

**Volume 2**  
**Appendix D**  
**Automated People Mover**  
**Operating Plan and**  
**Operating Cost Estimates**

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**2020 Vision**  
Fort Lauderdale - Hollywood International Airport

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## EXECUTIVE SUMMARY

The following analysis was completed for the purpose of estimating Automated People Mover (APM) operating requirements (i.e., vehicles required, annual vehicle miles and hours), and annual Operating and Maintenance (O&M) costs.

This analysis begins with a review of the following three alignments: On-Airport Only, Airport to Mid-Port via the Intermodal Center (IMC) located adjacent to the Airport, and Airport to North Port, again via the IMC. Travel time estimates were prepared which included accommodation for passenger boarding time and were based on typical APM performance criteria. From these three alignments, four Alternative Operating Concepts were developed and used later in examining potential phasing options for these alignments. These alternatives include: 1) APM service at Airport only from Terminal 4 to the RAC, 2) APM service at Airport plus service to Mid-Port Station #2 (serving the IMC), 3) APM service at Airport plus service to North Port (serving the IMC), and 4) APM service at Airport plus service to both Mid-Port and North Port. Using Preliminary Year 2020 ridership projections, peak APM vehicles per train and frequency of service was established for each Alternative Operating Concept.

As part of this study effort an O&M Cost Model was developed. This model is structured in resource build-up format, in which a series of line items represent specific labor or non-labor costs. Each line item is linked either directly or indirectly to an input variable that reflects level of service or some other system attribute. *Direct* links are expenses that are logically and strongly influenced by one of the input variables. The Airport-Port Everglades APM model calculates operating expenses using actual Year 2000 productivity factors and consumption rates reported by Miami-Dade Transit for its Metromover system, and the Jacksonville Transportation Authority for its Skyway system. Because consumption, productivity and cost data are not readily available from private sector operators, as this information generally is considered proprietary, costs estimates reflect costs more typical of a publicly operated system. To compensate to efficiencies typical of privately contracted APM service, a range of annual O&M costs have been estimated for each Alternative Phasing Plan (private operation est. 15% lower).

The following table summarizes the peak APM vehicle requirements and annual O&M Costs (low end private operation) for two phasing scenarios (Airport to Mid Port first then to North Port and Airport to North Port first then to Mid-Port).

### Phasing Alternative A

Cost Centers	Phase 1 Airport Only	Phase 2 Airport to Mid Port	Phase 3 Airport to Mid Port and North Port
Peak/Fleet Vehicles	6 / 8	72 / 78	96 / 108
Total Employees	33	76	95
Total Annual O&M Costs	\$ 3.37 – \$ 3.96 million	\$ 10.59 - \$ 12.46 million	\$ 14.09 - \$ 16.58 million

**Phasing Alternative B**

Cost Centers	Phase 1 Airport Only	Phase 2 Airport to North Port	Phase 3 Airport to North Port and Mid Port
Peak/Fleet Vehicles	6 / 8	64 / 72	96 / 108
Total Employees	33	74	95
Total Annual O&M Costs	\$ 3.37 – \$ 3.96 million	\$ 10.34 - \$ 12.16 million	\$ 14.09 - \$ 16.58 million

# 1.0 Alternative Operating Plan Concepts

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## 1.1 Alternative Alignments

### On-Airport Alignment

The on-airport APM alignment will consist of an elevated guideway structure that will be routed within a corridor between the parking garages and the double-decked terminal roadways. One APM station per terminal will provide adequate levels of service for the forecasted ridership demand (described further in section 1.3.2). The APM guideway structure will span over the proposed new pedestrian bridges with escalators and elevators providing connections to/from the terminals and parking garages via the pedestrian bridges

### Off-Airport Alignments

The off-airport APM alignment would begin just beyond the RAC station and proceed to the Intermodal Center (IMC), and points beyond. The off-airport alignment follows public roads and rights-of-way prior to entering Port property. Two alignment origins/destinations have been identified for the off-airport alignment: Mid-Port and North Port. Each of these Port Alignments follow the same path from the IMC, north along the east side of the access ramps from Federal Highway (US 1) to I-595, serving a station located near the “Centralized Cruise Passenger Transfer Facility (CCPT)”. Just north of this facility, access to Mid-Port and North Port require the following APM alignments:

***Mid-Port Alignment*** – The Mid-Port alignment proceeds east along the south side of Elder Drive. The alignment to Mid-Port is essentially fixed when considering container yard operations and the other planned facilities at Mid-Port. The first Mid-Port station will be located across from Cruise Terminals 26 and 29, consistent with the Port’s Master Plan. The second station would be located in the center of five planned cruise terminals (numbers 21 to 25). Service plans identified below are based on full implementation of the Mid-Port Alignment to the second Mid-Port Station (#2).

***North Port Alignment*** – The alignment to North Port currently has three options. The alignment could proceed north up either Eisenhower Boulevard, SE 14<sup>th</sup> Avenue or up a Port-owned railroad right-of-way. All alignments would terminate with two elevated stations serving the North Port cruise facilities and the Convention Center. The Eisenhower alignment via Terminal 18 station has been chosen for purposes of operating plan development and operating cost estimation.

Implementing the entire system (both Mid-Port and North Port Alignments) would be ideal, however, funding and cash flow constraints may dictate that the “off-airport”

system be built in phases. Service operating plans for various phasing concepts have been developed and presented further in section 3.

## **1.2 Alternative Operating Concepts**

Based on the alternative alignments identified above, four alternative operating plan concepts have been developed to be used later in operating plan development and phasing plan options. These four operating plan concepts include the following:

*Alternative Operating Concept #1* – APM service on-airport only between Terminal 4 station and the RAC / Terminal 1 station, with intermediate stations located at Terminal 2 and 3.

*Alternative Operating Concept #2* – APM service from Terminal 4 station (at airport) to Mid-Port station #2, also serving stations at the IMC, CCPT and Mid-Port station #1.

*Alternative Operating Concept #3* – APM service from Terminal 4 station (at airport) to North Port station #2, also serving stations at the IMC, CCPT, Terminal 18 and North Port station #1.

*Alternative Operating Concept #4* – This concept combines both Concept #2 and #3, providing APM service from Terminal 4 station (at Airport) to both Mid-Port and North Port. This concept has been referred to as the Ultimate System.

## **1.3 Operating Plan Development Assumptions**

### **1.3.1 Estimated Cycle Times**

A prerequisite to developing an APM operating plan is the calculation of travel time estimates. Below is a description of the key assumptions used to develop the APM travel times for the Airport to Port APM System.

#### **Vehicle Performance and Speed Assumptions**

Alignment travel times were calculated using an initial acceleration rate of 1.75 mphps (miles per hour per second) between 0 and 25 mph. Once the APM has reached 25 mph, the acceleration rate begins to decline. The normal service-braking rate used for routine stopping at passenger stations is assumed to be 1.50 mphps. These performance characteristics are slightly slower than manufacturer suggested performance for typical APM's to ensure airport APM type quality of service (i.e., safety - smooth acceleration/deceleration for standing passengers with luggage)

## Station-to-Station Travel Time Estimates

Station-to-station travel times have been calculated using a computer model calibrated with performance characteristics for a typical Automated People Mover (APM) vehicle (adjusted). Detailed alignment data, including station locations, horizontal curves were input into the model using the alignments identified above. Travel time estimates take into consideration maximum allowable speeds through alignment curves. Three alternative travel time estimates were prepared based on the following three alignments (see Appendix A for detail travel time estimates):

- **On Airport** - Terminal 4 station to the RAC / Terminal 1 station, with intermediate stations located at Terminal 2 and 3.
- **Airport to Mid-Port** - Terminal 4 station (at airport) to Mid-Port station #2, also serving stations at the IMC, CCPT and Mid-Port station #1.
- **Airport to North Port** - Terminal 4 station (at airport) to North Port station #2, also serving stations at the IMC, CCPT, Terminal 18 and North Port station #1.

## Dwell Time at Stations

Travel time estimates for the three alignments noted above assume all trains stop at all stations on the line. Station dwell times are determined either based on projected or actual boarding and deboarding passenger rates or based on system policy. Generally, station dwell times, for each alignment station are 40 seconds. This amount of dwell time was determined to be sufficient to board and deboard typical station passenger volumes. Actual station dwell times will vary by station and time of day; from as little as 5-10 seconds at stations with few waiting passengers to 40 seconds or more for heavily patronized stations. Once more refined passenger volume estimates are determined, shift in dwell times may be required from low passenger volume stations to high passenger volume stations. In addition to the base 40 second dwell assumed at stations, additional dwell time has been assumed at key stations to accommodate automated system changes and higher passenger volumes (i.e., end of line stations, IMC, Terminal 4 station).

## Cycle Times

Generally, cycle times include additional time allocated at the end-of-line stations to accommodate vehicle operator rest/schedule recovery time. Because this system is automated (no vehicle operators) this additional time at end-of-line stations can be reduced significantly if not eliminated all together. Some automated system functions will be performed at the end of line stations, however these functions can be performed while APMs are at the station platforms boarding and deboarding passengers. Elimination of additional end-of-line operator rest/schedule recovery time reduces the overall roundtrip cycle time, resulting in reduced vehicle and operating requirements. Cycle times for this projects alternative alignments have been determined based on estimated travel times plus some minimal additional dwell time (seconds) at end-of-line stations to create a roundtrip cycle time divisible by the desired service headway for that alternative

alignment. Service headways have been determined based on ridership projections and APM consist size (number of APM cars per train set).

### 1.3.2 Ridership Projections

Preliminary year 2020 ridership projections have been forecasted for each of the Alternative Operating Concepts listed above. Table 1 identifies estimated daily peak hour peak direction ridership for each alternative. Peak hour ridership demands are used to determine headway assumptions and APM train consist sizing (described further below).

**Table 1  
2020 Ridership Demand\*  
By Alternative**

Alternative	Peak Hour Ridership Demand
<b>Alternative 1 – On-Airport only</b>	<b>1,051</b>
<b>Alternative 2 – Airport to Mid-Port</b>	<b>4,992</b>
<b>Alternative 3 – Airport to North Port</b>	<b>3,621</b>
<b>Alternative 4 – Airport to Mid-Port and North Port (Ultimate System)</b>	<b>8,320</b>

\*Leigh Fisher and Associates - Preliminary 2020 ridership projections, *Project Definition Report, October 2002.*

### 1.3.3 APM Load Standards

The Airport – Port APM System operating plans assume the use of a typical APM vehicle with a maximum passenger carrying capacity between 80 and 100 passengers per vehicle. However, actual experience on these systems at other airports places this figure closer to 70 passengers per vehicle. For the purpose operating plan development, 70 passengers per vehicle (one car) are assumed.

### 1.3.4 APM Consist Sizing and Headway Assumptions

Using the ridership projections developed for the APM Alignments, peak hour peak direction (PHPD) ridership volumes were analyzed to determine appropriate operating frequencies and APM car consists to meet the ridership demand. APM train sets have been sized and service frequencies identified to provide peak hour peak direction ridership capacity exceeding projected peak hour peak direction ridership demands. Table 2 below identifies APM consist size and headway assumptions for each APM Alignment.

**Table 2  
APM Consist Size and Headway Assumptions**

<b>Alternative</b>	<b>Projected PHPD Rider Demand</b>	<b>APM Train Consist Size (cars/train)</b>	<b>Headway Assumption (minutes)</b>	<b>Rider Capacity Supplied</b>
1. Airport Only	1,051	2	5	1,680
2. Airport to Mid Port	4,992	3	2	6,300
3. Airport to North Port	3,621	4	3	5,600
4. Airport to Mid Port & North Port	8,320	4	2 to 4 min. to Mid Port, and 6 min to North Port	8,400

1. Airport Only: 2-car trains @ 140 passengers/train @ 5 minute headways (12 trains/hour) = 1,680 passengers
2. Airport to Mid Port: 3-car trains @ 210 passengers/train @ 2 minute headways (30 trains/hour) = 6,300 passengers
3. Airport to north Port: 4-car trains @ 280 passengers/train @ 3 minute headways (20 trains/hour) = 5,600 passengers
4. Airport to Mid Port and North Port: Mid Port Line – 4-car trains @ 280 passengers/train @ 2 to 4 minute headways (i.e., two Mid Port trains for every North Port Train or two 6 min lines – 20 trains/hour) - 5,600 passengers, plus North Port Line - 4-car trains @ 280 passengers/train @ 6 minute headways (10 trains/hour) – 2,800 passengers, both lines combined result in 2 minute headways on common trunk portion of alignments and a passenger capacity of 8,400 passengers.

### **1.3.5 Hours of Operation**

The On-Airport segment of the Ft. Lauderdale Airport-Port Everglades APM system will operate in service seven days a week. APM service to Port Everglades will operate limited service to meet Cruise Ship passenger demands (service days and hours delineated below). Special service may be augmented (using vehicle spare fleet) for special events / peak cruise departure/arrival days. Service frequencies will vary by time period. Weekday, Saturday and Sunday operating periods are defined as follows.

On-Airport Service Only:

Weekday

Early Morning

4:00 to 6:30 a.m.

Base Period

6:30 a.m. to 10:00 p.m.

Evening

10:00 p.m. to 1:00 a.m.

Weekends

Early Morning 4:00 to 6:30 a.m.  
Base Period 6:30 a.m. to 10:00 p.m.  
Evening 10:00 p.m. to 1:00 a.m.

Port Everglades Service:

Monday – Wednesday  
No Service

Thursday – Friday  
Base Period 8:00 a.m. to 6:00 p.m.

Weekends  
Base Period 8:00 a.m. to 1:00 p.m.  
Afternoon Period 1:00 p.m. to 6:00 p.m.

**1.4 Alternative Operating Plans**

APM operating plans have been developed based on the operating concepts identified in section 1.2. Table 3 below provides a summary of the operating requirements of each of these operating plans. Following is a discussion of operating requirements using two phasing approaches. Appendix B contains a more detail depiction of these plans, identifying operating patterns of each alternative, pattern distance and estimated travel time, train consist sizing and headways (based on projected ridership estimates), daily and annual one-way trips, and APM car miles and hours.

**Table 3  
Alternative Operating Plan Requirements**

Operating Plan	Peak Service Headway (minutes)	Vehicle Requirements		Annual One-Way Trips	Annual Car-Miles	Annual Car-Hours
		Peak	Fleet			
Airport Only	5	6	8	183,960	239,150	45,990
Airport to Mid Port	2	72	78	470,840*	1,630,590	226,700
Airport to North Port	3	64	72	334,640*	1,599,620	208,980
Airport to Mid Port and North Port	2 (6 min to North Port and 2 – 4 min to Mid Port)	96	108	524,670*	2,428,480	320,810

Note: One-way trips include one-way trips between Airport Terminals and the IMC, plus one-way trips between the IMC and Mid Port or North Port (or both).

## Operating Plan Phasing Alternatives

Implementing the entire APM system, connecting the Airport to both Mid Port and North, would be ideal, however funding and cash flow constraints may dictate the “off-airport” system be built in phases. In order to analyze operating requirements and O&M costs, two alternative phasing approaches have been identified. Each of these phasing approaches begin with the implementation of the Airport only segment, operating APM service between Terminal 4 and the RAC, and end with the implementation of the full system serving both the Mid Port and North Port APM lines. The phasing difference between these two approaches occurs in which extension line from the Airport to Port Everglades occurs first in the phasing in of APM service. Alternative Phasing Approaches are identified below:

### Alternative A

- Build and Operate On-airport segment first
- Extend On-airport segment to Mid Port next
- Add extension to North Port last

### Alternative B

- Build and Operate On-airport segment first
- Extend On-airport segment to North Port next
- Add extension to Mid Port last

Table 4 below identifies operating requirements for each alternative phasing approach. Each of the phasing approaches reflect implementation of the On-Airport segment first, then adding either the North Port or Mid Port segment next, followed by implementation of the full system (Ultimate System), serving both North Port and Mid Port.

**Table 4  
Operating Requirements for Phased Service Plans**

#### **Alternative A – Airport, then Mid Port first, then North Port**

<b>Operating Characteristics / Requirements</b>	<b>On-Airport Only</b>	<b>Airport to Mid Port</b>	<b>Airport to Mid Port and North Port</b>
Peak Service Headway (min)	5	2	2
Peak APM Cars	6	72	96
Fleet APM Cars	8	78	108
Annual One-Way Trips	183,960	470,840	524,670
Annual Car-Miles	239,150	1,630,590	2,428,480
Annual Car-Hours	45,990	226,700	320,810

**Alternative B – Airport, then North Port first, then Mid Port**

<b>Operating Characteristics / Requirements</b>	<b>On-Airport Only</b>	<b>Airport to North Port</b>	<b>Airport to Mid Port and North Port</b>
Peak Service Headway (min)	5	3	2
Peak APM Cars	6	64	96
Fleet APM Cars	8	72	108
Annual One-Way Trips	183,960	334,640	524,670
Annual Car-Miles	239,150	1,599,620	2,428,480
Annual Car-Hours	45,990	208,980	320,810

## 2.0 O&M Cost Methodology

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### 2.1 General Model Description

The model is structured in resource build-up format, in which a series of line items represent specific labor or non-labor costs. Each line item is linked either directly or indirectly to an input variable that reflects level of service or some other system attribute. *Direct* links are expenses that are logically and strongly influenced by one of the input variables. For instance, the model assumes that the cost of traction power depends upon the number of car-miles operated. *Indirect* links are expenses that depend upon prior direct links. For example, the amount of Vehicle Operations fringe benefits is a function of Vehicle Operations wages, which are directly linked to the number of hours vehicles are in revenue service. In these examples, car-miles are assumed to directly “drive” the cost of traction power, car-hours are assumed to directly “drive” Vehicle Operations wages, and the amount of Vehicle Operations fringe benefits are calculated as a percentage of that department’s payroll.

The Airport-Port Everglades APM model calculates operating expenses using actual Year 2000 productivity factors and consumption rates reported by Miami-Dade Transit for its Metromover system, and the Jacksonville Transportation Authority for its Skyway system (consumption, productivity and cost data are not readily available from private sector operators as this information generally is considered proprietary). It implicitly is assumed that these base year rates of consumption and productivity represent an “out-of-warranty” system operated by a public transit provider and that such consumption rates and productivity levels will continue into the future. Modeled Metromover and Skyway costs have been inflated by 2 percent annually to represent current year (2002) dollars.

The APM cost model consists of two interactive tables in a Microsoft Excel spreadsheet:

- Table 1 – Input Statistics
- Table 2 – Line Item Detail

### 2.2 Input Variables

The model uses six variables as the defining parameters of an automated people mover system. Each variable is described briefly in the left column of the following table. Corresponding values reported for the Miami and Jacksonville APM systems are shown to the right as points of reference. The operating statistics were obtained from each system’s *National Transit Database* report for FY 2000.

**Table 5**  
**Automated People Mover O&M Cost Model Inputs**

	<b>Miami</b>	<b>Jacksonville</b>	<b>Average</b>
<b>Peak Cars</b> Maximum number of APM cars in service at the same time.	15	6	11
<b>Annual Revenue Car-Miles</b> Total miles traveled by all APM cars in revenue service over a 12-month period. (Annual revenue car-miles excludes deadhead mileage.)	986,500	203,200	594,900
<b>Annual Revenue Car-Hours</b> Total APM car-hours operated in revenue service over a 12-month period. (Annual revenue train-hours excludes deadhead time.)	90,600	18,500	54,600
<b>Passenger Stations</b> The number of APM passenger stations in the system.	21	6	14
<b>Directional Route-Miles</b> The number of miles of revenue track. One route-mile of double track equals two directional route-miles.	8.5	4.3	6.4
<b>Maintenance Facilities</b> The number of railcar service, maintenance and storage facilities.	1	1	1

A similar set of values must be estimated for each study scenario based on proposed operating plans.

### **2.3 Labor Costs**

The cost model assumes the same four functional areas that are used by public agencies to report to the National Transit Database – Vehicle Operations, Vehicle Maintenance, Facilities Maintenance and Administration & Support. Staffing levels were estimated with data provided by Miami-Dade Transit and the Jacksonville Transportation Authority (JTA). The model combines staffing information reported in the agencies’ respective *National Transit Database* reports with information obtained through recent telephone interviews. Because of the geographic proximity of the Miami area to Ft. Lauderdale, and the relatively large scale of the study project’s scope, the O&M cost model incorporated more of Miami-Dade Transit’s staffing information than that of Jacksonville Transportation Authority. JTA’s data was used primarily as a reference for reasonableness.

The model assumes the following labor classifications:

## **Vehicle Operations**

- Operations Manager
- Administrative Assistant
- Control Center Supervisor
- Trainer
- Controller

## **Vehicle Maintenance**

- Vehicle Maintenance Manager
- Administrative Assistant
- Clerk
- Vehicle Maintenance Supervisor
- Rail Vehicle Technician
- Rail Vehicle Cleaner

## **Facilities Maintenance**

- Chief Supervisor, Power & Signals
- Traction Power Supervisor
- Traction Power Technician
- Train Control/Signals Supervisor
- Train Control/Signals Technician
  
- Chief Supervisor, Track & Structures
- Track & Structures Supervisor
- Track & Structures Technician
- Building & Grounds Supervisor
- Serviceperson

## **Administration & Support**

- General Manager/Superintendent
- Accountant
- Safety/Risk Management Specialist
- Administrative Assistant
- Reception/Telephone Operator

Brief functional descriptions for modeled positions are included in Appendix B to this report.

Annual earnings for each modeled position were estimated using comparable job classifications at Lynx in Orlando and MARTA in Atlanta. Labor rate assumptions were

adjusted as described at the end of Section 2.5 as part of the process of testing model results using Miami's Metromover system.

The model's labor costs also provide for overtime for the line positions in the operating and maintenance areas, and fringe benefits for all functional areas. Fringe benefits were assumed to be 55.6 percent of earnings, which is the rate Miami-Dade reported in their recent 2000 *National Transit Database* report

## **2.4 Non-Labor Costs**

The model estimates non-labor expenses in a similar manner as labor costs using National Transit Database functional areas and cost types. Cost types modeled include Contract Services, Materials & Supplies, Utilities, Insurance and Miscellaneous. For its baseline unit costs, the model uses reported year 2000 data for Miami-Dade Transit and Jacksonville Transportation Authority's automated guideway systems, inflated by 2 percent annually to represent current year (2002) dollars.

The model further allocates non-labor expenses and uses unit costs for selected non-labor expense categories based on the following assumptions:

- Total reported costs for Vehicle Operations contract services were assumed to be for system security and were allocated to "post" (guard duty), driven by the number of stations. System security at on-airport stations are assumed to be covered by existing Airport Security personnel.
- Half of reported insurance costs were assumed to relate to liability arising from providing passenger service (modeled in terms of revenue car-miles); the remainder was assumed related to the physical extent of the system (in terms of route-miles, covering liability related to track, structures, bridges, signals, traction power, etc.).
- Half of reported non-propulsion utilities costs were assumed to relate to stations (for lighting, water, telephone, elevator/escalator operation) and half was assumed for the requirements of the maintenance shop.

## **2.5 Line Item Detail**

The Line Item Detail is where the model combines labor and other expenses, identifies the system variable selected as driving each expense, contains unit cost and productivity assumptions and equations, and estimates the annual cost and staffing level required to operate a specific automated guideway system scenario. Costs are itemized within the functional areas of Vehicle Operations, Vehicle Maintenance, Facilities Maintenance and Administration & Support. Within each functional area labor items are listed first (Wages, Overtime, Fringe Benefits), followed by non-labor expenses (Contract Services, Materials & Supplies, Utilities, Insurance, Miscellaneous).

Staffing requirements are estimated as the total headcount for each functional area, based upon labor productivity information provided by Miami-Dade Transit and the Jacksonville Transportation Authority.

A sample printout of the model's Line Item Detail follows (Table 6). This example shows how the model estimated the annual cost to operate and maintain Miami-Dade's year 2000 Metromover system in current year dollars.

This example represents the testing phase of model development, when hybrid unit cost, consumption and productivity assumptions designed for a specific project are applied to an existing system, for which we have actual cost data. Testing the Airport-Port Everglades automated people mover cost model required a few adjustments in order to reconcile some differences in information received. The adjustments included increasing assumed salaries/wages in Vehicle Operations and Vehicle Maintenance to more closely reflect the average annual labor cost per person reported in Miami-Dade's *National Transit Database report*, and to add a line item for General/Administrative Overhead Support (15 percent of the estimated cost for operations and maintenance) to account for about two dozen reported staff elsewhere in the Miami-Dade Transit organization who support Metromover indirectly. These people would represent such functions as Human Resources, Finance, Planning/Scheduling, Marketing/Customer Service, Audit and Legal.

The end result of the testing phase is that the Airport-Port Everglades automated people mover model accounts for 84 percent of Miami Metromover's annual O&M cost. As the model is a hybrid, we are confident that it does a credible job of balancing reasonable estimates of either public or private operation of the study alternatives.

**Table 6**  
**O&M Model Line Item Detail**  
**(Sample: Metromover System Test Case)**

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b>Vehicle Operations</b>							
Operations Manager	100	LABOR	\$88,800	Fixed		1.0	\$88,800
Administrative Assistant	100	LABOR	\$40,000	Fixed		1.0	\$40,000
Control Center Supervisor	100	LABOR	\$63,600	Fixed		1.0	\$63,600
Trainer	100	LABOR	\$60,000	Fixed		1.0	\$60,000
Controller	100	LABOR	\$56,400	Fixed	Sys operating plan*	8.3	\$467,864
Overtime	100	LABOR		10.0%	Controller wages		\$46,786
Fringe Benefits	100	LABOR		55.6%	Wages & Salaries		\$426,173
Contract Security; Post	100	SERV		\$33,000	STATION		\$561,000
Other Contract Services	100	SERV		\$1.00	CARHR		\$90,637
Materials & Supplies	100	MATL		\$500	Dept. Employee		\$6,148
Miscellaneous	100	MISC		\$200	Dept. Employee		\$2,459
Propulsion Power	100	UTIL		\$0.60	CARMI		\$591,905
Subtotal						<b>12.3</b>	<b>\$2,445,372</b>
<b>Vehicle Maintenance</b>							
Vehicle Maintenance Manager	200	LABOR	\$88,800	Fixed		1.0	\$88,800
Administrative Assistant	200	LABOR	\$40,000	Fixed		0.5	\$20,000
Clerk	200	LABOR	\$33,000	Fixed		1.0	\$33,000
Vehicle Maint. Supervisor	200	LABOR	\$66,000	0.118	# Technicians	2.0	\$132,000
Rail Vehicle Technician	200	LABOR	\$55,000	0.013	1,000 CARMI	13.0	\$715,000
Rail Vehicle Cleaner	200	LABOR	\$33,000	0.533	PKCAR	8.0	\$264,000
Overtime	200	LABOR		10.0%	Tech/Cleaner wages		\$97,900
Fringe Benefits	200	LABOR		55.6%	Wages & Salaries		\$750,449
Contract Services	200	SERV		\$0.07	CARMI		\$67,300
Materials & Supplies	200	MATL		\$0.86	CARMI		\$849,300
Miscellaneous	200	MISC		\$42.00	Dept. Employee		\$1,071
Subtotal						<b>25.5</b>	<b>\$3,018,820</b>

**Table 6 (cont.)**  
**O&M Model Line Item Detail**  
**(Sample: Metromover System Test Case)**

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b>Facilities Maintenance</b>							
Administrative Assistant	300	LABOR	\$40,000	Fixed		0.5	\$20,000
Chief Supv., Power & Signals	300	LABOR	\$70,000	Fixed		1.0	\$70,000
Chief Supv., Track & Structures	300	LABOR	\$70,000	Fixed		1.0	\$70,000
Traction Power Supervisor	300	LABOR	\$55,000	0.167	# Power Techs	0.0	\$0
Traction Power Technician	300	LABOR	\$42,700	0.473	RTMILE	4.0	\$170,800
Train Control/Signals Supv	300	LABOR	\$55,000	0.154	# TC/Signal Techs	0.0	\$0
Train Control/Signals Tech	300	LABOR	\$42,700	0.513	RTMILE	4.0	\$170,800
Track & Structures Supervisor	300	LABOR	\$55,000	0.154	# T/S Techs	0.0	\$0
Track & Structures Technician	300	LABOR	\$40,000	0.513	RTMILE	4.0	\$160,000
Bldgs & Grounds Supervisor	300	LABOR	\$40,000	0.167	# B&G Svcpersons	3.0	\$120,000
Serviceperson	300	LABOR	\$33,000	0.714	STATION	15.0	\$495,000
Overtime	300	LABOR		10.0%	Tech wages		\$99,660
Fringe Benefits	300	LABOR		55.6%	Wages & Salaries		\$709,279
Materials & Supplies	300	MATL		\$17,000	RTMILE		\$144,500
Contract Services	300	MATL		\$16,000	STATION		\$336,000
Miscellaneous	300	MISC		\$2,400	Dept. Employee		\$78,000
Subtotal						<b>32.5</b>	<b>\$2,644,039</b>

**Table 6 (cont.)**  
**O&M Model Line Item Detail**  
**(Sample: Metromover System Test Case)**

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b>Administration &amp; Support</b>							
General Manager/Supt.	400	LABOR	\$100,000	Fixed		1.0	\$100,000
Accountant	400	LABOR	\$45,000	Fixed		1.0	\$45,000
Safety/Risk Management	400	LABOR	\$40,000	Fixed		1.0	\$40,000
Administrative Assistant	400	LABOR	\$40,000	Fixed		1.0	\$40,000
Reception/Telephone Operator	400	LABOR	\$33,000	Fixed		1.0	\$33,000
Fringe Benefits	300	LABOR		55.6%	Wages & Salaries		\$143,345
Contract Services	400	SERV		\$12,300	PKCAR		\$184,500
Materials & Supplies	400	MATL		\$7,300	PKCAR		\$109,500
Miscellaneous	400	MISC		\$3,000	PKCAR		\$45,000
Casualty & Liability	400	INSUR		\$0.20	CARMI		\$197,302
Casualty & Liability	400	INSUR		\$23,000	RTMILE		\$195,500
Station Utilities	400	UTIL		\$3,000	STATION		\$63,000
Yard/Shop Utilities	400	UTIL		\$50,000	YARD		\$50,000
Subtotal							<b>\$1,246,147</b>
G&A, Overhead Support	400	OTHER		15%	Operating Depts \$		\$1,216,235
Subtotal						<b>5.0</b>	<b>\$2,462,381</b>
<b>TOTAL EMPLOYEES AND COST</b>						<b>75.3</b>	<b>\$10,570,612</b>

- \* Controller assumptions: Control board coverage 365 days per year; for one rail line -- 2 FTEs on first and second shifts, 1 FTE on third shift; productive hours worked per person per year is estimated at 2,080 minus four weeks of vacation, minus 10 holidays and 10 sick days.
- \* It is assumed that some common public transit functions would be performed by managerial and supervisory staff, e.g., Procurement/Contracts, Human Resources, Planning/Scheduling, Marketing/Customer Service.
- \* It is assumed that some functions would be the responsibility of the Airport or Port authorities, e.g., Finance, Audit, Legal.
- \* It is assumed that there would be additional costs for typical support functions such as Procurement/Contracts, Human Resources, Planning and Scheduling, Marketing/Customer Service and Internal Audit. These support costs are simulated by the last line item called "G&A, Overhead Support", calculated as 15% of the combined cost of the three operating "divisions".

## 2.6 Summary of Alternatives

Table 7 displays the set of input statistics used to run the O&M cost model for each study alternative. The inputs were derived from the operating plans described in Section 1.

**Table 7**  
**Input Statistics**

	<b>Concept 1 Airport Only</b>	<b>Concept 2 Airport to Mid Port</b>	<b>Concept 3 Airport to North Port</b>	<b>Concept 4 Airport to Mid Port &amp; North Port</b>
Peak Cars	6	72	64	96
Annual Revenue Car-Miles	239,150	1,630,590	1,599,620	2,428,480
Annual Revenue Car-Hours	45,990	226,700	208,980	320,810
Passenger Stations	4	8	9	11
Directional Route-Miles	1.31	7.04	8.22	10.63
Maintenance Facilities	1	1	1	1

Section 3 presents Modeled Operating and Maintenance (O&M) cost results for each operating plan phasing alternative (described in section 1.4).

### 3.0 Alternative O&M Cost Estimates

#### 3.1 System Phasing O&M cost Estimates

As identified previously, two phasing alternatives have been developed. Alternative A involves the phasing of APM service, starting with Airport only service between Terminal 4 and Terminal 1/ RAC, then service is extended to Mid Port, followed by service being extended to North Port. Phasing Alternative B also begins with Airport only service but phases North Port in prior to Mid Port. The following table summarizes annual O&M cost estimate model results for each of these phasing alternatives. Appendix C contains Line Item Detail's for each operating scenario.

**Table 8**  
**Annual O&M Cost Estimates**  
**By Phasing Alternative**

**Phasing Alternative A**

Cost Centers	Phase 1 Airport Only	Phase 2 Airport to Mid Port	Phase 3 Airport to Mid Port and North Port
Vehicle Operations	\$ 1,344,030	\$ 2,491,604	\$ 3,163,448
Vehicle Maintenance	\$ 738,779	\$ 4,327,582	\$ 6,123,592
Facilities Maintenance	\$ 786,262	\$ 1,770,863	\$2,201,125
Administration & Support	\$ 1,091,710	\$ 3,873,884	\$ 5,091,800
Total Employees	33	76	95
Total Annual O&M Costs	\$ 3,960,781	\$ 12,463,934	\$ 16,579,965

**Phasing Alternative B**

Cost Centers	Phase 1 Airport Only	Phase 2 Airport to North Port	Phase 3 Airport to North Port and Mid Port
Vehicle Operations	\$ 1,344,030	\$ 2,488,302	\$ 3,163,448
Vehicle Maintenance	\$ 738,779	\$ 4,185,787	\$ 6,123,592
Facilities Maintenance	\$ 786,262	\$ 1,799,273	\$2,201,125
Administration & Support	\$ 1,091,710	\$ 3,689,177	\$ 5,091,800
Total Employees	33	74	95
Total Annual O&M Costs	\$ 3,960,781	\$ 12,162,539	\$ 16,579,965

**APPENDIX A**  
**APM Run Time Estimates**

**TABLE 1**  
**On-Airport AMP Only - Run Time Simulation**  
**All Alternatives**

Section/Station/Curve	Maximum Speed (mph)	Distance (feet)	Distance (miles)	Cumulative Distance (miles)	Running Time (min.)	Delay Time (min.)	Dwell Time (min.)	Elapsed Run Time (min.)
Terminal 4				0.00			00:00:00	00:00:00
	10	1350	0.26		00:01:38	00:00:29		
Terminal 3				0.26			00:00:40	00:02:47
	10	650	0.12		00:00:51	00:00:15		
Terminal 2				0.38			00:00:40	00:04:34
	15	1450	0.27		00:01:15	00:00:23		
RAC				0.65			00:01:30	00:07:41
	15	1450	0.27		00:01:15	00:00:23		
Terminal 2				0.93			00:00:40	00:09:59
	10	650	0.12		00:00:51	00:00:15		
Terminal 3				1.05			00:00:40	00:11:45
	10	1350	0.26		00:01:38	00:00:29		
Terminal 4				1.31			00:01:00	00:14:52
		6900					<b>00:05:10</b>	
					Simulated Average Running Speed =			5.27
					Simulated Average Running Speed w/o Dwell =			8.08

Notes:

- (1) Maximum speeds are based on vehicle performance criteria and alignment curve radii.
- (2) Station-to-station distances (measured from center of platform) and curve locations are based on Alignment Drawings (URS).
- (3) Run times are based on vehicle performance characteristics derived from a train simulation for a typical APM.
- (4) Delay times are estimated for each segment based on alignment and maximum speed.

Prepared by Manuel Padron & Associates

**TABLE 2**  
**Airport to Midport AMP Only - Run Time Simulation**  
**All Alternatives**

Section/Station/Curve	Maximum Speed (mph)	Distance (feet)	Distance (miles)	Cumulative Distance (miles)	Running Time (min.)	Delay Time (min.)	Dwell Time (min.)	Elapsed Run Time (min.)
<b>Terminal 4</b>				0.00			00:00:00	00:00:00
	10	1350	0.26		00:01:38	00:00:29		
<b>Terminal 3</b>				0.26			00:00:40	00:02:47
	10	650	0.12		00:00:51	00:00:15		
<b>Terminal 2</b>				0.38			00:00:40	00:04:34
	15	1450	0.27		00:01:15	00:00:23		
<b>RAC</b>				0.65			00:00:40	00:06:51
	25	1800	0.34		00:00:55	00:00:11		
<b>IMC</b>				0.99			00:00:40	00:08:37
	15	1100	0.21		00:00:54	00:00:16		
<b>end of curve</b>				1.20			00:00:00	00:09:47
	25	2500	0.47		00:01:08	00:00:14		
<b>CCPT</b>				1.68			00:00:40	00:11:49
	25	4575	0.87		00:02:10	00:00:26		
<b>WYE</b>				2.54			00:00:00	00:14:25
	15	2000	0.38		00:01:31	00:00:27		
<b>end of curve</b>				2.92			00:00:00	00:16:23
	10	1950	0.37		00:02:16	00:00:41		
<b>Mid Port #1</b>				3.29			00:01:00	00:20:20
	20	2400	0.45		00:01:34	00:00:28		
<b>Mid Port #2</b>				3.75			00:01:30	00:23:52
	20	2400	0.45		00:01:34	00:00:28		
<b>Mid Port #1</b>				4.20			00:01:00	00:26:54
	10	1950	0.37		00:02:16	00:00:41		
<b>start of curve</b>				4.57			00:00:00	00:29:51
	15	2000	0.38		00:01:31	00:00:27		
<b>WYE</b>				4.95			00:00:00	00:31:50
	25	4575	0.87		00:02:03	00:00:25		
<b>CCPT</b>				5.81			00:00:40	00:34:57
	25	2500	0.47		00:01:14	00:00:15		
<b>start of curve</b>				6.29			00:00:00	00:36:26
	15	1100	0.21		00:00:55	00:00:16		
<b>IMC</b>				6.50			00:00:40	00:38:17
	25	1800	0.34		00:00:55	00:00:11		
<b>RAC</b>				6.84			00:00:40	00:40:03
	15	1450	0.27		00:01:15	00:00:23		
<b>Terminal 2</b>				7.11			00:00:40	00:42:21
	10	650	0.12		00:00:51	00:00:15		
<b>Terminal 3</b>				7.23			00:00:40	00:44:07
	10	1350	0.26		00:01:38	00:00:29		
<b>Terminal 4</b>				7.49			00:01:00	00:47:15
		39550					<b>00:11:10</b>	
					Simulated Average Running Speed =			9.51
					Simulated Average Running Speed w/o Dwell =			12.46

Notes:

- (1) Maximum speeds are based on vehicle performance criteria and alignment curve radii.
- (2) Station-to-station distances (measured from center of platform) and curve locations are based on Alignment Drawings (URS)
- (3) Run times are based on vehicle performance characteristics derived from a train simulation for a typical APM.
- (4) Delay times are estimated for each segment based on alignment and maximum speed.

Prepared by Manuel Padron & Associates

**TABLE 3**  
**Airport to Northport AMP Only - Run Time Simulation**  
**All Alternatives**

Section/Station/Curve	Maximum Speed (mph)	Distance (feet)	Distance (miles)	Cumulative Distance (miles)	Running Time (min.)	Delay Time (min.)	Dwell Time (min.)	Elapsed Run Time (min.)
<b>Terminal 4</b>				0.00			00:00:00	00:00:00
	10	1350	0.26		00:01:38	00:00:29		
<b>Terminal 3</b>				0.26			00:00:40	00:02:47
	10	650	0.12		00:00:51	00:00:15		
<b>Terminal 2</b>				0.38			00:00:40	00:04:34
	15	1450	0.27		00:01:15	00:00:23		
<b>RAC</b>				0.65			00:00:40	00:06:51
	25	1800	0.34		00:00:55	00:00:11		
<b>IMC</b>				0.99			00:00:40	00:08:37
	15	1100	0.21		00:00:54	00:00:16		
<b>end of curve</b>				1.20			00:00:00	00:09:47
	25	2500	0.47		00:01:08	00:00:14		
<b>CCPT</b>				1.68			00:00:40	00:11:49
	25	4575	0.87		00:02:10	00:00:26		
<b>WYE</b>				2.54			00:00:00	00:14:25
	20	425	0.08		00:00:14	00:00:04		
<b>start of curve</b>				2.62			00:00:00	00:14:43
	20	2200	0.42		00:01:22	00:00:25		
<b>Terminal 18</b>				3.04			00:00:40	00:17:10
	20	1400	0.27		00:00:53	00:00:16		
<b>end of curve</b>				3.30			00:00:00	00:18:19
	25	2750	0.52		00:01:14	00:00:15		
<b>North Port #1</b>				3.83			00:01:00	00:20:48
	20	1500	0.28		00:01:04	00:00:19		
<b>North Port #2</b>				4.11			00:01:00	00:23:11
	20	1500	0.28		00:01:04	00:00:19		
<b>North Port #1</b>				4.39			00:01:00	00:25:34
	25	2750	0.52		00:01:20	00:00:16		
<b>start of curve</b>				4.91			00:00:00	00:27:10
	20	1400	0.27		00:00:54	00:00:16		
<b>Terminal 18</b>				5.18			00:00:40	00:29:00
	20	2200	0.42		00:01:21	00:00:24		
<b>start of curve</b>				5.60			00:00:00	00:30:45
	20	425	0.08		00:00:14	00:00:04		
<b>WYE</b>				5.68			00:00:00	00:31:04
	25	4575	0.87		00:02:03	00:00:25		
<b>CCPT</b>				6.54			00:00:40	00:34:11
	25	2500	0.47		00:01:14	00:00:15		
<b>start of curve</b>				7.02			00:00:00	00:35:40
	15	1100	0.21		00:00:55	00:00:16		
<b>IMC</b>				7.23			00:00:40	00:37:32
	25	1800	0.34		00:00:55	00:00:11		
<b>RAC</b>				7.57			00:00:40	00:39:18
	15	1450	0.27		00:01:15	00:00:23		
<b>Terminal 2</b>				7.84			00:00:40	00:41:35
	10	650	0.12		00:00:51	00:00:15		
<b>Terminal 3</b>				7.96			00:00:40	00:43:21
	10	1350	0.26		00:01:38	00:00:29		
<b>Terminal 4</b>				8.22			00:01:00	00:46:29
		43400					<b>00:12:00</b>	
					Simulated Average Running Speed =			10.61
					Simulated Average Running Speed w/o Dwell =			14.30

Notes:

- (1) Maximum speeds are based on vehicle performance criteria and alignment curve radii.
- (2) Station-to-station distances (measured from center of platform) and curve locations are based on Alignment Drawings (URS)
- (3) Run times are based on vehicle performance characteristics derived from a train simulation for a typical APM.
- (4) Delay times are estimated for each segment based on alignment and maximum speed.

Prepared by Manuel Padron & Associates

**APPENDIX B**  
**APM Operating Plans**

**Ft. Lauderdale Airport - Port Everglades  
AIRPORT ONLY - APM Operating Plan**

**Table 1**

<b>Operating Patterns:</b>				Dist. miles	Times (minutes)			Headway min.	Vehicles			1-way train trips		Oper. Statistics	
#	From	To	Period		Run	Turn	Cycle		Trains	Consist	Cars	hour	period	Car-Mi.	Car-Hrs.
<b><i>Weekday Operations</i></b>															
1.	Term 4	RAC	Base	0.7	7.4	0.1	15.0	5.0	3	2	6	24	372	484	93
1.	Term 4	RAC	Early/Late	0.7	7.4	0.1	15.0	5.0	3	2	6	24	132	172	33
<i>Totals:</i>									3	total	6				
									20% spares:	2					
									<b>Fleet size =</b>	<b>8</b>		48	504	655	126
<b><i>Saturday Operations</i></b>															
1.	Term 4	RAC	Base	0.7	7.4	0.1	15.0	5.0	3	2	6	24	372	484	93
1.	Term 4	RAC	Early/Late	0.7	7.4	0.1	15.0	5.0	3	2	6	24	132	172	33
<i>Totals:</i>												48	504	655	126
<b><i>Sunday Operations</i></b>															
1.	Term 4	RAC	Base	0.7	7.4	0.1	15.0	5.0	3	2	6	24	372	484	93
1.	Term 4	RAC	Early/Late	0.7	7.4	0.1	15.0	5.0	3	2	6	24	132	172	33
<i>Totals:</i>												48	504	655	126
NOTES:															
											<b>Weekday totals:</b>	504	655	126	
											<b>Saturday totals:</b>	504	655	126	
											<b>Sunday totals:</b>	504	655	126	
											<b>Annual totals:</b>	183,960	239,150	45,990	

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**Ft. Lauderdale Airport - Port Everglades  
AIRPORT TO MIDPORT - APM Operating Plan**

**Table 2**

<b>Operating Patterns:</b>				Dist. miles	Times (minutes)			Headway min.	Vehicles			1-way train trips		Oper. Statistics	
#	From	To	Period		Run	Turn	Cycle		Trains	Consist	Cars	hour	period	Car-Mi.	Car-Hrs.
<b>Weekday Operations</b>															
1.	Term 4	IMC	Base	1.0	8.6	0.4	18.0	2.0	9	3	27	60	930	2,762	418.5
1.	Term 4	IMC	Early/Late	1.0	8.6	1.4	20.0	4.0	5	3	15	30	165	490	82.5
2	IMC	Mid Port #2	Base (Th - Fr)	2.5	14.4	0.6	30.0	5.0	6	2	12	24	120	607	60
2	IMC	Mid Port #2	Early/Late (Th-Fr)	2.5	14.4	0.6	30.0	5.0	6	2	12	24	120	607	60
<i>Totals:</i>									15	total	39				
				<i>M-F</i>								90	1095	3,252	501
				<i>T-F</i>								48	240	1,214	120
<b>Saturday Operations</b>															
1.	Term 4	IMC	Base	1.0	8.6	0.4	18.0	2.0	9	3	27	60	930	2,762	418.5
1.	Term 4	IMC	Early/Late	1.0	8.6	1.4	20.0	4.0	5	3	15	30	165	490	82.5
2	IMC	Mid Port #2	Base	2.5	14.4	0.6	30.0	2.0	15	3	45	60	300	2,277	225
2	IMC	Mid Port #2	Early/Late	2.5	14.4	0.6	30.0	5.0	6	2	12	24	120	607	60
<i>Totals:</i>									24	total	72				
									<i>spares:</i>		6				
									<b>Fleet size =</b>		<b>78</b>	174	1515	6,136	786
<b>Sunday Operations</b>															
1.	Term 4	IMC	Base	1.0	8.6	0.4	18.0	2.0	9	3	27	60	930	2,762	418.5
1.	Term 4	IMC	Early/Late	1.0	8.6	1.4	20.0	4.0	5	3	15	30	165	490	82.5
2	IMC	Mid Port #2	Base	2.5	14.4	0.6	30.0	2.0	15	3	45	60	300	2,277	225
2	IMC	Mid Port #2	Early/Late	2.5	14.4	0.6	30.0	5.0	6	2	12	24	120	607	60
<i>Totals:</i>									24	total	72				
									<i>spares:</i>		6				
									<b>Fleet size =</b>		<b>78</b>	174	1515	6,136	786

NOTES:

<b>Weekday totals:</b>	1,095	3,252	501
<i>M-F Svc.</i>			
<b>Weekday totals:</b>	240	1,214	120
<i>Th-Fr Svc.</i>			
<b>Saturday totals:</b>	1,515	6,136	786
<b>Sunday totals:</b>	1,515	6,136	786
<b>Annual totals:</b>	470,840	1,630,590	226,700

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**Ft. Lauderdale Airport - Port Everglades  
AIRPORT TO NORTH PORT - APM Operating Plan**

**Table 3**

<b>Operating Patterns:</b>				Dist. miles	Times (minutes)			Headway min.	Vehicles			1-way train trips		Oper. Statistics	
#	From	To	Period		Run	Turn	Cycle		Trains	Consist	Cars	hour	period	Car-Mi.	Car-Hrs.
<b><u>Weekday Operations</u></b>															
1.	Term 4	IMC	Base	1.0	8.6	0.4	18.0	3.0	6	4	24	40	620	2,455	372
1.	Term 4	IMC	Early/Late	1.0	8.6	1.4	20.0	5.0	4	4	16	24	132	523	88
2	IMC	North Port #2	Base (Th - Fr)	3.1	14.6	0.4	30.0	5.0	6	2	12	24	120	749	60
2	IMC	North Port #2	Early/Late (Th-Fr)	3.1	14.6	0.4	30.0	5.0	6	2	12	24	120	749	60
<i>Totals:</i>									12	total	36				
				M-F								64	752	2,978	460
				T-F								48	240	1,498	120
<b><u>Saturday Operations</u></b>															
1.	Term 4	IMC	Base	1.0	8.6	0.4	18.0	3.0	6	4	24	40	620	2,455	372
1.	Term 4	IMC	Early/Late	1.0	8.6	1.4	20.0	5.0	4	4	16	24	132	523	88
2	IMC	North Port #2	Base	3.1	14.6	0.4	30.0	3.0	10	4	40	40	200	2,496	200
2	IMC	North Port #2	Early/Late	3.1	14.6	0.4	30.0	5.0	6	2	12	24	120	749	60
<i>Totals:</i>									16	total	64				
										spares:	8				
									<b>Fleet size =</b>	<b>72</b>		128	1072	6,223	720
<b><u>Sunday Operations</u></b>															
1.	Term 4	IMC	Base	1.0	8.6	0.4	18.0	3.0	6	4	24	40	620	2,455	372
1.	Term 4	IMC	Early/Late	1.0	8.6	1.4	20.0	5.0	4	4	16	24	132	523	88
2	IMC	North Port #2	Base	3.1	14.6	0.4	30.0	3.0	10	4	40	40	200	2,496	200
2	IMC	North Port #2	Early/Late	3.1	14.6	0.4	30.0	5.0	6	2	12	24	120	749	60
<i>Totals:</i>									16	total	64				
										spares:	8				
									<b>Fleet size =</b>	<b>72</b>		128	1072	6,223	720
NOTES:															
												Weekday totals:	752	2,978	460
												M-F Svc.			
												Weekday totals:	240	1,498	120
												Th-Fr Svc.			
												Saturday totals:	1,072	6,223	720
												Sunday totals:	1,072	6,223	720
APM OPLAN.xls Manuel Padron & Associates												Annual totals:	334,640	1,599,620	208,980

**Ft. Lauderdale Airport - Port Everglades**  
**AIRPORT TO MID PORT & NORTH PORT - APM Operating Plan**  
**ULTIMATE OPERATING PLAN**

**Table 4**

Operating Patterns:				Dist. miles	Times (minutes)			Headway min.	Vehicles			1-way train trips		Oper. Statistics	
#	From	To	Period		Run	Turn	Cycle		Trains	Consist	Cars	hour	period	Car-Mi.	Tr-Hrs.
<b>Weekday Operations</b>															
1.	Term 4	IMC	Base	1.0	8.6	0.4	18.0	2.0	9	4	36	60	930	3,683	558
1.	Term 4	IMC	Early/Late	1.0	8.6	0.4	18.0	3.0	6	4	24	40	220	871	132
2	IMC	Mid Port #2	Base (Th - Fr)	2.5	14.4	0.6	30.0	5.0	6	2	12	24	120	607	60
2	IMC	Mid Port #2	Early/Late (Th-Fr)	2.5	14.4	0.6	30.0	5.0	6	2	12	24	120	607	60
2	IMC	North Port #2	Base (Th - Fr)	3.1	14.6	0.4	30.0	5.0	6	2	12	24	120	749	60
2	IMC	North Port #2	Early/Late (Th-Fr)	3.1	14.6	0.4	30.0	5.0	6	2	12	24	120	749	60
<i>Totals:</i>									21	total	60				
				M-F								100	1150	4554	690
				T-F								96	480	2,712	240
<b>Saturday Operations</b>															
1.	Term 4	IMC	Base	1.0	8.6	0.4	18.0	2.0	9	4	36	60	930	3,683	558
1.	Term 4	IMC	Early/Late	1.0	8.6	0.4	18.0	3.0	6	4	24	40	220	871	132
2	IMC	Mid Port #2	Base	2.5	14.4	0.6	30.0	3.0	10	4	40	40	200	2,024	200
2	IMC	Mid Port #2	Early/Late	2.5	14.4	0.6	30.0	6.0	5	2	10	20	100	506	50
2	IMC	North Port #2	Base	3.1	14.6	0.4	30.0	6.0	5	4	20	20	100	1,248	100
2	IMC	North Port #2	Early/Late	3.1	14.6	0.4	30.0	6.0	5	2	10	20	100	624	50
<i>Totals:</i>									24	total	96				
									spares: 12						
									Fleet size =		108	200	1650	8,956	1090
<b>Sunday Operations</b>															
1.	Term 4	IMC	Base	1.0	8.6	0.4	18.0	2.0	9	4	36	60	930	3,683	558
1.	Term 4	IMC	Early/Late	1.0	8.6	0.4	18.0	3.0	6	4	24	40	220	871	132
2	IMC	Mid Port #2	Base	2.5	14.4	0.6	30.0	3.0	10	4	40	40	200	2,024	200
2	IMC	Mid Port #2	Early/Late	2.5	14.4	0.6	30.0	6.0	5	2	10	20	100	506	50
2	IMC	North Port #2	Base	3.1	14.6	0.4	30.0	6.0	5	4	20	20	100	1,248	100
2	IMC	North Port #2	Early/Late	3.1	14.6	0.4	30.0	6.0	5	2	10	20	100	624	50
<i>Totals:</i>									24	total	96				
									spares: 12						
									Fleet size =		108	200	1650	8,956	1090

NOTES:

<b>Weekday totals:</b>	1,150	4,554	690
<i>M-F Svc.</i>			
<b>Weekday totals:</b>	480	2,712	240
<i>Th-Fr Svc.</i>			
<b>Saturday totals:</b>	1,650	8,956	1,090
<b>Sunday totals:</b>	1,650	8,956	1,090
<b>Annual totals:</b>	524,670	2,428,480	320,810

APM OPLAN.xls  
 Manuel Padron & Associates

**APPENDIX C**  
**APM Personnel Job Functions**

# Operations Manager

---

Under the general supervision of the General Manager, perform technical and administrative functions required to maintain the day-to-day operation of the people mover system.

## **Functions**

Assist the General Manager in the overall operation of the people mover system. Perform the General Manager's duties in absences and when assigned. Supervise and assist in special projects and studies as assigned by the General Manager.

Coordinate all recommended changes to policy, procedure and operational processes with the General Manager.

Provide day-to-day leadership, supervision and guidance to operations personnel and activities. Responsible for the day-to-day delivery of people mover service.

Guide and assist Maintenance managers, supervisors and technicians to resolve operating or maintenance problems.

Provide technical training (via Trainer) for operations and maintenance activities.

Ensure conformance and strict adherence among employees to all operating, maintenance and safety policies, regulations, work procedures and instructions.

Provide technical and administrative support in conducting statistical analyses and monitoring performance trends.

Source: JTA Skyway (Assistant Manager job posting)

# Control Center Supervisor

---

Under the direction of the Operations Manager, responsible for monitoring and controlling the automated people mover system.

## **Functions**

Coordinate wayside events for the safety of passengers and maintenance employees while monitoring and controlling the people mover system. Perform the duties of a Controller as needed.

Perform administrative support functions in the department. Schedule Controllers' work assignments and tasks. Monitor the daily performance of Controllers through observation and review of logbooks, tapes and printouts. Maintain Control Center documentation. Coordinate external audits, as required (e.g., federal, state).

Assist in the orientation and training of new Controllers. Responsible for developing and implementing procedures. Conduct monthly safety meetings.

Coordinate with Managers to schedule major events such as equipment modifications, retrofits, extra service, etc.

Source: JTA Skyway

## **Trainer**

---

Under the direction of the Operations Manager and in cooperation with the Maintenance divisions, develop and conduct training programs for new and existing Operations and Maintenance staff.

### **Functions**

Confer with managers, supervisors and employees to gain knowledge of work situations requiring training and to better understand changes in policies, procedures, regulations, business initiatives and technologies. Make suggestions on improving work procedures.

Develop teaching outline and determines instructional methods such as individual training, group instruction, lectures, demonstrations, conferences, meetings, and workshops. Selects or develops teaching aids such as training handbooks, demonstration models, multimedia visual aids, computer tutorials, and reference works.

Coordinate training schedule with the hiring and training demands of the people mover system.

Conduct training sessions covering specified areas such as on-the-job training, refresher training, etc. Test trainees to measure progress and to evaluate effectiveness of training. Report on progress of employees under guidance during training periods.

Oversee training consultants used for specific needs, initiatives or programs.

Assist employees with problems concerning how to perform specific tasks related to their duties. Monitor methods used by employees in performance of their duties and make on-the-spot corrections, as necessary.

Maintain trainee personnel records and technical library.

Source: JTA Skyway

# Controller

---

Under the direct supervision of the Control Center Supervisor, perform responsible work in the monitoring and controlling of the automated people mover system.

## Functions

Responsible for coordinating events to ensure the safety of passengers and maintenance employees while monitoring and controlling the people mover system. Assure the safety and security of the system by following approved technical procedures.

Monitor train movement by the ATS system. Monitor patrons in the system by closed circuit television.

Monitor and control the power level by using a computer. Monitor control room displays.

Monitor work performed by maintenance employees on the system.

Monitor alarms and related safety and security systems.

Monitor and respond to emergency telephones and communications systems.

Perform administrative support functions in the department. Function as Lead Controller if so directed by the Control Center Supervisor or Operations Manager.

Assist as requested in the orientation and training of new Controllers, monthly safety meetings, and safety audits.

Source: JTA Skyway, Senior Skyway Central Control Operator

# Vehicle Maintenance Manager

---

Responsible for the administration and supervision of all vehicle maintenance activities including managing, planning, coordinating and scheduling all car maintenance. Responsibilities include specialization in specific maintenance functions (e.g., electrical, structural, mechanical, air-conditioning, machine shop repair work) or may perform various combinations of these duties.

## Functions

Develop, implement, enforce and routinely review Rail Maintenance Safety Rules, Personnel Rules, Rules of Conduct and Standard Maintenance Procedures to ensure that the people mover system is safe, clean and reliable for employees and patrons.

Oversee analysis and troubleshoots of car equipment systems and failures as necessary to identify causes of equipment failures. Oversee the performance of standard test procedures to locate faults or check the proper operation of repaired or new equipment.

Establish and maintain schedules for scheduled and unscheduled repairs. Estimate work volume and person-hour requirements. Maintain time and equipment history records. Establish or adjust work procedures to meet maintenance or repair schedules. Make recommendations to improve equipment performance and efficiency of work force. Interpret maintenance manuals, schematics and job orders to employees.

Provide interface between operations and maintenance. Report equipment defects to Operations Manager and Control Center. Coordinate vehicle movement and placement with the Control Center.

Establish and enforce an effective safety program to protect maintenance employees from the hazards inherent in the performance of their duties.

Work with suppliers of equipment to make recommendations for solving operational problems.

Design and generate necessary reports and computer analyses that identify any unfavorable patterns or trends in the operation and maintenance of the system.

Sources: JTA Skyway and MARTA (Manager of Car Maintenance)

# Clerk

---

Supervised by an Administrative Assistant, a Clerk works according to well-defined procedures and methods. Detailed instructions are received at the beginning of work and on new assignments, but regular routine assignments may be performed more independently.

## Functions

Perform moderately difficult and varied clerical work of a responsible nature such as typing, keypunch, and operating standard office equipment such as calculator and duplicating machine.

Sort and file material alphabetically, numerically, and by other pre-determined categories. Extract material from files upon request.

Make simple posting to various clerical, fiscal and other records and make data available from records according to standard procedures.

Act as receptionist or desk clerk. Answer routine questions regarding non-technical activities. Direct callers to proper places on the basis of their business requests. Assist in the preparation of routine forms and statements.

Open, sort and distribute mail. Operate postage meter. Bag outgoing mail. Handle other postage materials. Keep simple fiscal and clerical records in accordance with procedures.

Perform arithmetic calculations and verify totals.

Receive, unpack, store, issue and deliver supplies, equipment and miscellaneous materials.

Source: San Diego Trolley, job description for Clerk/Typist

# Vehicle Maintenance Supervisor

---

Under the supervision of the Vehicle Maintenance Manager, perform supervisory work overseeing technicians and car cleaners

## Functions

Assist in the monitoring, tracking and recording of scheduled maintenance programs necessary to ensure maximum levels of system availability.

Ensure stalled vehicle calls are promptly responded to following designated procedures. Provide technical support in the resolution of maintenance and system related failures. Assist Technicians in diagnosis and training.

Supervise maintenance employees. Ensure that work orders are generated and properly completed into the computerized maintenance tracking system.

Report equipment defects to the Vehicle Maintenance Manager.

Review work progress. Maintain accurate daily reports.

Perform quality control inspections.

Keep records of spare parts used and ensure minimum stocking levels are maintained. Keep records of warranty work performed.

Ensure that the interiors and exteriors of all rail cars are properly cleaned at all times. Supervise the work of cleaning crews. Ensure that all supplies necessary to clean the rail cars are available for the cleaning crews. Ensure that all identified damage or unusable interior items are properly repaired (e.g., handrails, seats, doors, emergency door releases, interior lighting).

Ensure compliance with equipment and personal safety requirements and procedures.

Sources: JTA Skyway, MARTA

# Rail Vehicle Technician

---

Rail Vehicle Technicians shall be responsible for carrying out directives, maintenance procedures and manufacturers' recommendations in the repair and maintenance of the people mover vehicles and subsystems.

## Functions

Be knowledgeable in and perform inspections, trouble-shooting, repair, adjustments, overhaul, rebuilding, and replacement of assemblies and sub-assemblies from the use of schematics, manuals and drawings.

Be knowledgeable of the proper use of and exhibit the capability for proper use of tools including, but not limited to, oscilloscope, voltmeter, ammeter, ohmmeter, frequency meters, frequency and special generators.

Be able to work in a variety of areas including, but not limited to, electrical, electromechanical, carpentry and sheetmetal. Be knowledgeable of digital and analog control logic, including interfaces between the rail vehicle, communications and signal equipment.

Repair machinery and equipment used in car maintenance.

Document incidents, accidents and warranty records in accordance with department procedures.

Comply with all safety rules and regulations, departmental operating and administrative policies and procedures.

Assist in training new Technicians, as directed.

Keep work areas clean and free of debris at all times.

Source: San Diego Trolley, Electromechanic job description

# **Chief Supervisor, Power & Signals**

---

Direct the activities of Power and Signals personnel to ensure that proper maintenance and repairs are performed in a timely and effective manner.

## **Functions**

Develop programs and schedules to ensure that power and signal safety standards are met and maintained and that work proceeds with minimal delay. Coordinate with Central Control for track allocation.

Develop and implement procedures for the maintenance and repair of substations and propulsion/electrification system as well as procedures for the upkeep and repair of the people mover's signal system.

Enforce Rail Maintenance Safety Rules, Personnel Rules, Rules of Conduct and Standard Maintenance Procedures.

Receive reports of problems. Evaluate repair problems to ensure the proper line of troubleshooting is followed. Prioritize work assignments. Perform as a work crew Supervisor when needed.

Respond to all emergencies, in and out of regular working hours.

Review the daily log of operations to analyze the failures. Discuss problem areas with Supervisors and Technicians. Take corrective actions where necessary.

Work with equipment suppliers to solve operational problems.

Coordinate instruction between Trainer and trainees to ensure that all personnel are properly trained in safe and efficient techniques and procedures.

Evaluate, recommend and coordinate purchases of power and signal capital equipment.

Coordinate activities of special power and signal contractors/engineers. Perform quality control inspections of contracts to ensure that contractors' performance is conforming to specifications.

Provide input to the General Manager regarding staffing, material and equipment requirements, production efficiency and need for improved equipment for long-range planning.

Source: MARTA, job description for Manager of Maintenance of Way and Power

# Traction Power Supervisor

---

Supervised by the Chief Supervisor, Power & Signals, Traction Power Supervisors share responsibility for maintaining the people mover's propulsion power system in a safe and efficient manner.

## Functions

Conduct on-going reviews of existing technical and administrative plans for traction power maintenance activities and implement improvements.

Plan, coordinate, schedule and manage the activities of individuals involved in traction power systems maintenance. Conduct routine quality checks of maintenance work done on facilities and equipment. Evaluate productivity of subordinates and effectiveness of the program.

Participate in the analysis of new equipment and. Responsible for ensuring that all facilities and equipment for which responsible meet the standards of various government regulators and the Airport Authority.

Enforce safety policies for all work areas responsible for and participate in monthly safety meetings.

Respond to emergencies, as needed. Organize personnel and protective equipment at accident sites to power down and power up in accordance with standard procedures and instructions from Central Control. Supervise and direct work crew at such accident to restore operations in the most expeditious manner.

Arrange for the acquisition of necessary supplies, tools and other equipment required for the maintenance of power and signals. Participate in the process of inspection and testing of equipment prior to acceptance and evaluate results.

Keep abreast of current developments in the areas of track and structures maintenance.

# Traction Power Technician

---

Maintain the electrical power systems to a standard required to operate the people mover system in a safe and efficient manner.

## Functions

Be knowledgeable of maintenance of electronic and electrical equipment such as motors, transformers, resistors, capacitors, coils, relays, filters and other related equipment. Properly use a variety of tools, machines and test equipment including, but not limited to volt-ohmmeters, ammeters, frequency meters, frequency counters, oscilloscopes and hand/power tools used in the maintenance of complex electrical/electronic equipment.

Perform electronic and electrical diagnosis by reading and interpreting electronic or electrical schematics.

As directed, perform substation maintenance, inspection, repair and testing. Work individually or in a group.

Daily inspection and maintenance of the electrification system including contact, and associated hardware and software.

Monitor/assist contractors performing special work within the right-of-way.

Complete work assignments in accordance with instructions and established procedures for track maintenance and proper and safe use of track equipment.

Source: MARTA, job description for Journeyman Electronics-Power

# **Train Control/Signals Supervisor**

---

Supervised by the Chief Supervisor, Power & Signals, Supervisors are primarily responsible for overseeing a crew of electronic technicians in the repair and preventive maintenance of train control systems.

## **Functions**

Plan, coordinate, schedule and manage the activities of individuals involved in train control and signals maintenance. Conduct routine quality checks of maintenance work done on facilities and equipment. Evaluate productivity of subordinates and effectiveness of the program.

Participate in the analysis of new equipment and techniques as they may relate to train control, signals and related equipment to ensure efficient and cost effective maintenance. Responsible for ensuring that all facilities and equipment for which responsible meet the standards of various government regulators and the Airport Authority.

Enforce safety policies for all work areas responsible for and participate in monthly safety meetings.

Respond to emergencies, as needed.

Arrange for the acquisition of necessary supplies, tools and other equipment required for the maintenance of track and way. Participate in the process of inspection and testing of equipment prior to acceptance and evaluate results.

Keep abreast of current developments in the areas of track and structures maintenance.

# **Train Control/Signals Technician**

---

Supervised by a Train Control/Signals Supervisor, Technicians are responsible for servicing, repairing and maintaining train control and wayside signals systems to a standard required to operate the transit system in a safe and efficient manner.

## **Functions**

As directed, perform preventive maintenance and repair of the train control and wayside signals system.

Monitor/assist contractors performing special work within the right-of-way.

Complete work assignments in accordance with instructions and established procedures for train control and signals maintenance and proper and safe use of track equipment.

Be knowledgeable of maintenance of electronic and electrical equipment such as motors, transformers, resistors, capacitors, coils, relays, filters and other related equipment.

Properly use a variety of tools, machines and test equipment including, but not limited to, volt meters, ammeters, frequency meters, oscilloscopes and other test equipment required for maintaining complex electronic equipment.

Perform electronic and electrical diagnosis by reading and interpreting electronic schematics and prints.

Source: MARTA, job description for Journeyman-Train Control

# Chief Supervisor, Track & Structures

---

Direct the activities of Track personnel to ensure that proper maintenance and repairs are performed in a timely and effective manner.

## Functions

Develop track maintenance programs and schedules to ensure that track safety standards are met and maintained and that work proceeds with minimal delay. Coordinate with Central Control for track allocation.

Monitor the effectiveness of work crew Supervisors in completing their assignments properly and on time. Assist Supervisors to troubleshoot and problem solve, as necessary. Perform as a work crew Supervisor when needed.

Coordinate instruction between Trainer and trainees to ensure that all personnel are properly trained in safe and efficient techniques and procedures.

Evaluate, recommend and coordinate purchases of track capital equipment.

Coordinate activities of special track contractors (e.g., engineering, rail grinding, rail inspection, track geometry).

Supervise track welding and perform other quality control inspections of new track construction contracts to ensure that contractors' performance is conforming to specifications.

Provide input to the General Manager regarding staffing, material and equipment requirements, production efficiency and need for improved equipment for long-range planning.

Source: MARTA

# Track & Structures Supervisor

---

Supervised by the Chief Supervisor, Track & Structures, Supervisors share responsibility for the maintenance of track and way.

## Functions

Conduct on-going reviews of existing technical and administrative plans for track and way maintenance activities and implement improvements.

Plan, coordinate, schedule and manage the activities of individuals involved in track and way maintenance. Conduct routine quality checks of maintenance work done on facilities and equipment. Evaluate productivity of subordinates and effectiveness of the program.

Participate in the analysis of new equipment and techniques as they may relate to track and way, structures, right-of-way facilities and related equipment to ensure efficient and cost effective maintenance. Responsible for ensuring that all facilities and equipment for which responsible meet the standards of various government regulators and the Airport Authority.

Enforce safety policies for all work areas responsible for and participate in monthly safety meetings.

Respond to emergencies, as needed. Organize equipment and personnel to accident or derailment site for re-railing and/or cleanup. Supervise and direct work crew at such accident to restore operations in the most expeditious manner.

Arrange for the acquisition of necessary supplies, tools and other equipment required for the maintenance of track and way. Participate in the process of inspection and testing of equipment prior to acceptance and evaluate results.

Keep abreast of current developments in the areas of track and structures maintenance.

Source: San Diego Trolley

# Track & Structures Technician

---

Supervised by a Track & Structures Supervisor, Technicians perform preventive maintenance and repair of the track system and associated right-of-way

## Functions

As directed, perform preventive maintenance and repair of the rail track system, including thermic welding, rail grinding, lubricating joints, switches, turnouts, etc.

Monitor/assist contractors performing special work within the right-of-way.

As directed, conduct detailed inspection of rail line to check for defects in track.

Complete work assignments in accordance with instructions and established procedures for track maintenance and proper and safe use of track equipment.

Source: MARTA

# **Building & Grounds Supervisor**

---

Supervised by the General Manager, Building & Grounds Supervisors share responsibility for the maintenance and operation of the maintenance shop, vehicle wash facility, passenger stations, shelters, canopies, signage and other equipment, and parking lots.

## **Functions**

Conduct on-going reviews of existing maintenance programs for facilities and related equipment. Suggest improvements and changes, with justification, to the General Manager. Implement changes as directed by the General Manager.

Plan, coordinate, schedule and manage the activities of Servicepersons involved in facilities maintenance. Conduct routine quality checks of maintenance work done on facilities and equipment. Evaluate productivity of subordinates and effectiveness of the program.

Monitor and coordinate contract maintenance activities relating to elevators/escalators, air-conditioning, fans, pumps, building electrical systems, and facilities cleaning contractors.

Participate in the analysis of new equipment and/or structures to ensure efficient and cost effective maintenance. Responsible for ensuring that all facilities and equipment for which responsible meet the standards of various government regulators and the Airport Authority.

Enforce safety policies for all work areas responsible for and participate in monthly safety meetings.

Respond to emergencies, as needed. Investigate causes of equipment failures and take corrective actions. Investigate accidents in the facilities responsible for to determine cause and suggest improvements, if any.

Arrange for the acquisition of necessary supplies, tools and other equipment required for the maintenance of people mover buildings and grounds.

Provide input to the General Manager regarding staffing, material and equipment requirements, production efficiency and need for improved equipment for long-range planning.

Keep abreast of current developments in the areas of facilities/equipment maintenance.

Source: San Diego Trolley, job description for Supervisor of Facilities and Services

# Serviceperson

---

Servicepersons work under the direction of a Building & Grounds Supervisor. They may be required to work in inclement weather conditions, day or evening hours, through shift rotations, and at various locations.

## Functions

Pick up trash along the rail right-of-way.

Service the rail car washing facility.

Perform routine cleaning of shops, stations, restrooms and offices.

Assist the Building & Grounds Supervisor in the inspection of contracted out services and help document violations of contracts.

Clean light fixtures; replace bulbs as required.

Source: San Diego Trolley and MARTA

# Accountant

---

The Accountant performs a wide variety of tasks related to the maintenance of the people mover's financial record-keeping system.

## Functions

Reconcile various financial reports.

Maintain subsidiary ledgers.

Administer accounts payable and accounts receivable.

Record petty cash expenditures.

Process employee payroll.

Coordinate audit schedules.

Source: San Diego Trolley, job description for Bookkeeper

# **Administrative Assistant**

---

Under the direction of a department Manager or Supervisor, perform responsible staff support work. Specific tasks vary among positions assigned to this classification.

## **Functions**

Word process/type correspondence, memoranda, reports, schedules, statistical data, and other documents from rough drafts, transcribing machines, notes and oral instructions, in rough draft and finished copy.

Audit and proof a variety of statistical reports, records and data specific to the department.

Input various data into the computer using word processing-based software and/or special software applications. Store, access and print information from a personal computer.

Receive, sort, prioritize and route mail, data, messages, reports, correspondence and other documents. Maintain specialized records of the department to which assigned.

Maintain and retrieve from files work orders, schedules, material and documents according to number, name, subject, alphabet or other sorting method. Maintain vertical, index, folder and computerized file records.

Maintain employee time and attendance records; prepare data for payroll department. Maintain confidential department personnel files.

Coordinate staff requests for information and meetings with the Manager/Supervisor and prioritize them for proper time management. Attend department meetings. Take and transcribe meeting minutes.

Answer and screen telephone calls to provide the Manager/Supervisor with sufficient time for priorities. Interview visitors. Provide requested information or refer them to the appropriate person for assistance.

Source: JTA Skyway

**APPENDIX D**  
**APM Detailed O&M Cost Estimates**

**Ft. Lauderdale Airport - Port Everglades People Mover System**

**O&M Cost Model**

**Table 2. Line Item Detail**

**Concept 1**

**Airport Only**

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b>Vehicle Operations</b>							
Operations Manager	100	LABOR	\$88,800	Fixed		1.0	\$88,800
Administrative Assistant	100	LABOR	\$33,000	Fixed		1.0	\$33,000
Control Center Supervisor	100	LABOR	\$63,600	Fixed		1.0	\$63,600
Trainer	100	LABOR	\$60,000	Fixed		1.0	\$60,000
Controller	100	LABOR	\$56,400	Fixed	Sys operating plan*	8.3	\$467,864
Overtime	100	LABOR		5.0%	Controller wages		\$23,393
Fringe Benefits	100	LABOR		55.6%	Wages & Salaries		\$409,287
Contract Security; Post	100	SERV		\$33,000	STATION		\$0
Other Contract Services	100	SERV		\$1.00	CARHR		\$45,990
Materials & Supplies	100	MATL		\$500	Dept. Employee		\$6,148
Miscellaneous	100	MISC		\$200	Dept. Employee		\$2,459
Propulsion Power	100	UTIL		\$0.60	CARMI		\$143,490
Subtotal						<b>12.3</b>	<b>\$1,344,030</b>
<b>Vehicle Maintenance</b>							
Vehicle Maintenance Manager	200	LABOR	\$88,800	Fixed		1.0	\$88,800
Administrative Assistant	200	LABOR	\$33,000	Fixed		0.5	\$16,500
Clerk	200	LABOR	\$33,000	Fixed		1.0	\$33,000
Vehicle Maint. Supervisor	200	LABOR	\$66,000	0.118	# Technicians	0.0	\$0
Rail Vehicle Technician	200	LABOR	\$55,000	0.009	1,000 CARMI	2.0	\$110,000
Rail Vehicle Cleaner	200	LABOR	\$33,000	0.267	PKCAR	2.0	\$66,000
Overtime	200	LABOR		10.0%	Tech/Cleaner wages		\$17,600
Fringe Benefits	200	LABOR		55.6%	Wages & Salaries		\$184,404
Contract Services	200	SERV		\$0.07	CARMI		\$16,315
Materials & Supplies	200	MATL		\$0.86	CARMI		\$205,888
Miscellaneous	200	MISC		\$42.00	Dept. Employee		\$273
Subtotal						<b>6.5</b>	<b>\$738,779</b>

**Ft. Lauderdale Airport - Port Everglades People Mover System**

**O&M Cost Model**

**Table 2. Line Item Detail**

**Concept 1**

**Airport Only**

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b>Facilities Maintenance</b>							
Administrative Assistant	300	LABOR	\$33,000	Fixed		0.5	\$16,500
Chief Supv., Power & Signals	300	LABOR	\$70,000	Fixed		1.0	\$70,000
Chief Supv., Track & Structures	300	LABOR	\$70,000	Fixed		1.0	\$70,000
Traction Power Supervisor	300	LABOR	\$55,000	0.167	# Power Techs	0.0	\$0
Traction Power Technician	300	LABOR	\$42,700	0.473	RTMILE	1.0	\$42,700
Train Control/Signals Supv	300	LABOR	\$55,000	0.154	# TC/Signal Techs	0.0	\$0
Train Control/Signals Tech	300	LABOR	\$42,700	0.513	RTMILE	1.0	\$42,700
Track & Structures Supervisor	300	LABOR	\$55,000	0.154	# T/S Techs	0.0	\$0
Track & Structures Technician	300	LABOR	\$40,000	0.513	RTMILE	1.0	\$40,000
Bldgs & Grounds Supervisor	300	LABOR	\$40,000	0.167	# B&G Svcpersons	1.0	\$40,000
Serviceperson	300	LABOR	\$33,000	0.714	STATION	3.0	\$99,000
Overtime	300	LABOR		10.0%	Tech wages		\$22,440
Fringe Benefits	300	LABOR		55.6%	Wages & Salaries		\$233,852
Materials & Supplies	300	MATL		\$17,000	RTMILE		\$22,270
Contract Services	300	MATL		\$16,000	STATION		\$64,000
Miscellaneous	300	MISC		\$2,400	Dept. Employee		\$22,800
Subtotal						<b>9.5</b>	<b>\$786,262</b>

**Ft. Lauderdale Airport - Port Everglades People Mover System**

**O&M Cost Model**

**Table 2. Line Item Detail**

**Concept 1**

**Airport Only**

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b>Administration &amp; Support</b>							
General Manager/Supt.	400	LABOR	\$100,000	Fixed		1.0	\$100,000
Accountant	400	LABOR	\$45,000	Fixed		1.0	\$45,000
Safety/Risk Management	400	LABOR	\$40,000	Fixed		1.0	\$40,000
Administrative Assistant	400	LABOR	\$33,000	Fixed		1.0	\$33,000
Reception/Telephone Operator	400	LABOR	\$30,000	Fixed		1.0	\$30,000
Fringe Benefits	300	LABOR		55.6%	Wages & Salaries		\$137,789
Contract Services	400	SERV		\$12,300	PKCAR		\$73,800
Materials & Supplies	400	MATL		\$7,300	PKCAR		\$43,800
Miscellaneous	400	MISC		\$3,000	PKCAR		\$18,000
Casualty & Liability	400	INSUR		\$0.20	CARMI		\$47,830
Casualty & Liability	400	INSUR		\$23,000	RTMILE		\$30,130
Station Utilities	400	UTIL		\$3,000	STATION		\$12,000
Yard/Shop Utilities	400	UTIL		\$50,000	YARD		\$50,000
Subtotal							<b>\$661,349</b>
G&A, Overhead Support	400	OTHER		15%	Operating Depts \$		\$430,361
Subtotal						<b>5.0</b>	<b>\$1,091,710</b>
<b>TOTAL EMPLOYEES AND COST</b>						<b>33.3</b>	<b>\$3,960,781</b>

- \* Controller assumptions: Control board coverage 365 days per year; for one rail line -- 2 FTEs on first and second shifts, 1 FTE on third shift; productive hours worked per person per year is estimated at 2,080 minus four weeks of vacation, minus 10 holidays and 10 sick days.
- \* It is assumed that some common public transit functions would be performed by managerial and supervisory staff, e.g., Procurement/Contracts, Human Resources, Planning/Scheduling, Marketing/Customer Service.
- \* It is assumed that some functions would be the responsibility of the Airport or Port authorities, e.g., Finance, Audit, Legal.
- \* It is assumed that there would be additional costs for typical support functions such as Procurement/Contracts, Human Resources, Planning and Scheduling, Marketing/Customer Service and Internal Audit. These support costs are simulated by the last line item called "G&A, Overhead Support", calculated as 15% of the combined cost of the three operating "divisions".

**Ft. Lauderdale Airport - Port Everglades People Mover System**

**O&M Cost Model**

**Table 2. Line Item Detail**

**Concept 2**

**Airport to Mid Port**

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b>Vehicle Operations</b>							
Operations Manager	100	LABOR	\$88,800	Fixed		1.0	\$88,800
Administrative Assistant	100	LABOR	\$33,000	Fixed		1.0	\$33,000
Control Center Supervisor	100	LABOR	\$63,600	Fixed		1.0	\$63,600
Trainer	100	LABOR	\$60,000	Fixed		1.0	\$60,000
Controller	100	LABOR	\$56,400	Fixed	Sys operating plan*	8.3	\$467,864
Overtime	100	LABOR		5.0%	Controller wages		\$23,393
Fringe Benefits	100	LABOR		55.6%	Wages & Salaries		\$409,287
Contract Security; Post	100	SERV		\$33,000	STATION		\$132,000
Other Contract Services	100	SERV		\$1.00	CARHR		\$226,700
Materials & Supplies	100	MATL		\$500	Dept. Employee		\$6,148
Miscellaneous	100	MISC		\$200	Dept. Employee		\$2,459
Propulsion Power	100	UTIL		\$0.60	CARMI		\$978,354
Subtotal						<b>12.3</b>	<b>\$2,491,604</b>
<b>Vehicle Maintenance</b>							
Vehicle Maintenance Manager	200	LABOR	\$88,800	Fixed		1.0	\$88,800
Administrative Assistant	200	LABOR	\$33,000	Fixed		0.5	\$16,500
Clerk	200	LABOR	\$33,000	Fixed		1.0	\$33,000
Vehicle Maint. Supervisor	200	LABOR	\$66,000	0.118	# Technicians	2.0	\$132,000
Rail Vehicle Technician	200	LABOR	\$55,000	0.009	1,000 CARMI	14.0	\$770,000
Rail Vehicle Cleaner	200	LABOR	\$33,000	0.267	PKCAR	19.0	\$627,000
Overtime	200	LABOR		10.0%	Tech/Cleaner wages		\$139,700
Fringe Benefits	200	LABOR		55.6%	Wages & Salaries		\$1,003,969
Contract Services	200	SERV		\$0.07	CARMI		\$111,239
Materials & Supplies	200	MATL		\$0.86	CARMI		\$1,403,799
Miscellaneous	200	MISC		\$42.00	Dept. Employee		\$1,575
Subtotal						<b>37.5</b>	<b>\$4,327,582</b>

**Ft. Lauderdale Airport - Port Everglades People Mover System**

**O&M Cost Model**

**Table 2. Line Item Detail**

**Concept 2**

***Airport to Mid Port***

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b><i>Facilities Maintenance</i></b>							
Administrative Assistant	300	LABOR	\$33,000	Fixed		0.5	\$16,500
Chief Supv., Power & Signals	300	LABOR	\$70,000	Fixed		1.0	\$70,000
Chief Supv., Track & Structure:	300	LABOR	\$70,000	Fixed		1.0	\$70,000
Traction Power Supervisor	300	LABOR	\$55,000	0.167	# Power Techs	0.0	\$0
Traction Power Technician	300	LABOR	\$42,700	0.473	RTMILE	4.0	\$170,800
Train Control/Signals Supv	300	LABOR	\$55,000	0.154	# TC/Signal Techs	0.0	\$0
Train Control/Signals Tech	300	LABOR	\$42,700	0.513	RTMILE	4.0	\$170,800
Track & Structures Supervisor	300	LABOR	\$55,000	0.154	# T/S Techs	0.0	\$0
Track & Structures Technician	300	LABOR	\$40,000	0.513	RTMILE	4.0	\$160,000
Bldgs & Grounds Supervisor	300	LABOR	\$40,000	0.167	# B&G Svcpersons	1.0	\$40,000
Serviceperson	300	LABOR	\$33,000	0.714	STATION	6.0	\$198,000
Overtime	300	LABOR		10.0%	Tech wages		\$69,960
Fringe Benefits	300	LABOR		55.6%	Wages & Salaries		\$497,873
Materials & Supplies	300	MATL		\$17,000	RTMILE		\$127,330
Contract Services	300	MATL		\$16,000	STATION		\$128,000
Miscellaneous	300	MISC		\$2,400	Dept. Employee		\$51,600
Subtotal						<b>21.5</b>	<b>\$1,770,863</b>

**Ft. Lauderdale Airport - Port Everglades People Mover System  
O&M Cost Model**

**Table 2. Line Item Detail**

**Concept 2**

**Airport to Mid Port**

<b>Cost Item</b>	<b>Dept.</b>	<b>Type</b>	<b>Baseline Payroll</b>	<b>Factor</b>	<b>Driver</b>	<b>Head Count</b>	<b>Annual Cost (2002 \$)</b>
<b>Administration &amp; Support</b>							
General Manager/Supt.	400	LABOR	\$100,000	Fixed		1.0	\$100,000
Accountant	400	LABOR	\$45,000	Fixed		1.0	\$45,000
Safety/Risk Management	400	LABOR	\$40,000	Fixed		1.0	\$40,000
Administrative Assistant	400	LABOR	\$33,000	Fixed		1.0	\$33,000
Reception/Telephone Operator	400	LABOR	\$30,000	Fixed		1.0	\$30,000
Fringe Benefits	300	LABOR		55.6%	Wages & Salaries		\$137,789
Contract Services	400	SERV		\$12,300	PKCAR		\$885,600
Materials & Supplies	400	MATL		\$7,300	PKCAR		\$525,600
Miscellaneous	400	MISC		\$3,000	PKCAR		\$216,000
Casualty & Liability	400	INSUR		\$0.20	CARMI		\$326,118
Casualty & Liability	400	INSUR		\$23,000	RTMILE		\$172,270
Station Utilities	400	UTIL		\$3,000	STATION		\$24,000
Yard/Shop Utilities	400	UTIL		\$50,000	YARD		\$50,000
Subtotal							<b>\$2,585,377</b>
G&A, Overhead Support	400	OTHER		15%	Operating Depts \$		\$1,288,507
Subtotal						<b>5.0</b>	<b>\$3,873,884</b>
<b>TOTAL EMPLOYEES AND COST</b>						<b>76.3</b>	<b>\$12,463,934</b>

- \* Controller assumptions: Control board coverage 365 days per year; for one rail line -- 2 FTEs on first and second shifts, 1 FTE on third shift; productive hours worked per person per year is estimated at 2,080 minus four weeks of vacation, minus 10 holidays and 10 sick days.
- \* Rail Vehicle Technician assumptions: .009 Rail Technicians for every 1,000 car miles operated or approximately 111,111 car miles per year per Rail Vehicle Technician, MDTA has equivalent of .026 rail vehicle techs for every car mile (older system and technology)
- \* Rail Vehicle Cleaner assumptions: .267 Rail Vehicle Cleaners per peak vehicle or 4 Rail Vehicle Cleaners per every 15 vehicles (MDTA has equivalent of 8 Rail Vehicle Cleaners per every 15 vehicles (older vehicles, downtown general public system))
- \* It is assumed that some common public transit functions would be performed by managerial and supervisory staff, e.g., Procurement/Contracts, Human Resources, Planning/Scheduling, Marketing/Customer Service.
- \* It is assumed that some functions would be the responsibility of the Airport or Port authorities, e.g., Finance, Audit, Legal.
- \* It is assumed that there would be additional costs for typical support functions such as Procurement/Contracts, Human Resources, Planning and Scheduling, Marketing/Customer Service and Internal Audit. These support costs are simulated by the last line item called "G&A, Overhead Support", calculated as 15% of the combined cost of the three operating "divisions".

**Ft. Lauderdale Airport - Port Everglades People Mover System**

**O&M Cost Model**

**Table 2. Line Item Detail**

**Concept 3**

**Airport to North Port**

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b>Vehicle Operations</b>							
Operations Manager	100	LABOR	\$88,800	Fixed		1.0	\$88,800
Administrative Assistant	100	LABOR	\$33,000	Fixed		1.0	\$33,000
Control Center Supervisor	100	LABOR	\$63,600	Fixed		1.0	\$63,600
Trainer	100	LABOR	\$60,000	Fixed		1.0	\$60,000
Controller	100	LABOR	\$56,400	Fixed	Sys operating plan*	8.3	\$467,864
Overtime	100	LABOR		5.0%	Controller wages		\$23,393
Fringe Benefits	100	LABOR		55.6%	Wages & Salaries		\$409,287
Contract Security; Post	100	SERV		\$33,000	STATION		\$165,000
Other Contract Services	100	SERV		\$1.00	CARHR		\$208,980
Materials & Supplies	100	MATL		\$500	Dept. Employee		\$6,148
Miscellaneous	100	MISC		\$200	Dept. Employee		\$2,459
Propulsion Power	100	UTIL		\$0.60	CARMI		\$959,772
Subtotal						<b>12.3</b>	<b>\$2,488,302</b>
<b>Vehicle Maintenance</b>							
Vehicle Maintenance Manager	200	LABOR	\$88,800	Fixed		1.0	\$88,800
Administrative Assistant	200	LABOR	\$33,000	Fixed		0.5	\$16,500
Clerk	200	LABOR	\$33,000	Fixed		1.0	\$33,000
Vehicle Maint. Supervisor	200	LABOR	\$66,000	0.118	# Technicians	2.0	\$132,000
Rail Vehicle Technician	200	LABOR	\$55,000	0.009	1,000 CARMI	14.0	\$770,000
Rail Vehicle Cleaner	200	LABOR	\$33,000	0.267	PKCAR	17.0	\$561,000
Overtime	200	LABOR		10.0%	Tech/Cleaner wages		\$133,100
Fringe Benefits	200	LABOR		55.6%	Wages & Salaries		\$963,633
Contract Services	200	SERV		\$0.07	CARMI		\$109,127
Materials & Supplies	200	MATL		\$0.86	CARMI		\$1,377,136
Miscellaneous	200	MISC		\$42.00	Dept. Employee		\$1,491
Subtotal						<b>35.5</b>	<b>\$4,185,787</b>

**Ft. Lauderdale Airport - Port Everglades People Mover System**

**O&M Cost Model**

**Table 2. Line Item Detail**

**Concept 3**

***Airport to North Port***

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b><i>Facilities Maintenance</i></b>							
Administrative Assistant	300	LABOR	\$33,000	Fixed		0.5	\$16,500
Chief Supv., Power & Signals	300	LABOR	\$70,000	Fixed		1.0	\$70,000
Chief Supv., Track & Structure:	300	LABOR	\$70,000	Fixed		1.0	\$70,000
Traction Power Supervisor	300	LABOR	\$55,000	0.167	# Power Techs	0.0	\$0
Traction Power Technician	300	LABOR	\$42,700	0.473	RTMILE	4.0	\$170,800
Train Control/Signals Supv	300	LABOR	\$55,000	0.154	# TC/Signal Techs	0.0	\$0
Train Control/Signals Tech	300	LABOR	\$42,700	0.513	RTMILE	4.0	\$170,800
Track & Structures Supervisor	300	LABOR	\$55,000	0.154	# T/S Techs	0.0	\$0
Track & Structures Technician	300	LABOR	\$40,000	0.513	RTMILE	4.0	\$160,000
Bldgs & Grounds Supervisor	300	LABOR	\$40,000	0.167	# B&G Svcpersons	1.0	\$40,000
Serviceperson	300	LABOR	\$33,000	0.714	STATION	6.0	\$198,000
Overtime	300	LABOR		10.0%	Tech wages		\$69,960
Fringe Benefits	300	LABOR		55.6%	Wages & Salaries		\$497,873
Materials & Supplies	300	MATL		\$17,000	RTMILE		\$139,740
Contract Services	300	MATL		\$16,000	STATION		\$144,000
Miscellaneous	300	MISC		\$2,400	Dept. Employee		\$51,600
Subtotal						<b>21.5</b>	<b>\$1,799,273</b>

**Ft. Lauderdale Airport - Port Everglades People Mover System**  
**O&M Cost Model**  
**Table 2. Line Item Detail**  
**Concept 3**  
**Airport to North Port**

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b>Administration &amp; Support</b>							
General Manager/Supt.	400	LABOR	\$100,000	Fixed		1.0	\$100,000
Accountant	400	LABOR	\$45,000	Fixed		1.0	\$45,000
Safety/Risk Management	400	LABOR	\$40,000	Fixed		1.0	\$40,000
Administrative Assistant	400	LABOR	\$33,000	Fixed		1.0	\$33,000
Reception/Telephone Operator	400	LABOR	\$30,000	Fixed		1.0	\$30,000
Fringe Benefits	300	LABOR		55.6%	Wages & Salaries		\$137,789
Contract Services	400	SERV		\$12,300	PKCAR		\$787,200
Materials & Supplies	400	MATL		\$7,300	PKCAR		\$467,200
Miscellaneous	400	MISC		\$3,000	PKCAR		\$192,000
Casualty & Liability	400	INSUR		\$0.20	CARMI		\$319,924
Casualty & Liability	400	INSUR		\$23,000	RTMILE		\$189,060
Station Utilities	400	UTIL		\$3,000	STATION		\$27,000
Yard/Shop Utilities	400	UTIL		\$50,000	YARD		\$50,000
Subtotal							<b>\$2,418,173</b>
G&A, Overhead Support	400	OTHER		15%	Operating Depts \$		\$1,271,004
Subtotal						<b>5.0</b>	<b>\$3,689,177</b>
<b>TOTAL EMPLOYEES AND COST</b>						<b>74.3</b>	<b>\$12,162,539</b>

- \* Controller assumptions: Control board coverage 365 days per year; for one rail line -- 2 FTEs on first and second shifts, 1 FTE on third shift; productive hours worked per person per year is estimated at 2,080 minus four weeks of vacation, minus 10 holidays and 10 sick days.
- \* Rail Vehicle Technician assumptions: .009 Rail Technicians for every 1,000 car miles operated or approximately 111,111 car miles per Rail Vehicle Technician, MDTA has equivalent of .026 rail vehicle techs for every car mile (older system and technology)
- \* Rail Vehicle Cleaner assumptions: .267 Rail Vehicle Cleaners per peak vehicle or 4 Rail Vehicle Cleaners per every 15 vehicles MDTA has equivalent of 8 Rail Vehicle Cleaners per every 15 vehicles (older vehicles, downtown general public system)
- \* It is assumed that some common public transit functions would be performed by managerial and supervisory staff, e.g., Procurement/Contracts, Human Resources, Planning/Scheduling, Marketing/Customer Service.
- \* It is assumed that some functions would be the responsibility of the Airport or Port authorities, e.g., Finance, Audit, Legal.
- \* It is assumed that there would be additional costs for typical support functions such as Procurement/Contracts, Human Resources, Planning and Scheduling, Marketing/Customer Service and Internal Audit. These support costs are simulated by the last line item called "G&A, Overhead Support", calculated as 15% of the combined cost of the three operating "divisions".

**Ft. Lauderdale Airport - Port Everglades People Mover System**

**O&M Cost Model**

**Table 2. Line Item Detail**

**Concept 4**

**Airport to Mid Port & North Port**

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b>Vehicle Operations</b>							
Operations Manager	100	LABOR	\$88,800	Fixed		1.0	\$88,800
Administrative Assistant	100	LABOR	\$33,000	Fixed		1.0	\$33,000
Control Center Supervisor	100	LABOR	\$63,600	Fixed		1.0	\$63,600
Trainer	100	LABOR	\$60,000	Fixed		1.0	\$60,000
Controller	100	LABOR	\$56,400	Fixed	Sys operating plan*	8.3	\$467,864
Overtime	100	LABOR		5.0%	Controller wages		\$23,393
Fringe Benefits	100	LABOR		55.6%	Wages & Salaries		\$409,287
Contract Security; Post	100	SERV		\$33,000	STATION		\$231,000
Other Contract Services	100	SERV		\$1.00	CARHR		\$320,810
Materials & Supplies	100	MATL		\$500	Dept. Employee		\$6,148
Miscellaneous	100	MISC		\$200	Dept. Employee		\$2,459
Propulsion Power	100	UTIL		\$0.60	CARMI		\$1,457,088
Subtotal						<b>12.3</b>	<b>\$3,163,448</b>
<b>Vehicle Maintenance</b>							
Vehicle Maintenance Manager	200	LABOR	\$88,800	Fixed		1.0	\$88,800
Administrative Assistant	200	LABOR	\$33,000	Fixed		0.5	\$16,500
Clerk	200	LABOR	\$33,000	Fixed		1.0	\$33,000
Vehicle Maint. Supervisor	200	LABOR	\$66,000	0.118	# Technicians	2.0	\$132,000
Rail Vehicle Technician	200	LABOR	\$55,000	0.009	1,000 CARMI	21.0	\$1,155,000
Rail Vehicle Cleaner	200	LABOR	\$33,000	0.267	PKCAR	26.0	\$858,000
Overtime	200	LABOR		10.0%	Tech/Cleaner wages		\$201,300
Fringe Benefits	200	LABOR		55.6%	Wages & Salaries		\$1,380,444
Contract Services	200	SERV		\$0.07	CARMI		\$165,672
Materials & Supplies	200	MATL		\$0.86	CARMI		\$2,090,714
Miscellaneous	200	MISC		\$42.00	Dept. Employee		\$2,163
Subtotal						<b>51.5</b>	<b>\$6,123,592</b>

**Ft. Lauderdale Airport - Port Everglades People Mover System**

**O&M Cost Model**

**Table 2. Line Item Detail**

**Concept 4**

***Airport to Mid Port & North Port***

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b><i>Facilities Maintenance</i></b>							
Administrative Assistant	300	LABOR	\$33,000	Fixed		0.5	\$16,500
Chief Supv., Power & Signals	300	LABOR	\$70,000	Fixed		1.0	\$70,000
Chief Supv., Track & Structure:	300	LABOR	\$70,000	Fixed		1.0	\$70,000
Traction Power Supervisor	300	LABOR	\$55,000	0.167	# Power Techs	0.0	\$0
Traction Power Technician	300	LABOR	\$42,700	0.473	RTMILE	5.0	\$213,500
Train Control/Signals Supv	300	LABOR	\$55,000	0.154	# TC/Signal Techs	0.0	\$0
Train Control/Signals Tech	300	LABOR	\$42,700	0.513	RTMILE	5.0	\$213,500
Track & Structures Supervisor	300	LABOR	\$55,000	0.154	# T/S Techs	0.0	\$0
Track & Structures Technician	300	LABOR	\$40,000	0.513	RTMILE	5.0	\$200,000
Bldgs & Grounds Supervisor	300	LABOR	\$40,000	0.167	# B&G Svcpersons	1.0	\$40,000
Serviceperson	300	LABOR	\$33,000	0.714	STATION	8.0	\$264,000
Overtime	300	LABOR		10.0%	Tech wages		\$89,100
Fringe Benefits	300	LABOR		55.6%	Wages & Salaries		\$604,215
Materials & Supplies	300	MATL		\$17,000	RTMILE		\$180,710
Contract Services	300	MATL		\$16,000	STATION		\$176,000
Miscellaneous	300	MISC		\$2,400	Dept. Employee		\$63,600
Subtotal						<b>26.5</b>	<b>\$2,201,125</b>

**Ft. Lauderdale Airport - Port Everglades People Mover System**

**O&M Cost Model**

**Table 2. Line Item Detail**

**Concept 4**

**Airport to Mid Port & North Port**

<i>Cost Item</i>	<i>Dept.</i>	<i>Type</i>	<i>Baseline Payroll</i>	<i>Factor</i>	<i>Driver</i>	<i>Head Count</i>	<i>Annual Cost (2002 \$)</i>
<b>Administration &amp; Support</b>							
General Manager/Supt.	400	LABOR	\$100,000	Fixed		1.0	\$100,000
Accountant	400	LABOR	\$45,000	Fixed		1.0	\$45,000
Safety/Risk Management	400	LABOR	\$40,000	Fixed		1.0	\$40,000
Administrative Assistant	400	LABOR	\$33,000	Fixed		1.0	\$33,000
Reception/Telephone Operator	400	LABOR	\$30,000	Fixed		1.0	\$30,000
Fringe Benefits	300	LABOR		55.6%	Wages & Salaries		\$137,789
Contract Services	400	SERV		\$12,300	PKCAR		\$1,180,800
Materials & Supplies	400	MATL		\$7,300	PKCAR		\$700,800
Miscellaneous	400	MISC		\$3,000	PKCAR		\$288,000
Casualty & Liability	400	INSUR		\$0.20	CARMI		\$485,696
Casualty & Liability	400	INSUR		\$23,000	RTMILE		\$244,490
Station Utilities	400	UTIL		\$3,000	STATION		\$33,000
Yard/Shop Utilities	400	UTIL		\$50,000	YARD		\$50,000
Subtotal							<b>\$3,368,575</b>
G&A, Overhead Support	400	OTHER		15%	Operating Depts \$		\$1,723,225
Subtotal						<b>5.0</b>	<b>\$5,091,800</b>
<b>TOTAL EMPLOYEES AND COST</b>						<b>95.3</b>	<b>\$16,579,965</b>

- \* Controller assumptions: Control board coverage 365 days per year; for one rail line -- 2 FTEs on first and second shifts, 1 FTE on third shift; productive hours worked per person per year is estimated at 2,080 minus four weeks of vacation, minus 10 holidays and 10 sick days.
- \* Rail Vehicle Technician assumptions: .009 Rail Technicians for every 1,000 car miles operated or approximately 111,111 car miles per Rail Vehicle Technician, MDTA has equivalent of .026 rail vehicle techs for every car mile (older system and technology)
- \* Rail Vehicle Cleaner assumptions: .267 Rail Vehicle Cleaners per peak vehicle or 4 Rail Vehicle Cleaners per every 15 vehicles MDTA has equivalent of 8 Rail Vehicle Cleaners per every 15 vehicles (older vehicles, downtown general public system)
- \* It is assumed that some common public transit functions would be performed by managerial and supervisory staff, e.g., Procurement/Contracts, Human Resources, Planning/Scheduling, Marketing/Customer Service.
- \* It is assumed that some functions would be the responsibility of the Airport or Port authorities, e.g., Finance, Audit, Legal.
- \* It is assumed that there would be additional costs for typical support functions such as Procurement/Contracts, Human Resources, Planning and Scheduling, Marketing/Customer Service and Internal Audit. These support costs are simulated by the last line item called "G&A, Overhead Support", calculated as 15% of the combined cost of the three operating "divisions".