetcar – assumed to have a normal service maximum acceleration rate of about 2.5 miles per hour per second (mphps) from 0 to 30 miles per hour (mph), with an average acceleration rate of 1.75 mphps from 0 mph to achieve a maximum speed of 45 mph. Normal service braking is assumed to be a constant 2.5 mphps from 45 mph to 0 mph.
- Current average speeds of Metro bus service of 12mph in corridor for comparison to factor potential traffic impacts to schedules
- Speed restrictions - Based on posted civil speed limits and horizontal curves along the alignment, which will impact whether vehicles can achieve maximum speed.
- Average station dwell times – 20 seconds applied at each station.
- Average intersection delay – 20 seconds at major arterial signalized intersections, 10 seconds at minor signalized intersections. No delay to be incurred at intersections planned for transit signal priority and/or queue jump lanes improvements.

The following provides a description of the categories presented in the station-to-station run time tables:

- Max Speed (mph) – represents the maximum speed that the vehicle can achieve based on the posted speed limit along alignment segments between each station.

- Avg. Speed (mph) – represents the average speed performed based on the total run time (including intersection delay and dwell time) and distance between each station.
- Distance (miles) – incremental distance between each stations and the total cumulative distance at each station from the beginning station.
- Run Time – incremental running time of the vehicle between each station based on vehicle performance and maximum speed restrictions, not including any delay time at intersections and station dwell time.
- Delay Time – total of time delay incurred at signalized intersections between stations.
- Dwell Time – assumed average time for passengers to board and alight vehicles.
- Total Time – cumulative running time including intersection delay and station dwell time at each station.

Alternative 1 - BRT (Dodge/Douglas) Run Times

Station	Max. Speed	Avg. Speed	Distance (miles)		Run Time	Delay Time	Dwell Time	Total Time
	(mph)	(mph)	Increment	Total	(hr:min:sec)	(hr:min:sec)	(hr:min:sec)	(hr:min:sec)
72nd St.				0.00			00:00:00	00:00:00
<i>Mixed Traffic (Dodge St.)</i>	35	19.2	0.81		00:01:42	00:00:30		
62nd St.				0.81			00:00:20	00:02:32
<i>Mixed Traffic (Dodge St.)</i>	35	21.8	0.94		00:01:55	00:00:20		
50th St.				1.75			00:00:20	00:05:07
<i>Mixed Traffic (Dodge St.)</i>	35	18.6	0.76		00:01:37	00:00:30		
42nd St.				2.51			00:00:20	00:07:34
<i>Mixed Traffic (Dodge St.)</i>	35	16.0	0.48		00:01:08	00:00:20		
36th St.				2.99			00:00:20	00:09:22
<i>Mixed Traffic (Dodge St.)</i>	35	12.5	0.26		00:00:45	00:00:10		
33rd St.				3.25			00:00:20	00:10:37
<i>Mixed Traffic (Dodge St.)</i>	35	11.8	0.19		00:00:38	00:00:00		
31st St.				3.44			00:00:20	00:11:35
<i>Mixed Traffic (Dodge St./Douglas St.)</i>	35	16.8	0.62		00:01:23	00:00:30		
24th St.				4.06			00:00:20	00:13:48
<i>Mixed Traffic (Dodge St./Douglas St.)</i>	30	19.6	0.24		00:00:44	00:00:00		
20th St.				4.30			00:00:00	00:14:32
<i>Mixed Traffic (Dodge St./Douglas St.)</i>	25	9.6	0.27		00:00:51	00:00:30		
16th St. (@ Farnam St./Harney St.)				4.57			00:00:20	00:16:13
<i>Mixed Traffic (Dodge St./Douglas St.)</i>	25	8.9	0.20		00:00:41	00:00:20		
13th St.				4.77			00:00:20	00:17:34
<i>Mixed Traffic (Dodge St./Douglas St.)</i>	25	8.4	0.15		00:00:34	00:00:10		
11th St.				4.92			00:00:20	00:18:38
<i>Mixed Traffic (Dodge St./Douglas St./10th St.)</i>	25	11.2	0.18		00:00:38	00:00:00		
Capitol Ave.				5.10			00:00:20	00:19:36
<i>Mixed Traffic (10th St.)</i>	25	12.0	0.21		00:00:43	00:00:00		
Cass St.				5.31			00:00:20	00:20:39
<i>Mixed Traffic (10th St./Fahey St.)</i>	25	12.1	0.28		00:00:53	00:00:10		
12th St.				5.59			00:00:20	00:22:02
<i>Mixed Traffic (Fahey St.)</i>	25	8.9	0.28		00:00:53	00:00:40		
16th St. (@ Fahey St.)				5.87			00:00:20	00:23:55
TOTAL				5.87	00:15:05	00:04:10	00:04:40	00:23:55
						Avg. Speed =	14.7 mph	
						Avg. Station Spacing =	0.4 miles	

Alternative 2 - BRT (Farnam/Harney) Run Times

Station	Max. Speed	Avg. Speed	Distance (miles)		Run Time	Delay Time	Dwell Time	Total Time
	(mph)	(mph)	Increment	Total	(hr:min:sec)	(hr:min:sec)	(hr:min:sec)	(hr:min:sec)
72nd St.				0.00			00:00:00	00:00:00
<i>Mixed Traffic (Dodge St.)</i>	35	19.2	0.81		00:01:42	00:00:30		
62nd St.				0.81			00:00:20	00:02:32
<i>Mixed Traffic (Dodge St.)</i>	35	21.8	0.94		00:01:55	00:00:20		
50th St.				1.75			00:00:20	00:05:07
<i>Mixed Traffic (Dodge St., 44th St., Farnam St.)</i>	35	18.9	0.90		00:01:51	00:00:40		
42nd St.				2.65			00:00:20	00:07:58
<i>Dedicated Transit Lane (Farnam St.)</i>	30	16.8	0.48		00:01:13	00:00:10		
36th St.				3.13			00:00:20	00:09:41
<i>Dedicated Transit Lane (Farnam St.)</i>	30	12.3	0.26		00:00:46	00:00:10		
33rd St.				3.39			00:00:20	00:10:57
<i>Dedicated Transit Lane (Farnam St.)</i>	30	10.1	0.19		00:00:38	00:00:10		
31rd St.				3.58			00:00:20	00:12:05
<i>Dedicated Transit Lane (Farnam St./Harney St.)</i>	30	16.1	0.62		00:01:29	00:00:30		
24th St.				4.20			00:00:20	00:14:24
<i>Dedicated Transit Lane (Farnam St./Harney St.)</i>	30	19.6	0.24		00:00:44	00:00:00		
20th St.				4.44			00:00:00	00:15:08
<i>Dedicated Transit Lane (Farnam St./Harney St.)</i>	25	9.6	0.27		00:00:51	00:00:30		
16th St. (@ Farnam St./Harney St.)				4.71			00:00:20	00:16:49
<i>Dedicated Transit Lane (Farnam St./Harney St.)</i>	25	8.9	0.20		00:00:41	00:00:20		
13th St.				4.91			00:00:20	00:18:10
<i>Dedicated Transit Lane (Farnam St./Harney St.)</i>	25	8.4	0.15		00:00:34	00:00:10		
11th St.				5.06			00:00:20	00:19:14
<i>Mixed Traffic (Farnam St./Harney St., 10th St.)</i>	25	14.6	0.32		00:00:59	00:00:00		
Capitol Ave.				5.38			00:00:20	00:20:33
<i>Mixed Traffic (10th St.)</i>	25	12.0	0.21		00:00:43	00:00:00		
Cass St.				5.59			00:00:20	00:21:36
<i>Mixed Traffic (10th St./Fahey St.)</i>	25	12.1	0.28		00:00:53	00:00:10		
12th St.				5.87			00:00:20	00:22:59
<i>Mixed Traffic (Fahey St.)</i>	25	8.9	0.28		00:00:53	00:00:40		
16th St. (@ Fahey St.)				6.15			00:00:20	00:24:52
TOTAL				6.15	00:15:52	00:04:20	00:04:40	00:24:52
						Avg. Speed =	14.8 mph	
						Avg. Station Spacing =	0.4 miles	

Alternative 3 - Streetcar (Farnam/Harney) Run Times

Station	Max. Speed	Avg. Speed	Distance (miles)		Run Time	Delay Time	Dwell Time	Total Time
	(mph)	(mph)	Increment	Total	(hr:min:sec)	(hr:min:sec)	(hr:min:sec)	(hr:min:sec)
42nd St.				0.00			00:00:00	00:00:00
<i>Dedicated Transit Lane (Farnam St.)</i>	30	11.3	0.16		00:00:31	00:00:00		
40th St.				0.16			00:00:20	00:00:51
<i>Dedicated Transit Lane (Farnam St.)</i>	30	14.4	0.32		00:00:50	00:00:10		
36th St.				0.48			00:00:20	00:02:11
<i>Dedicated Transit Lane (Farnam St.)</i>	30	12.8	0.26		00:00:43	00:00:10		
33rd St.				0.74			00:00:20	00:03:24
<i>Dedicated Transit Lane (Farnam St.)</i>	30	10.5	0.19		00:00:35	00:00:10		
31rd St.				0.93			00:00:20	00:04:29
<i>Dedicated Transit Lane (Farnam St./Harney St.)</i>	30	13.1	0.40		00:01:00	00:00:30		
26th St.				1.33			00:00:20	00:06:19
<i>Dedicated Transit Lane (Farnam St./Harney St.)</i>	30	11.6	0.22		00:00:38	00:00:10		
24th St.				1.55			00:00:20	00:07:27
<i>Dedicated Transit Lane (Farnam St./Harney St.)</i>	30	21.1	0.24		00:00:41	00:00:00		
20th St.				1.79			00:00:00	00:08:08
<i>Dedicated Transit Lane (Farnam St./Harney St.)</i>	25	9.8	0.27		00:00:49	00:00:30		
16th St. (@ Farnam St./Harney St.)				2.06			00:00:20	00:09:47
<i>Dedicated Transit Lane (Farnam St./Harney St.)</i>	25	9.1	0.20		00:00:39	00:00:20		
13th St.				2.26			00:00:20	00:11:06
<i>Dedicated Transit Lane (Farnam St./Harney St.)</i>	25	8.7	0.15		00:00:32	00:00:10		
11th St.				2.41			00:00:20	00:12:08
<i>Mixed Traffic (Farnam St./Harney St.,10th St.)</i>	25	15.2	0.32		00:00:56	00:00:00		
Capitol Ave.				2.73			00:00:20	00:13:24
<i>Mixed Traffic (10th St.)</i>	25	12.6	0.21		00:00:40	00:00:00		
Cass St.				2.94			00:00:20	00:14:24
<i>Mixed Traffic (10th St./Fahey St.)</i>	25	12.6	0.28		00:00:50	00:00:10		
12th St.				3.22			00:00:20	00:15:44
<i>Mixed Traffic (Fahey St.)</i>	25	9.2	0.28		00:00:50	00:00:40		
16th St. (@ Fahey St.)				3.50			00:00:20	00:17:34
TOTAL				3.50	00:10:14	00:03:00	00:04:20	00:17:34
						Avg. Speed =	12.0 mph	
						Avg. Station Spacing =	0.2 miles	

OPERATING REQUIREMENTS

Operating statistics were projected based on general operating assumptions for each alternative and include calculating peak vehicles, annual-vehicle hours, and vehicle miles as inputs into the cost model for developing O&M cost estimates. Total fleet vehicle requirements were calculated for use in the capital cost estimates.

Level of Service

Day of Week	Time Period	Span of Service	Frequency	Operating Hours
Monday-Friday	AM Off-Peak	5:00am - 7:00am	15 minutes	2.0
	Daytime Peak	7:00am - 7:00pm	10 minutes	12.0
	PM Off-Peak	7:00pm - 9:00pm	15 minutes	2.0
	Evening	9:00pm - 12:00am	20 minutes	3.0
	Weekday Total			
Saturday	Daytime	6:00am - 9:00pm	15 minutes	15.0
	Evening	9:00pm - 12:00am	20 minutes	3.0
	Saturday Total			
Sunday & Holidays	Daytime	7:00am - 7:00pm	15 minutes	12.0
	Sunday & Holidays Total			

Days of Operation: Annual operating requirements were calculated assuming Metro’s current annual days of operation for weekdays (256 days), Saturdays (52 days) and Sundays & Holidays (57 days).

End of Line Layovers: 10% of estimated run time as a minimum standard.

Maintenance Spare Ratio: 20% of the peak vehicle requirement as a minimum standard.

Peak and Fleet Vehicle Requirements: The peak vehicle requirements were calculated for each alternative incorporating operating requirements based on cycle times that factor run-times, layovers and service frequencies. The maintenance spare ratio was applied to the peak vehicle requirement to determine the total fleet requirement in order to estimate associated capital costs with procurement of new BRT and Streetcar vehicles.

Alternative 1 - BRT (Dodge/Douglas) Operating Statistics

Run Time (hr:min:sec)	Distance (miles)	---Headway---				----Annual Revenue----		Lay Over	Cycle Time	--Vehicle Requirement--		
		Day	Peak	Off-Peak	Evening	Veh-Miles	Veh-Hours			Peak	Off-Pk	Evening
00:23:55	5.87	Weekdays	10.0	15.0	20.0	216,400	18,430	6.1	60.0	6	4	3
						48,100	4,100					
						27,000	11,520					
		Saturdays	15.0		20.0	36,600	3,120	6.1	60.0	4		3
						5,500	470					
		Sundays	15.0			32,100	2,740	6.1	60.0	4		

ESTIMATED TOTALS: **40,380** annual revenue vehicle-hours
 365,700 annual revenue vehicle-miles
 PEAK VEHICLE REQUIREMENT: **6** vehicles
 FLEET VEHICLE REQUIREMENT: **8** vehicles

Alternative 2 - BRT (Farnam/Harney) Operating Statistics

Run Time (hr:min:sec)	Distance (miles)	---Headway---				----Annual Revenue----		Lay Over	Cycle Time	--Vehicle Requirement--		
		Day	Peak	Off-Peak	Evening	Veh-Miles	Veh-Hours			Peak	Off-Pk	Evening
00:24:52	6.15	Weekdays	10.0	15.0	20.0	226,700	18,430	5.1	60.0	6	4	3
						50,400	4,100					
						28,300	11,520					
		Saturdays	15.0		20.0	38,400	3,120	5.1	60.0	4		3
						5,800	470					
		Sundays	15.0			33,700	2,740	5.1	60.0	4		

ESTIMATED TOTALS: **40,380** annual revenue vehicle-hours
 383,300 annual revenue vehicle-miles
 PEAK VEHICLE REQUIREMENT: **6** vehicles
 FLEET VEHICLE REQUIREMENT: **8** vehicles

Alternative 3 - Streetcar (Farnam/Harney) Operating Statistics

Run Time (hr:min:sec)	Distance (miles)	---Headway---				----Annual Revenue----		Lay Over	Cycle Time	--Vehicle Requirement--		
		Day	Peak	Off-Peak	Evening	Veh-Miles	Veh-Hours			Peak	Off-Pk	Evening
00:17:34	3.34	Weekdays	10.0	15.0	20.0	123,100	12,290	2.5	40.0	4	3	3
						27,400	3,070					
						15,400	11,520					
		Saturdays	15.0		20.0	20,800	2,340	5.0	45.0	3		3
						3,100	470					
		Sundays	15.0			18,300	2,050	5.0	45.0	3		

ESTIMATED TOTALS: **31,740** annual revenue vehicle-hours
 208,100 annual revenue vehicle-miles
 PEAK VEHICLE REQUIREMENT: **4** vehicles
 FLEET VEHICLE REQUIREMENT: **5** vehicles

O&M COST ESTIMATE METHODOLOGY

The O&M model and cost estimation methods are consistent with the Federal Transit Administration (FTA) accepted practice by developing a fully allocated cost model utilizing multiple supply variables. An O&M model was developed for both the BRT and Streetcar alternatives. The BRT O&M unit costs and cost estimates were prepared utilizing Metro's FY 2012 operating expenses for bus service. Streetcar operation O&M estimates were developed based on FY 2011 National Transit Database (NTD) operating and financial data from other modern Streetcar systems currently in operation, including:

- Portland, OR
- Seattle, WA
- Tacoma, WA

Expenses were categorized by operating function (i.e. vehicle operation, vehicle maintenance, non-vehicle maintenance and general administration) and broken out by the following expense categories reported:

- Operator Salaries and Wages
- Other Salaries and Wages
- Fringe benefits
- Services
- Fuel & Lubricants (BRT only)
- Tires & Tubes (BRT only)
- Other Materials & Supplies
- Utilities (Streetcar only)
- Casualty and Liability
- Taxes
- Expense Transfers (Streetcar Only)

Operating expenses were allocated to the following driving supply variables:

- Stations: Total number of stations along the alignment (BRT only). This is a new cost not currently captured in Metro's operating expenses that would be incurred for cleaning and maintenance of BRT stations. This is based on reported station maintenance costs per station location for the Emerald Express (EmX) BRT system in Eugene, OR.
- Route-Miles: Total mileage in one direction of the route path that the vehicle travels while in revenue service (Streetcar only). Route-miles is considered not as reliable of a measure for bus operations due to more instances of overlapping of routes, deviated trips off of trunk routes and restructuring of routes.
- Yards: Total number of maintenance storage facilities including rail yards. Metro's current facility is designed for 234 buses, 25 vans & 10 support vehicles and includes an articulated bus pit for service and inspection purposes. No facility expansion or retrofitting would be required to support maintenance of a new BRT fleet. The current non-vehicle maintenance costs at the Metro facility to support fixed-route bus service are considered fixed. An expansion and retrofitting of the existing Metro facility or a new facility dedicated to Streetcar maintenance

would be required. A fixed cost for rail yards was applied based on an average of non-vehicle maintenance costs reported by peer Streetcar systems to support maintenance of an average fleet of about 6 Streetcars.

- Annual Revenue Bus/Train-Hours: Total hours of revenue service operated by all buses or Streetcar trains in one year.
- Annual Revenue Bus/Car-Miles: Total miles of revenue service operated by all buses or Streetcar vehicles in one year.
- Peak Vehicles: The maximum number of buses or Streetcar vehicles required for scheduled peak service.

The key driving supply variables were assigned to each expense line item, presented below.

BRT and Streetcar Expense Allocations

Expense Object	Route-Miles (Streetcar Only)	Yards (Streetcar only)	Bus/Train-Hours	Bus/Car-Miles	Peak Vehicles/ Cars
Operators Salaries/Wages			✓		
Salaries/Wages	✓	✓	✓	✓	✓
Fringe Benefits	✓	✓	✓	✓	✓
Services	✓	✓	✓	✓	✓
Fuel & Lubricants (BRT only)				✓	
Tires & Tubes (BRT only)				✓	
Other Materials & Supplies	✓	✓		✓	✓
Utilities (Streetcar only)	✓	✓		✓	
Casualty/Liability	✓	✓		✓	
Taxes		✓			
Miscellaneous Expenses	✓	✓		✓	✓
Expense Transfers (Streetcar Only)	✓	✓			✓

Unit costs were calculated based on total expenses and units of service supplied for each variable reported. Operating expenses assigned to each variable will be summed and divided by units of service to derive unit costs. The following equations summarize the fully-allocated cost model used to estimate annual O&M costs for BRT and Streetcar operations:

BRT

$$\begin{array}{rcl}
 \text{Estimated} & & \text{Stations} \\
 \text{Annual} & = & \text{Unit Cost} \\
 \text{O\&M Cost} & & \text{Projected} \\
 & & \text{Route-Miles} \\
 & \times & + \\
 & & \text{Bus-Hour} \\
 & & \text{Unit Cost} \\
 & & \text{Projected} \\
 & & \text{Bus -Hours} \\
 & + & + \\
 & & \text{Bus-Mile} \\
 & & \text{Unit Cost} \\
 & & \text{Projected} \\
 & & \text{Bus -Miles} \\
 & + & + \\
 & & \text{Peak Vehicles} \\
 & & \text{Unit Cost} \\
 & & \text{Projected Peak} \\
 & & \text{Vehicles}
 \end{array}$$

Streetcar

$$\begin{array}{rcccccc}
 \text{Estimated} & & \text{Route-Mile} & & \text{Yard} & & \text{Train-Hour} & & \text{Car-Mile} & & \text{Peak Vehicles} \\
 \text{Annual} & = & \text{Unit Cost} & + & \text{Unit Cost} \\
 \text{O\&M Cost} & & \text{Projected} & & \text{Projected} & & \text{Projected} & & \text{Projected} & & \text{Projected Peak} \\
 & & \text{Route-Miles} & & \text{Garages/Yards} & & \text{Train-Hours} & & \text{Car-Miles} & & \text{Vehicles}
 \end{array}$$

O&M COST ESTIMATES

Based on the operating plans and level of service for the BRT and Streetcar operations developed for the project, O&M costs were calculated by applying unit costs derived from the fully allocated model to the projected operating statistics. An additional line item cost for Marketing/Communications was added to account for costs required for marketing and branding of the new premium service, in order to encourage patronage by existing and new transit customers. An average of 1.5% of the total estimated operating cost was applied based of review of other transit providers' marketing budget with newer BRT, Streetcar/LRT systems. Costs were estimated and summarized in current year dollars. These costs will be inflated to the projected opening year based on an annual rate of inflation to be utilized in the project's finance plan.

FY 2012 BRT Unit Costs	Stations	Bus-Hrs	Bus-Miles	Peak Vehicles	Total Annual O&M Cost	
Alternative 1 - BRT (Douglas/Dodge)	16	40,380	365,700	6		
FY 2012 Cost by Variable	\$80,000	\$1,729,832	\$680,668	\$79,313	\$2,569,813	
			Marketing/Communications		\$38,547	
			Total Annual O&M Cost (2013 Dollars)		\$2,647,486	
Alternative 2 - BRT (Farnam/Harney)	16	40,380	383,300	6		
FY 2012 Cost by Variable	\$80,000	\$1,729,832	\$713,427	\$79,313	\$2,602,572	
			Marketing/Communications		\$39,039	
			Total Annual O&M Cost (2013 Dollars)		\$2,681,234	
FY 2011 Streetcar Unit Costs	Rt-Miles	Yards	Train-Hrs	Car-Miles	Peak Vehicles	Total Annual O&M Cost
Alternative 3 - SC (Farnam/Harney)	3.3	0.80	31,740	208,100	4	
FY 2011 Cost by Variable	\$147,039	\$180,402	\$3,628,785	\$1,394,179	\$1,232,418	\$6,582,823
				Marketing/Communications		\$98,742
			Total Annual O&M Cost (2013 Dollars)			\$6,883,515



BRT Cost Allocation Model

FY2012 METRO BUS EXPENSE ALLOCATION

Expense Object	010 Vehicle Operations		041 Vehicle Maintenance		042 Non-Vehicle Maintenance		160 General Administration		Total Expenses
	Expense	Variable	Expense	Variable	Expense	Variable	Expense	Variable	
501.01 Operators Salaries/Wages	\$7,102,006	Bus-Hrs							\$7,102,006
501.02 Other Salaries/Wages	\$507,220	Bus-Hrs	\$1,983,492	Bus-Miles	\$717,308	n/a	\$538,297	Buses	\$3,746,318
502.00 Fringe Benefits	\$4,516,254	Bus-Hrs	\$1,078,073	Bus-Miles	\$423,665	n/a	\$429,112	Buses	\$6,447,104
503.00 Services	\$88,769	Bus-Hrs	\$49,955	Bus-Miles	\$527,635	n/a	\$486,688	Buses	\$1,153,047
504.01 Fuel & Lubricants	\$2,930,302	Bus-Miles	\$16,347	Bus-Miles	\$0		\$0		\$2,946,649
504.02 Tires & Tubes	\$119,705	Bus-Miles	\$1,823	Bus-Miles	\$0		\$0		\$121,528
504.99 Other Materials & Supplies	\$0		\$775,377	Bus-Miles	\$203,273	n/a	\$69,469	Buses	\$1,048,119
505.00 Utilities	\$0		\$0		\$0		\$347,498	n/a	\$347,498
506.00 Casualty/Liability	\$0		\$0		\$0		\$333,762	Bus-Miles	\$333,762
507.00 Taxes	\$0		\$0		\$0		\$0		\$0
508.00 Purchased Transportation	\$0		\$0		\$0		\$0		\$0
509.00 Miscellaneous Expenses	\$0		\$0		\$0		\$89,141	Buses	\$89,141
510.00 Expense Transfers	\$0		\$0		\$0		\$0		\$0
Total Operating Expenses:	\$15,264,255		\$3,905,068		\$1,871,882		\$2,293,967		\$23,335,171

SOURCE: Operating Expenses FY2012 Metro Report (file: Metro Cost Allocation Model Feb 6 Update.xls)

EXPENSE OBJECT	FULL ALLOCATION		
	Bus-Hrs	Bus-Miles	Peak Buses
501.01 Operators Salaries/Wages	\$7,102,006	\$0	\$0
501.02 Other Salaries/Wages	\$507,220	\$1,983,492	\$538,297
502.00 Fringe Benefits	\$4,516,254	\$1,078,073	\$429,112
503.00 Services	\$88,769	\$49,955	\$486,688
504.01 Fuel & Lubricants	\$0	\$2,946,649	\$0
504.02 Tires & Tubes	\$0	\$121,528	\$0
504.03 Other Materials & Supplies	\$0	\$775,377	\$69,469
505.00 Utilities	\$0	\$0	\$0
506.00 Casualty/Liability	\$0	\$333,762	\$0
507.00 Taxes	\$0	\$0	\$0
508.00 Purchased Transportation	\$0	\$0	\$0
509.00 Miscellaneous Expenses	\$0	\$0	\$89,141
510.00 Expense Transfers	\$0	\$0	\$0
Total Operating Expenses:	\$12,214,247	\$7,288,838	\$1,612,707
FY2012 Units of Service	285,121	3,916,046	122
Unit Cost (operating expenses only)	\$42.84	\$1.86	\$13,219



Streetcar Cost Allocation Model

FY2011 PORTLAND STREETCAR EXPENSE ALLOCATION

Expense Object	010 Vehicle Operations		041 Vehicle Maintenance		042 Non-Vehicle Maintenance		160 General Administration		Total Expenses
	Expense	Variable	Expense	Variable	Expense	Variable	Expense	Variable	
501.01 Operators Salaries/Wages	\$1,268,911	Tr-Hrs	\$0		\$0		\$0		\$1,268,911
501.02 Other Salaries/Wages	\$329,587	Tr-Hrs	\$225,265	Car-Miles	\$0	Rt.-Mi, Yards	\$441,242	Cars	\$996,094
502.00 Fringe Benefits	\$1,485,292	Tr-Hrs	\$205,785	Car-Miles	\$0	Rt.-Mi, Yards	\$451,973	Cars	\$2,143,050
503.00 Services	\$995,676	Tr-Hrs	\$538,125	Car-Miles	\$269,050	Rt.-Mi, Yards	\$1,090,164	Cars	\$2,893,015
504.01 Fuel & Lubricants	\$0		\$0		\$0		\$0		\$0
504.02 Tires & Tubes	\$0		\$0		\$0		\$0		\$0
504.99 Other Materials & Supplies	\$7,904	Cars	\$263,419	Car-Miles	\$15,573	Rt.-Mi, Yards	\$23,777	Cars	\$310,673
505.00 Utilities	\$0		\$0		\$0		\$5,035	Rt.-Mi, Yards	\$5,035
506.00 Casualty/Liability	\$0		\$15,114	Car-Miles	\$0		\$9,655	Car-Miles	\$24,769
507.00 Taxes	\$0		\$0		\$0		\$0	Yards	\$0
508.00 Purchased Transportation	\$0		\$0		\$0		\$0		\$0
509.00 Miscellaneous Expenses	\$0		\$0		\$0		\$53,578	Cars	\$53,578
510.00 Expense Transfers	\$0		\$0		\$0		\$0	Cars	\$0
Total Operating Expenses:	\$4,087,370		\$1,247,708		\$284,623		\$2,075,424		\$7,695,125

SOURCE: 2011 NTD

EXPENSE OBJECT	FULL ALLOCATION				
	Rt-Miles	Yards	Train-Hrs	Car-Miles	Peak Cars
501.01 Operators Salaries/Wages	\$0	\$0	\$1,268,911	\$0	\$0
501.02 Other Salaries/Wages	\$0	\$0	\$329,587	\$225,265	\$441,242
502.00 Fringe Benefits	\$0	\$0	\$1,485,292	\$205,785	\$451,973
503.00 Services	\$67,263	\$201,788	\$995,676	\$538,125	\$1,090,164
504.01 Fuel & Lubricants	\$0	\$0	\$0	\$0	\$0
504.02 Tires & Tubes	\$0	\$0	\$0	\$0	\$0
504.03 Other Materials & Supplies	\$3,893	\$11,680	\$0	\$263,419	\$31,681
505.00 Utilities	\$2,518	\$2,518	\$0	\$0	\$0
506.00 Casualty/Liability	\$0	\$0	\$0	\$24,769	\$0
507.00 Taxes	\$0	\$0	\$0	\$0	\$0
508.00 Purchased Transportation	\$0	\$0	\$0	\$0	\$0
509.00 Miscellaneous Expenses	\$0	\$0	\$0	\$0	\$53,578
510.00 Expense Transfers	\$0	\$0	\$0	\$0	\$0
Total Operating Expenses:	\$73,673	\$215,985	\$4,079,466	\$1,257,363	\$2,068,638
FY2011 Units of Service	8.1	1.0	35,241	199,075	7
Unit Cost (operating expenses only)	\$9,152	\$215,985	\$115.76	\$6.32	\$295,520



Streetcar Cost Allocation Model

FY2011 SEATTLE STREETCAR EXPENSE ALLOCATION

Expense Object	010 Vehicle Operations		041 Vehicle Maintenance		042 Non-Vehicle Maintenance		160 General Administration		Total Expenses
	Expense	Variable	Expense	Variable	Expense	Variable	Expense	Variable	
501.01 Operators Salaries/Wages	\$464,061	Tr-Hrs	\$0		\$0		\$0		\$464,061
501.02 Other Salaries/Wages	\$296,359	Tr-Hrs	\$173,141	Car-Miles	\$98,298	Rt.-Mi, Yards	\$244,072	Cars	\$811,870
502.00 Fringe Benefits	\$469,984	Tr-Hrs	\$117,227	Car-Miles	\$59,133	Rt.-Mi, Yards	\$132,449	Cars	\$778,793
503.00 Services	\$1,000	Tr-Hrs	\$35,642	Car-Miles	\$2,854	Rt.-Mi, Yards	\$129,102	Cars	\$168,598
504.01 Fuel & Lubricants	\$0		\$2,111	Car-Miles	\$0		\$0		\$2,111
504.02 Tires & Tubes	\$0		\$0		\$0		\$0		\$0
504.99 Other Materials & Supplies	\$1,796	Cars	\$47,522	Car-Miles	\$10,818	Rt.-Mi, Yards	\$5,446	Cars	\$65,582
505.00 Utilities	\$52,899	Car-Miles	\$0		\$0		\$0		\$52,899
506.00 Casualty/Liability	\$0		-\$3,801	Car-Miles	\$0		\$29,745	Car-Miles	\$25,944
507.00 Taxes	\$0		\$0		\$0		\$0		\$0
508.00 Purchased Transportation	\$0		\$0		\$0		\$0		\$0
509.00 Miscellaneous Expenses	\$100	Yards	\$0		\$243	Rt.-Mi, Yards	\$4,353	Cars	\$4,696
510.00 Expense Transfers	<u>\$0</u>		<u>\$0</u>		<u>\$1,169</u>	Rt.-Mi, Yards	<u>\$20,919</u>	Cars	<u>\$22,088</u>
Total Operating Expenses:	\$1,286,199		\$371,842		\$172,515		\$566,086		\$2,396,642

SOURCE: 2011 NTD

EXPENSE OBJECT	FULL ALLOCATION				
	Rt-Miles	Yards	Train-Hrs	Car-Miles	Peak Cars
501.01 Operators Salaries/Wages	\$0	\$0	\$464,061	\$0	\$0
501.02 Other Salaries/Wages	\$73,724	\$24,575	\$296,359	\$173,141	\$244,072
502.00 Fringe Benefits	\$14,783	\$44,350	\$469,984	\$117,227	\$132,449
503.00 Services	\$714	\$2,141	\$1,000	\$35,642	\$129,102
504.01 Fuel & Lubricants	\$0	\$0	\$0	\$2,111	\$0
504.02 Tires & Tubes	\$0	\$0	\$0	\$0	\$0
504.03 Other Materials & Supplies	\$2,705	\$8,114	\$0	\$47,522	\$7,242
505.00 Utilities	\$0	\$0	\$0	\$52,899	\$0
506.00 Casualty/Liability	\$0	\$0	\$0	\$25,944	\$0
507.00 Taxes	\$0	\$0	\$0	\$0	\$0
508.00 Purchased Transportation	\$0	\$0	\$0	\$0	\$0
509.00 Miscellaneous Expenses	\$182	\$161	\$0	\$0	\$4,353
510.00 Expense Transfers	<u>\$877</u>	<u>\$292</u>	<u>\$0</u>	<u>\$0</u>	<u>\$20,919</u>
Total Operating Expenses:	\$92,984	\$79,631	\$1,231,404	\$454,486	\$538,137
FY2011 Units of Service	2.7	1.0	11,508	61,726	3
Unit Cost (operating expenses only)	\$34,060	\$79,631	\$107.00	\$7.36	\$179,379

Streetcar Cost Allocation Model

FY2011 TACOMA STREETCAR EXPENSE ALLOCATION

Expense Object	010 Vehicle Operations		041 Vehicle Maintenance		042 Non-Vehicle Maintenance		160 General Administration		Total Expenses
	Expense	Variable	Expense	Variable	Expense	Variable	Expense	Variable	
501.01 Operators Salaries/Wages	\$551,170	Tr-Hrs	\$0		\$0		\$0		\$551,170
501.02 Other Salaries/Wages	\$24,398	Tr-Hrs	\$179,053	Car-Miles	\$202,784	Rt-Mi, Yards	\$51,377	Cars	\$457,612
502.00 Fringe Benefits	\$359,830	Tr-Hrs	\$111,939	Car-Miles	\$126,775	Rt-Mi, Yards	\$32,119	Cars	\$630,663
503.00 Services	\$244,822	Tr-Hrs	\$26,011	Car-Miles	\$173,961	Rt-Mi, Yards	\$52,547	Cars	\$497,341
504.01 Fuel & Lubricants	\$0		\$0		\$0		\$0		\$0
504.02 Tires & Tubes	\$0		\$0		\$0		\$0		\$0
504.99 Other Materials & Supplies	\$0		\$23,807	Car-Miles	\$46,422	Rt-Mi, Yards	\$21,169	Cars	\$91,398
505.00 Utilities	\$22,061	Car-Miles	\$0		\$0		\$128,281	Rt-Mi, Yards	\$150,342
506.00 Casualty/Liability	\$0		\$167,159	Car-Miles	\$22,500	Rt-Mi, Yards	\$0		\$189,659
507.00 Taxes	\$0		\$0		\$0		\$62	Yards	\$62
508.00 Purchased Transportation	\$0		\$0		\$0		\$0		\$0
509.00 Miscellaneous Expenses	\$0		\$0		\$0		\$7,999	Cars	\$7,999
510.00 Expense Transfers	\$0		\$0		\$0		\$733,618	Cars	\$733,618
Total Operating Expenses:	\$1,202,281		\$507,969		\$572,442		\$1,027,172		\$3,309,864

SOURCE: 2011 NTD

EXPENSE OBJECT	FULL ALLOCATION				
	Rt-Miles	Yards	Train-Hrs	Car-Miles	Peak Cars
501.01 Operators Salaries/Wages	\$0	\$0	\$551,170	\$0	\$0
501.02 Other Salaries/Wages	\$152,088	\$50,696	\$24,398	\$179,053	\$51,377
502.00 Fringe Benefits	\$31,694	\$95,081	\$359,830	\$111,939	\$32,119
503.00 Services	\$43,490	\$130,471	\$244,822	\$26,011	\$52,547
504.01 Fuel & Lubricants	\$0	\$0	\$0	\$0	\$0
504.02 Tires & Tubes	\$0	\$0	\$0	\$0	\$0
504.03 Other Materials & Supplies	\$11,606	\$34,817	\$0	\$23,807	\$21,169
505.00 Utilities	\$64,141	\$64,141	\$0	\$22,061	\$0
506.00 Casualty/Liability	\$16,875	\$5,625	\$0	\$167,159	\$0
507.00 Taxes	\$0	\$62	\$0	\$0	\$0
508.00 Purchased Transportation	\$0	\$0	\$0	\$0	\$0
509.00 Miscellaneous Expenses	\$0	\$0	\$0	\$0	\$7,999
510.00 Expense Transfers	\$0	\$0	\$0	\$0	\$733,618
Total Operating Expenses:	\$319,893	\$380,892	\$1,180,220	\$530,030	\$898,829
FY2011 Units of Service	3.6	1.0	9,817	82,563	2
Unit Cost (operating expenses only)	\$88,859	\$380,892	\$120.22	\$6.42	\$449,415