Operations Assessment of Commuter Rail Service in FEC Miami – Ft. Lauderdale Corridor

1. Review SFRTA Operations and Maintenance Cost Data

SFRTA annual operations and maintenance (O&M) costs were compared to peer commuter rail transit systems. Peer commuter rail transit systems were selected based on age and size of the system (older commuter rail systems in New York, Boston, Philadelphia and Chicago were excluded from the peer list). The following twelve peer commuter rail systems were identified for comparison[1]:

- Portland WES
- Seattle Sound Transit
- New York ConnDot
- Baltimore MARC
- Wash. D.C. VRE
- Dallas/Ft. Worth Trinity Express
- Albuquerque Rail Runner
- Utah FrontRunner
- San Diego Coaster
- San Francisco Bay Caltrain
- Los Angeles Metrolink
- Oakland ACE

National Transit Database (NTD) data, reported annually by every public transit agency that collects federal funding, was collected and analyzed for the most recent full year reported, fiscal year 2009. Table 1 summarizes the FY 2009 NTD data for SFRTA, the thirteen peer agencies and the peer average (which includes SFRTA). The Federal Transit Administration prepares guidelines for transit agencies to report operations and financial data in a common format and with common methodologies. However, there are always some differences in how agencies report data, particularly in how they allocate operating expenses by function (Vehicle Operations, Vehicle Maintenance, Non-Vehicle Maintenance and General Administration) and Category (Operator Salary and Wages, Fringe Benefits, etc.). For example, agencies that operate more than one mode (for example, commuter rail and feeder bus) may allocate overhead expenses (administration, finance) differently among the modes. In addition, some agencies will report "Expense Transfers" that transfer operating expenses either between modes or between capital and operating budgets. Finally, it is important to note that newer transit systems (in 2009, Minneapolis' Northstar) may report operating expenses for a partial year of operations. While the overall quality of operations and financial data is good, any conclusions reached using this data alone must be tempered with appropriate judgment and caution.

1.1 Aggregate Cost Factors

First, SFRTA was compared to its national commuter rail peer systems using several cost effectiveness measures that relate the annual O&M cost to the quantity of service delivered or the amount of service consumed. For quantity of service delivered, the two most commonly used factors are annual revenue train-hours, which directly contribute to train crew costs, and

[1] Excludes Minneapolis' Northstar which was operated only part of FY 2009.

annual revenue car-miles, which directly contribute to vehicle maintenance costs and fuel consumption. For quantity of service consumed, annual passenger trips was used.

Figure 1 shows the total annual O&M cost per revenue train-hour for SFRTA and each of the peer transit systems. The SFRTA average cost was $1,702, which is about 28 percent less than the peer average, $2,377.

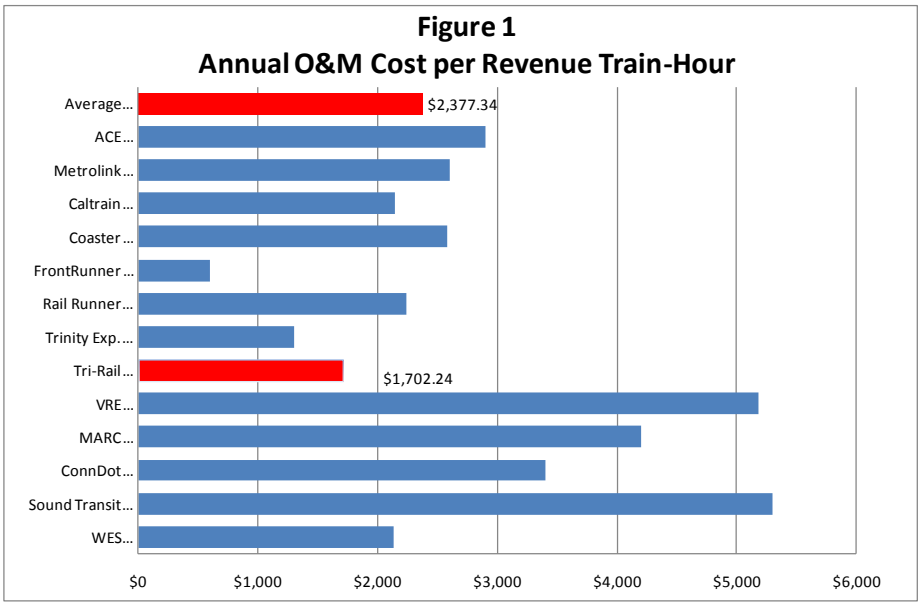
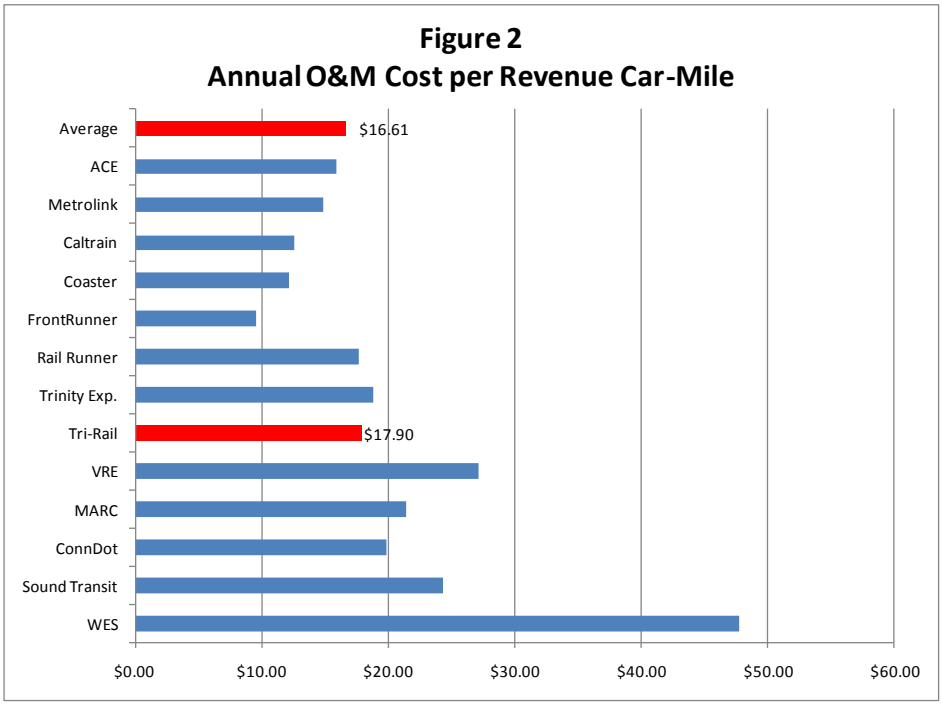
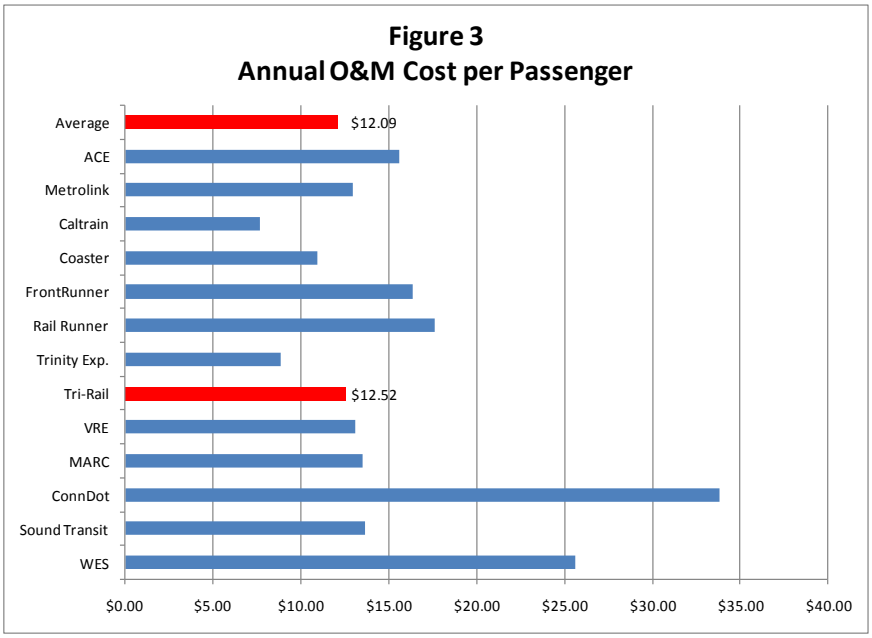


Figure 2 shows the total annual O&M cost per revenue car-mile for SFRTA and each of the peer transit systems. The SFRTA average cost was $17.90, which is about 8 percent more than the peer average, $16.61.



Finally, Figure 3 shows the total annual O&M cost per passenger trip for SFRTA and each of the peer transit systems. The SFRTA average cost was $12.52, which is about 4 percent more than the peer average, $12.09.



These aggregate cost factors indicate that SFRTA is very comparable to the peer average – more cost-effective in terms of cost per train-hour but slightly less cost-effective in terms of cost per car-mile and cost per passenger trip.

1.2 O&M Costs by Function

Examining O&M costs by function (Vehicle Operations, Vehicle Maintenance, Non-Vehicle Maintenance and General Administration) provides a more precise perspective of how SFRTA compares to its peers. (However, we must caution that the more detailed the level of analysis, the more results must be tempered by differences in reporting.)

First, SFRTA was compared to its peer systems based on the percent of its total O&M expenses for each function. Table 2 shows that SFRTA is virtually identical to its peers in the percentage of expenses that are allocated to Vehicle Operations and Vehicle Maintenance. However, SFRTA spends about 64% less on Non-Vehicle Maintenance (e.g., maintenance of track, signals and stations) but spends 27% more on General Administration costs. (Further examination of General Administration expenses in section 1.3 sheds some light on SFRTA's allocation.)

Table 2

Comparison of SFRTA and Peer Average Costs by Function

Cost Parameter	SFRTA Percent	Peer Percent	Percent Difference
Vehicle Operations	40.5%	40.2%	0.3%
Vehicle Maintenance	19.2%	19.2%	0.0%
Non-Vehicle Maintenance	4.5%	12.5%	-8.0%
General Administration	35.8%	28.1%	7.7%

Notes:

(1) Source: 2009 National Transit Database reports.

Next, unit costs were calculated for each function – Vehicle Operations Cost per Revenue Train-Hour, Vehicle Maintenance Cost per Revenue Car-Mile, Non-Vehicle Maintenance Cost per Directional Route-Mile, and General Administration Cost per Peak Passenger Car. Table 3 shows that SFRTA has significantly lower unit costs than its peers for Vehicle Operations and Non-Vehicle Maintenance. SFRTA's unit cost for Vehicle Maintenance is slightly higher than its peers, possibly because of its relatively expensive maintenance of DMUs. However, there is a marked difference in SFRTA's unit cost for General Administration, which is 152% more than its peers.

Table 3

Comparison of SFRTA and Peer Average Unit Costs

Cost Parameter	SFRTA Unit Costs	Peer Unit Costs	Percent Difference
Vehicle Operations Cost per Revenue Train-Hour	$689.97	$955.90	-28%
Vehicle Maintenance Cost per Revenue Car-Mile	$3.44	$3.19	8%
Non-Vehicle Maintenance Cost per Directional Route-Mile	$16,691.46	$30,220.25	-45%
General Administration Cost per Peak Passenger Cars	$700,196.04	$278,137.46	152%

Notes:

(1) Source: 2009 National Transit Database reports.

(2) Costs in 2009 dollars.

Finally, the Peer Average unit costs were applied to the SFRTA operating statistics to determine how much the current SFRTA service would cost based on peer unit costs. Table 4 shows a potential O&M cost savings of about $2.1M or 4% if Peer Average unit costs were applied. **Overall, this analysis indicates that SFRTA's cost basis is very similar to its Peer Agencies, albeit with some significant differences in costs allocated by Function.**

Table 4

Comparison of SFRTA Annual O&M Costs, SFRTA and Peer Average Cost Basis

Cost Parameter	SFRTA Actual	SFRTA Projected	Percent Difference
Vehicle Operations Cost	$21,430,426	$29,690,299	-28%
Vehicle Maintenance Cost	$10,161,750	$9,433,674	8%
Non-Vehicle Maintenance Cost	$2,374,193	$4,298,529	-45%
General Administration Cost	$18,905,293	$7,509,711	152%
Total Cost	$52,871,662	$50,932,213	4%

Notes:

(1) Source: 2009 National Transit Database reports.

(2) Projected costs based on SFRTA operations and Peer System unit costs.

1.3 General Administration Costs

Because SFRTA's General Administration costs displayed the most variance from its peers, some additional analysis was spent trying to better understand these costs. For this analysis, the project team examined not just NTD data but also SFRTA's "Operating Budget As Amended for Fiscal Year 2009-2010". However, it is difficult to draw precise conclusions without knowing exactly what expenses SFRTA allocates to General Administration. Table 5 shows a comparison of General Administration expenses, by Cost Category, for SFRTA and each of the Peer Agencies. SFRTA's has significantly higher expenses (total and per peak passenger car) for the categories of Other Salary and Wages, Fringe Benefits (which are directly related to Other Salary and Wages), Services, and Miscellaneous Expenses. Overall, SFRTA's FY 2009 General Administration cost was $18.9M, or about $5.7M more than the Peer Average. About $4.9M of the higher G&A cost was a result of Other Salary and Wages and Fringe Benefits.

In its FY 2009 NTD report, SFRTA reported $8.63M in General administration labor and fringe benefits costs. In its FY 2008 – 2009 Approved Budget, SFRTA estimated total labor and fringe benefits of $9.12M, a difference of just $0.47M (5.3%). SFRTA's staffing roster (FY 2009-2010 Budget, Budgeted Full-Time Equivalents) had a total of 126 FTEs budgeted for FY 2009. A review of this staffing roster indicates that the following positions should have been allocated to other functions (in fact, some of these costs may have been allocated to other functions but it appears that most were likely included in General Administration):

- Automated Fare Collection (AFC) Manager (1.0)
- AFC Senior Technician (1.0)
- AFC Technician (2.0)
- Operations Project Manager: Bus (1.0)
- Station Agent Supervisor (1.0)
- DMU Mechanic Supervisor (1.0)
- DMU Mechanic (5.0)
- Lead Ticket Agent (1.0)
- Ticket Agent (12.0)

Taken together, it is possible that SFRTA could reallocate up to 20% (25 of 126.5 FTEs) to other modes (Bus, 1.0) or other Functions. However, this number can not be stated with certainty since SFRTA's allocation of labor expenses to NTD functions is not known. Had SFRTA allocated these labor salaries and fringe benefits to other functions, SFRTA's overall cost-effectiveness (section 1.1) would remain unchanged but the allocation of costs among Functions (section 1.2) would change, resulting in a lower percent of General Administration costs.

Comparison of Commuter Rail Systems
Operating Characteristics and Costs (FY 2009)

Service and Cost Parameter	Portland WES	Seattle Sound Transit	New York ConnDot	Baltimore MARC	Wash. D.C. VRE	SFRTA Tri-Rail	Dallas Trinity Exp.	Albuquerque Rail Runner	Utah FrontRunner	San Diego Coaster	SF Bay Caltrain	Los Angeles Metrolink	Oakland ACE	Peer Average
TRS_ID:	*0008*	*0040*	*1102*	*3034*	*3073*	*4077*	*6007/6056*	*6111*	*8001*	*9030*	*9134*	*9151*	*9182*	
2009 Service Supplied														
Peak Trains in Operation	4	9	4	24	13	10	12	5	6	4	19	32	3	11.2
Peak Passenger Cars in Operation	4	44	16	109	67	27	34	19	18	20	95	141	21	47.3
Train Revenue Miles	48,096	245,790	262,282	995,171	309,925	1,067,526	418,637	318,168	749,997	257,404	1,414,274	2,472,149	126,252	668,129
Train Revenue Hours	1,484	6,419	5,899	25,938	9,769	31,060	18,700	8,518	36,270	6,366	40,653	61,015	4,284	19,721
Car Revenue Miles	66,319	1,399,687	1,012,527	5,088,471	1,866,876	2,953,182	1,292,607	1,080,290	2,249,991	1,349,238	6,895,746	10,655,753	780,192	2,822,375
Car Revenue Hours	2,057	36,010	22,769	128,890	59,257	87,315	56,156	28,289	108,810	33,348	198,204	263,307	22,680	80,546
Annual Passenger Trips	123,634	2,492,362	593,723	8,081,155	3,868,035	4,223,350	2,738,856	1,083,003	1,322,453	1,501,619	11,359,225	12,241,830	797,328	3,878,967
Directional Route Miles	29.2	146.9	101.2	400.4	161.5	142.2	72.3	193.1	87.7	82.2	153.7	777.8	172.0	193.9
# of Stations	5	10	9	42	18	18	10	10	8	8	32	55	10	18
# of Yards	1	1	1	4	2	2	1	1	1	1	1	1	1	1.4
2009 Costs														
Vehicle Operations	1,073,611	8,005,082	8,194,287	49,020,196	25,403,803	21,430,426	9,911,792	3,291,334	6,739,451	6,510,386	39,588,848	59,887,578	6,012,442	$18,851,480
Vehicle Maintenance	878,625	12,878,475	6,188,368	18,920,076	12,888,516	10,161,750	6,261,976	3,701,718	3,377,511	3,526,665	15,189,017	22,303,375	929,638	$9,015,824
Non-Vehicle Maintenance	214,364	3,487,428	2,198,304	14,903,680	2,517,070	2,374,193	2,663,045	6,927,383	6,884,022	2,747,626	6,941,580	24,303,594	-	$5,858,638
General Administration	998,685	9,649,039	3,484,057	26,291,644	9,827,818	18,905,293	5,441,375	5,136,371	4,608,651	3,655,207	25,316,174	52,269,180	5,471,042	$13,158,041
Total Costs in '09 dollars	$3,165,285	$34,020,024	$20,065,016	$109,135,596	$50,637,207	$52,871,662	$24,278,188	$19,056,806	$21,609,635	$16,439,884	$87,035,619	$158,763,727	$12,413,122	$46,883,982
Percent Vehicle Operations	33.9%	23.5%	40.8%	44.9%	50.2%	40.5%	40.8%	17.3%	31.2%	39.6%	45.5%	37.7%	48.4%	40.2%
Percent Vehicle Maintenance	27.8%	37.9%	30.8%	17.3%	25.5%	19.2%	25.8%	19.4%	15.6%	21.5%	17.5%	14.0%	7.5%	19.2%
Percent Non-Vehicle Maintenance	6.8%	10.3%	11.0%	13.7%	5.0%	4.5%	11.0%	36.4%	31.9%	16.7%	8.0%	15.3%	0.0%	12.5%
Percent General Administration	31.6%	28.4%	17.4%	24.1%	19.4%	35.8%	22.4%	27.0%	21.3%	22.2%	29.1%	32.9%	44.1%	28.1%
Productivity Calculations (2009 $)														
Cost per Revenue Train-Hour	$2,132.94	$5,299.89	$3,401.43	$4,207.56	$5,183.46	$1,702.24	$1,298.30	$2,237.24	$595.80	$2,582.45	$2,140.94	$2,602.04	$2,897.55	$2,377.34
Cost per Revenue Car-Mile	$47.73	$24.31	$19.82	$21.45	$27.12	$17.90	$18.78	$17.64	$9.60	$12.18	$12.62	$14.90	$15.91	$16.61
Cost per Passenger Trip	$25.60	$13.65	$33.80	$13.50	$13.09	$12.52	$8.86	$17.60	$16.34	$10.95	$7.66	$12.97	$15.57	$12.09
Operating Parameters														
Average Train Consist	1.0	4.9	4.0	4.5	5.2	2.7	2.8	3.8	3.0	5.0	5.0	4.4	7.0	4.2
Average Speed (mph)	32.4	38.3	44.5	38.4	31.7	34.4	22.4	37.4	20.7	40.4	34.8	40.5	29.5	33.9

Notes:

(1) Source: 2009 National Transit Database Reports

(2) Excludes Minneapolis' Northstar which operated on part of FY 2009.

Table 5

Comparison of SFRTA and Peer Average General Administration Costs

City	CR Service	NTD ID	Operator Salary & Wage	Other Salary & Wage	Fringe Benefits	Services	Fuel & Lube	Tire & Tube	Other Materials & Supplies	Utilities	Casualty & Liability	Taxes	In Report	Misc. Expenses	Expense Transfer	Total G&A Cost	G&A Cost / Peak Car
Portland	WES	0008		$20,570	$29,535	$14,520			$14,800	$50,372	$859,125			$9,632	$131	$998,685	$249,671
Seattle	Sound Transit	0040		$76,128	$42,139	$1,044,187			$31,824	$505,557	$1,038,862	$1,036,335	$3,069,754	$355,737	$2,448,516	$9,649,039	$219,296
New York	ConnDot	1102				$886,070							$2,597,987			$3,484,057	$217,754
Baltimore	MARC	3034		$601,093	$37,255	$4,460,101			$1,047,093	$991,975	$6,281,400		$12,040,048	$1,131,315	($298,636)	$26,291,644	$241,208
Wash. D.C.	VRE	3073		$2,991,470	$997,157	$3,319,170				$893,712			$792,667	$833,642		$9,827,818	$146,684
SFRTA	Tri-Rail	4077		$6,580,834	$2,052,828	$5,362,116				$790,373	$1,903,498			$2,215,644		$18,905,293	$700,196
Dallas	Trinity Exp.	6007/6056		$1,325,613	$566,047	$832,947			$224,171	$119,363	$552,331		$1,649,861	$171,042		$5,441,375	$160,040
Albuquerque	Rail Runner	6111		$1,353,132	$582,163				$118,773	$240,213	$1,302,944		$517,378	$1,021,768		$5,136,371	$270,335
Utah	FrontRunner	8001		$1,922,333	$707,437	$846,245			$234,244	$786,563	$320,873	$0		$354,211	($563,255)	$4,608,651	$256,036
San Diego	Coaster	9030		$615,788	$338,521	$427,438			$77,937	$411,165	$510,527	$0	$1,182,650	$91,181		$3,655,207	$182,760
SF Bay	Caltrain	9134		$3,054,755	$2,260,518	$5,372,790			$217,409	$1,407,993	$4,536,943		$8,465,766			$25,316,174	$266,486
Los Angeles	Metrolink	9151		$9,385,663	$7,276,131	$10,974,358			$2,209,619	$2,952,556	$14,344,658	$105,807	$3,820,845	$1,199,543		$52,269,180	$370,703
Oakland	ACE	9182		$1,415,193	$657,028	$632,173			$806,085	$141,592	$1,497,973		$187,759	$133,239		$5,471,042	$260,526
Peer Average			$0	$2,445,214	$1,295,563	$2,847,676	$0	$0	$498,196	$774,286	$3,013,558	$285,536	$3,432,472	$683,359	$396,689	$13,158,041	$278,137
Peer Average Cost per Peak Passenger C			$0	$51,687	$27,386	$60,195	$0	$0	$10,531	$16,367	$63,701	$6,036	$72,556	$14,445	$8,385	$278,137	
SFRTA Average Cost per Peak Passenger			$0	$243,735	$76,031	$198,597	$0	$0	$0	$29,273	$70,500	$0	$0	$82,061	$0	$700,196	

2. Develop Conceptual Operating Plans for FEC Miami to Ft. Lauderdale

Conceptual commuter rail operating plans were developed for the Florida East Coast Railway (FEC) between the Miami Government Center and Ft. Lauderdale Government Center. The 24.8-mile line is assumed to be double-tracked in the future (refer to SFECC Phase 2 Engineering Plans). All grade crossings are assumed to be gated and signal controlled so that commuter rail trains would not be required to stop or slow at crossings between passenger stations. The following eight stations, all at-grade, were assumed to be constructed:

- Fort Lauderdale Government Center
- Ft. Lauderdale Terminal Drive (Airport)
- Hollywood Blvd.
- Aventura (193rd – 203rd Street)
- 163rd Street
- 79th Street
- 11th Street
- Miami Government Center

2.1 Service Schedules

Service schedules for the FEC line were assumed to be identical to SFRTA's 50-train weekday schedule and 16-train Saturday, Sunday and holiday schedule. SFRTA's weekday schedules feature 20-minute service in the AM peak hour (inbound 06:00 to 07:00 leaving Mangonia Park), 20 to 30-minute service in the PM peak hour and peak shoulder periods, and 60-minute service in the midday and evening periods.

SFRTA's weekday revenue service begins about 04:00 and ends at 23:35. Weekend service begins at 06:00 and ends at 22:15. SFRTA operates every day of the year. Weekend schedules are operated on the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.

2.2 Estimated Run Times

Commuter rail run times were estimated based on typical performance characteristics for a push-pull operation. Commuter rail trains are assumed to accelerate at a maximum rate of about 2.0 miles per hour per second (mphps). Normal service braking is assumed to be a constant 2.0 mphps from 65 mph to 0 mph. Station-to-station run times also include station dwell times (30 seconds per station) and a 5% allowance for schedule margin (e.g., wheelchair boardings and alightings, dispatching delays and other unscheduled delays).

The FEC Track Chart (Florida East Coast Railway, LLC, Time Table No. 37, June 1, 2005) specifies authorized speeds of 45 mph from Fort Lauderdale to Little River junction and varying speeds of 25 mph to 45 mph south of Little River to Miami Government Center. The Phase 2 Engineering Plans would double track the entire alignment and would eliminate many existing speed restrictions. However, since several jurisdictions (e.g., Ft. Lauderdale) have enacted City Ordinances that limit the maximum speed of passenger trains to 45 mph, the run time estimates likewise assume a maximum speed of 45 mph.

The following table shows station-to-station run times.

Table 6.

Estimated Run Times: Miami Govt. Center to Fort Lauderdale Govt. Center								
	Speed (mph)		Distance (miles)			Run Time	Dwell Time	Total Time
Station	Authorized	Actual	Station	Increment	Total	(hr:min:sec)	(hr:min:sec)	(hr:min:sec)
Fort Lauderdale Govt. Center			18002.50		0.00		00:00:30	00:00:00
	45	45		3.55		00:05:27		
Ft. Lauderdale Airport			18190.00		3.55		00:00:30	00:05:57
	45	45		4.27		00:06:26		
Hollywood Blvd.			18415.50		7.82		00:00:30	00:12:53
	45	45		3.93		00:05:58		
Aventura			18623.00		11.75		00:00:30	00:19:21
	45	45		2.05		00:03:20		
163rd Street			18731.00		13.80		00:00:30	00:23:11
	45	45		5.92		00:08:45		
79th Street			19043.50		19.72		00:00:30	00:32:26
	45	45		4.44		00:06:41		
11th Street			19278.00		24.16		00:00:30	00:39:37
	45	45		0.63		00:01:22		
Miami Govt. Center			19311.50		24.79		00:00:30	00:41:28
TOTAL					**24.79**	**00:37:59**	**00:04:00**	**00:41:28**
						Avg. Speed =	**35.9**	**mph**
NOTES:								
1. Station-to-station distances based on South Florida East Corridor Rail Plans, prepared by Gannett Fleming.								
2. Run times based on acceleration & deceleration rates for MP-36PH-3C locomotive + 2 coach cars (per Systra Consulting, Sept. 19, 2008).								
3. Run times include 5.0% allowance for passenger comfort, dispatching delays, ADA compliance.								
4. Authorized speeds were assumed to be controlled by civil restriction in each jurisdiction (45 mph maximum speed).								

2.3 Estimated Operating Requirements

Cycle times are important for determining the operating requirements. Cycle times consist of in-vehicle running time, station dwells, intersection and grade crossing delays, and layover and schedule recovery time. The minimum cycle time is calculated by multiplying the one-way run time by two (round-trip) and adding a minimum 15 minutes layover / schedule recovery time at each terminal. When developing preliminary schedules, the layover / schedule recovery time at each terminal was adjusted until the cycle time was an integer multiple of the service frequency (i.e., SFRTA/FEC can't operate fractions of trains). The estimated 41.5-minute one-way run time results in a round-trip cycle time of 120 minutes, including 18.5 minutes of layover / schedule recovery time at each terminal.

The weekday 50-train schedules would require 5 peak trainsets. Since ridership projections for the FEC line have not yet been developed, a three-car train consist was assumed, similar to SFRTA weekday peak period operations: one locomotive, two passenger coaches, and one cab car. The following table shows estimated operating requirements for the FEC line.

Table 7.

FEC Line - 50 Train Schedule - Miami Govt Center to Ft. Lauderdale Govt Center

From	To	Day	Run Time (min)	Distance (miles)	---Headway--- Peak	Off-Peak	---Train Consist--- Peak	Off-Peak	----Annual Revenue---- Car-Miles	Tr-Hours
Miami Govt. Center	Ft. Lauderdale Govt. Center	Weekdays	41.5	24.8	20	60	3	3	337,300 599,700	3,780 8,060
		Saturdays	39.4	24.8	120		3		60,700	820
		Sundays	39.4	24.8	120		3		66,600	900

Annual Revenue Vehicle-Hours =	**13,560**
Annual Revenue Vehicle-Miles =	**1,064,300**
Peak Trainsets =	**5**
Peak Passenger Cars =	**15**

NOTES:

(1) One-way distance based on Phase 2 design plans.

(2) One-way station-to-station run times estimated by HDR based on Phase 2 design plans, eight stations, and MP locomotive performance characteristics.

(3) Operating hours are approximately 04:00 to 23:00 Monday - Friday, 06:00 to 22:00 Saturday - Sunday; similar to existing SFRTA schedules (June 2011).

(4) Train consist includes 1 locomotive, 2 passenger coaches and 1 passenger cab car.

(5) Annual revenue bus-miles and bus-hours include layover time, but do not include report and deadhead time.

(6) Annual operating requirements based on 252 weekdays, 51 Saturdays, and 56 Sundays and holidays per year.

(7) Peak headway (20 minutes) operated for AM and PM peak hours only. Schedules are assumed to be similar to SFRTA existing schedules (June 2011).

3. Estimated Annual Operations and Maintenance Costs for FEC Miami to Ft. Lauderdale

Annual operations and maintenance (O&M) costs were estimated for the 24.8-mile FEC line between Miami and Ft. Lauderdale using two sets of unit costs derived from the 2009 NTD data. The first set of unit costs was derived specifically for SFRTA based on their 2009 NTD data. The second set was derived from the average of the 14 peer commuter rail transit systems. Annual O&M costs were based on four unit costs calculated for each of the four NTD functions: (1) Vehicle Operations cost per annual revenue train-hours, (2) Vehicle Maintenance costs per annual revenue car-miles, (3) Non-Vehicle Maintenance costs per directional route-mile, and (4) General Administration costs per peak passenger car.

The SFRTA and Peer Average unit costs and FEC cost estimates are shown Table 8. The Peer Average unit costs resulted in 11% lower annual O&M costs for the FEC line than the SFRTA unit costs. In 2009 dollars, the FEC line would cost about $22.03M (Peer) to $24.35M (SFRTA); in 2011 dollars, the FEC line would cost about $23.37M (Peer) to $25.83M (SFRTA) to operate. The annual O&M cost estimates DO include all vehicle operations (including dispatching), vehicle maintenance, facilities maintenance, fuel, insurance, and general administration costs necessary to manage, operate and maintain the proposed service. The annual O&M cost estimates DO NOT include the cost to purchase the right-of-way, other major capital equipment of facility acquisitions or improvements, FEC access agreements, or track and signal maintenance north of the Ft. Lauderdale station. Actual O&M costs will vary depending on governance (the agency responsible for operating the system); use of private contractors (either turnkey or for selected functions); competitiveness of the private contracting market; inability to complete the Phase 2 Engineering Plans; variances in fuel, labor or insurance costs; and differences in the schedules and estimated run times and operating plans.

Table 8.

Estimated Commuter Rail Annual Operating and Maintenance (O&M) Costs
FEC Line - 50 Train Schedule - Miami Govt Center to Ft. Lauderdale Govt Center

Service Parameter	Units	O&M Cost Based on SFRTA		O&M Cost Based on Peer Systems		Percent Difference SFRTA vs. Peers
		SFRTA Unit Cost	Annual O&M Cost (2009 $)	Peer Unit Cost	Annual O&M Cost (2009 $)	
Annual Rev. Train-Hours	13,560	$689.97	$9,356,000	$955.90	$12,962,000	-28%
Annual Rev. Car-Miles	1,064,300	$3.44	$3,662,000	$3.19	$3,400,000	8%
Dir. Route Miles	49.58	$16,691	$828,000	$30,220	$1,498,000	-45%
Peak Passenger Cars	15	$700,196	$10,503,000	$278,137	$4,172,000	152%
Annual O&M Cost (2009 $)			$24,349,000		$22,032,000	11%
Annual O&M Cost (2011 $)			$25,832,000		$23,374,000	11%

Notes:
(1) FEC Service units based on 50-train weekday scheudle.
(2) SFRTA and Peer System unit costs based on 2009 National Transit Database reports.
(3) 2011 costs inflated by 3.0% per year.