



# DRAFT

## Fort Worth Modern Streetcar

### OPERATIONS & MAINTENANCE COST ESTIMATE

AUGUST 25, 2010

#### 1.0 Introduction

One of the tasks included in HDR's scope of work is the development of a five year operating cost forecast. This memo provides an order-of-magnitude Operations and Maintenance (O&M) Cost Estimate for the six modern streetcar alignment alternatives now undergoing analysis.

#### 2.0 Methodology

The O&M cost estimate was developed using National Transit Database (NTD) information for the Seattle Streetcar and for the Fort Worth Transportation Authority. NTD data is used by many in the industry to gather statistics about other transit agencies and the services they provide. This data, once collected by the NTD, is compiled into a database that can be accessed by anyone. The NTD website is <http://www.ntdprogram.gov/ntdprogram/data.htm>.

The approach taken to estimate O&M costs for the alignments, at this early level of analysis, was to use another modern streetcar's operating cost per revenue vehicle mile (RVM) and operating cost per revenue vehicle hour (RVH) and apply those rates to the calculated RVM and RVH for each alignment. For the purposes of this analysis, Seattle streetcar cost per RVM and RVH were used as a starting point and then adjusted to account for local conditions by simply comparing the bus costs for Seattle to the bus costs for Fort Worth. That ratio (\$87.71 to \$142.61 or 61.5%) was then applied to the Seattle streetcar costs. The most updated NTD data is for 2008 and the cost per RVM for Seattle was \$19.57 and the cost per RVH was \$130.08. The adjusted cost for Fort Worth was calculated to be \$12.29 per RVM and \$80.00 per RVH. The calculated 2008 rate was inflated by 3% each year to determine the 2010 cost per RVM of \$13.04 and cost per RVH of \$84.88.

Some of the basic assumptions used to calculate the O&M costs for all alignments include:

- 15 minute headway
- 7 day service
- Span of service – 7:00 AM – 12:00 AM (17 hours)
- Speed is 6 MPH
- Spare ratio of 20%



A contingency of 15% was applied to the total calculated O&M costs category to account for any unknowns at this stage of development. This contingency and the O&M costs will be refined as the planning and development is more advanced. Adding the contingency resulted in the cost per RVM being increased from \$13.04 to \$14.99 ( $\$13.04 * 1.15 = \$14.99$ ) and the cost per RVH being increased from \$84.88 to \$97.61 ( $\$84.88 * 1.15 = \$97.61$ )

The five year cost estimate is derived by inflating the 2010 base year costs by 3%. This is a conservative estimate since the Congressional Budget Office is predicting inflation to be 2.4, 1.3 and 1.2 percent in years 2010, 2011 and beyond, respectively.

### 3.0 Results

Using the assumptions detailed above, the 2010 O&M cost estimate based on **revenue vehicle miles** for each alignment is summarized in the table below.

Alignment	2010 O&M Cost Estimate – Based on RVM			Total Cost	Cost per Revenue Vehicle Mile
	One-Way Route Miles	Number of Vehicles	Revenue Vehicle Miles		
Downtown - Jennings	2.0	4.0	99,280	\$ 1,488,542	\$ 14.99
Downtown - North Main	1.4	3.0	69,496	\$ 1,041,979	\$ 14.99
Downtown - South Main/Magnolia	3.2	5.0	158,848	\$ 2,381,667	\$ 14.99
Downtown - South Main/Rosedale	2.2	4.0	109,208	\$ 1,637,396	\$ 14.99
Downtown - Trinity Bluffs	2.2	4.0	109,208	\$ 1,637,396	\$ 14.99
Downtown - West 7th	3.0	5.0	148,920	\$ 2,232,813	\$ 14.99

The 2010 O&M cost estimate based on **revenue vehicle hours** for each alignment is summarized in the table below.

	2010 O&M Cost Estimate – Based on RVH				Total Cost	Cost per Revenue Vehicle Hour
	One-Way Route Miles	Number of Vehicles	Revenue Vehicle Hours			
Downtown - Jennings	2.0	4.0	18,615	\$ 1,816,958	\$ 97.61	
Downtown - North Main	1.4	3.0	12,410	\$ 1,211,306	\$ 97.61	
Downtown - South Main/Magnolia	3.2	5.0	24,820	\$ 2,422,611	\$ 97.61	
Downtown - South Main/Rosedale	2.2	4.0	18,615	\$ 1,816,958	\$ 97.61	
Downtown - Trinity Bluffs	2.2	4.0	18,615	\$ 1,816,958	\$ 97.61	
Downtown - West 7th	3.0	5.0	24,820	\$ 2,422,611	\$ 97.61	



As noted in the tables above, the total annual O&M costs for each alignment vary slightly depending on the variable used to calculate the costs but the variance is approximately \$200,000.

Using the 2010 O&M cost estimate as the base year, a five-year cost estimate for each alignment is summarized in the tables below.

2010-2014 O&M Cost Estimate – Based on RVM						
Alignment	2010	2011	2012	2013	2014	5 Year Total
Downtown - Jennings	\$ 1,488,542	\$1,533,198	\$1,579,194	\$1,626,570	\$1,675,367	\$ 7,902,871
Downtown - North Main	\$ 1,041,979	\$1,073,239	\$1,105,436	\$1,138,599	\$1,172,757	\$ 5,532,010
Downtown - South Main/Magnolia	\$ 2,381,667	\$2,453,117	\$2,526,711	\$2,602,512	\$2,680,587	\$12,644,594
Downtown - South Main/Rosedale	\$ 1,637,396	\$1,686,518	\$1,737,114	\$1,789,227	\$1,842,904	\$ 8,693,159
Downtown - Trinity Bluffs	\$ 1,637,396	\$1,686,518	\$1,737,114	\$1,789,227	\$1,842,904	\$ 8,693,159
Downtown - West 7th	\$ 2,232,813	\$2,299,797	\$2,368,791	\$2,439,855	\$2,513,051	\$11,854,307

2010-2014 O&M Cost Estimate – Based on RVH						
Alignment	2010	2011	2012	2013	2014	5 Year Total
Downtown - Jennings	\$ 1,816,958	\$1,871,467	\$1,927,611	\$1,985,440	\$2,045,003	\$ 9,646,479
Downtown - North Main	\$ 1,211,306	\$1,247,645	\$1,285,074	\$1,323,626	\$1,363,335	\$ 6,430,986
Downtown - South Main/Magnolia	\$ 2,422,611	\$2,495,290	\$2,570,148	\$2,647,253	\$2,726,670	\$12,861,972
Downtown - South Main/Rosedale	\$ 1,816,958	\$1,871,467	\$1,927,611	\$1,985,440	\$2,045,003	\$ 9,646,479
Downtown - Trinity Bluffs	\$ 1,816,958	\$1,871,467	\$1,927,611	\$1,985,440	\$2,045,003	\$ 9,646,479
Downtown - West 7th	\$ 2,422,611	\$2,495,290	\$2,570,148	\$2,647,253	\$2,726,670	\$12,861,972