

Volume 2

Automated People Mover

Detailed Final Report

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2020 Vision

Fort Lauderdale - Hollywood International Airport

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Appendix D	Operating Plan and Operating Cost Estimate

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1. EXECUTIVE SUMMARY

1.1. INTRODUCTION

On June 5, 2001, the County Commission approved an 18-month work program to be undertaken to give definition to a Vision of the what airport facilities will be needed by the year 2020 in order to meet the growth projections of airline and cruise ship passengers. Fort Lauderdale is one of the nation's fastest growing airports. This, coupled with the growth projections predicted for the cruise ship industry out of both Port Everglades and Miami will place undo constraints on the existing transportation network both within the airport and to and from Port Everglades.

This report presents conceptual alignments that were investigated, a final definition of alignment alternatives to be carried forward into the Project Development and Environmental study phase, the ridership, the operating plan and cost, the capital costs, a discussion on vehicle technologies, Federal Funding opportunities and a discussion on the Environmental process itself.

Integration of the automated people mover (APM) with other planned regional transit corridors at the proposed Intermodal Center is also a key element of the program to address regional solutions to mobility as well as providing a multi-modal transit link to the airport and seaport. The Florida Department of Transportation (FDOT) is currently performing their own alternatives analysis for a premium transit east-west corridor with options for linking to FLL. Light rail transit is one of the alternatives being considered for this corridor. Tri-Rail has also been considering the purchase of the Florida East Coast (FEC) railroad right-of-way for implementation of an additional north-south commuter rail service to better serve the region.

1.2. NEED FOR THE PROJECT

The Fort Lauderdale/Hollywood Airport (FLL) is expanding rapidly as a result of a growing cruise industry, and also because FLL is an alternative point of arrival to Miami International Airport (MIA) for visitors to South Florida. Airport passenger volumes will go from 17 Million per year today to over 32 Million per year by 2020. Port Everglades boasts an existing customer base of 3 million cruise passengers per year. This number is projected to increase to 7 million per year by 2020.

Currently, airport operations allow cruise bus shuttles to pick up their passengers in front of each terminal. Cruise bus shuttles serving the cruise industry create a great deal of congestion due to the large number of passengers (together with their baggage) that arrive and depart in discreet blocks of time. The airport to seaport movement is largely limited to four days of the week, namely Thursday through Sunday. However, this could change to daily service in the future. Baggage loading and unloading causes long dwell times for these busses (or trucks, depending on the operator). This in turn creates congestion and the situation will only worsen over time.

Notwithstanding the cruise ship travel forecast, FLL is in need of a landside transit system to serve the following passenger movements, which will also significantly increase with time:

- For inter-terminal connections
- Between the terminals and public parking in the Palm and Hibiscus garages
- To and from the consolidated rental car garage and the terminals
- To access an Intermodal Center (IMC) providing regional transit connections to potential light rail and/or dedicated bus rapid transit lines, to Tri-rail, and for local bus service routes (also part of the 2020 Vision).
- To a centralized cruise ship passenger processing facility (as part of the Port Everglades master plan). The IMC is being planned to serve this need (vs. a separate facility).
- For airport employees
- For on-site Hotel patrons

Most all of these movements are currently being served by shuttle buses and vans, which contribute to the severe congestion on the upper and lower level roadways.

1.3. THE SOLUTION

As airports have grown, people mover type transit systems have been implemented across the country as the primary means to relieve roadway congestion and increasing capacity associated with the growing demand and *they have proven to be very successful, convenient, and user friendly.*

In order to meet the travel demands, it is necessary that the transit system operate in an exclusive right of way void of any pedestrian or vehicle traffic conflicts. The transit system also needs to provide a high level of service (usually 2 to 5 minute headways between trains) to meet the scheduling needs of the passengers. The chosen technology needs to fit within the existing geometry of the airport roadways and for FLL this will require a train turning radii of approximately 100 feet, at minimum. The systems needs to operate 20 to 24 hours a day, every day of the week, 365 days a year.

The best choice for technology given all of the above is what is known as an automated guideway transit system (AGT) or more commonly known as an automated people mover (APM). They are typically rubber-tired trains; electrically powered; can travel at speeds up to 50 mph; each vehicle (or car) is typically 40 to 50 feet in length; holds approximately 70 to 100 people and can be configured in multiple car consists, usually consisting of 2 to 4 car trains. These systems are electrically powered, fully automated (driverless), monitored from a centralized train control center, have both pre-recorded repetitive public address systems in addition to personal emergency public address capabilities and have a high degree of public safety built into the design. Different manufacturers have created these systems specifically for airport use given the discrete requirements common at most airports nationwide.

1.4. THE PUBLIC PROCESS

A Community and Stakeholder Outreach Plan was produced to facilitate input and open dialogue with the public, citizen groups, business and chamber groups, cruise ship operators, hotel operators, tour and tourism groups, environmental groups, City planners and other government officials. A schedule of meetings and outreach activities was presented in the plan. It also detailed the overall approach of the outreach effort.

Staff has been reaching out to the community by presenting the 2020 Vision concepts to various organizations. The following organizations have been briefed: Dania Beach City Commission and Chamber of Commerce, Airport Terminal Tenants, Cruise/tour operators, the Hollywood Business Council, and a joint meeting of the Audubon Society and Sierra Club including residents of Hollywood and Dania Beach.

Public open houses were held on April 8, 2002 (North Broward County) and April 10, 2002 (South Broward County). These workshops were well attended and staff answered questions, received input and disseminated information.

1.5. THE ALIGNMENT

The proposed APM system alignment will have stations at each of the airport terminals, at the proposed Intermodal Center (IMC), two stations at Mid-Port and two stations at North-Port and a potential station at Terminal 18. The station locations for Port Everglades are consistent with the Port's planned facilities as contained in their 2020 Master Plan. Terminal 18 could serve as an interim transfer terminal for passenger embarking and disembarking at Mid-Port. This depends on the ultimate determination of how the system is phased.

In order to handle such capacity, a grade-separated system is warranted. The APM system will therefore be on an elevated guideway allowing trains to run unimpeded on short headways avoiding interference with automobile and pedestrian traffic. Direct connections from the stations to the existing or planned pedestrian overpasses will allow for convenient access to the terminals at both the airport and the seaport.

1.6. THE RIDERSHIP

The peak capacity of the APM system is projected to be 8,320 passengers per hour (year 2020). It is acknowledge that the system will not have such capacities everyday of the week, but that does not diminish the need. Even so, the yearly capacity of the system will be greater than many regional light rail transit systems in the nation.

For an initial on-airport only system, the peak hour capacity is estimated to be 1051 passengers per hour.

1.7. THE OPERATING PLAN

For the ultimate system (year 2020), 24 4-car trains will operate on 2-minute headways corresponding to a fleet size of 96 vehicles. This will provide a capacity of 8400 passengers per hour (pph). Adding 3 spare train sets produces a total fleet size of 108 vehicles.

For an initial on-airport system only, a fleet size of three 2-car trains for a total of six vehicles is needed. The system would operate on 5-minute headways in both directions providing a good level of service to the passenger. It is prudent to have two more vehicles as spares so that the system can be fully functional should one train set become disabled. It also allows for routine maintenance to occur during normal operating hours.

Staffing and operating cost of the system is summarized as follows:

Cost Centers	Phase 1 On-Airport Only	Total System Airport to Mid Port and North Port
Peak/Fleet Vehicles	6 / 8	96 / 108
Total Employees	33	95
Total Annual O&M Costs (2002 dollars)	\$ 3.37 – \$ 3.96 M	\$ 14.09 - \$ 16.58 M

1.8. THE COST

The estimated cost of the system is summarized as follows (millions of dollars, current year):

Item	On-Airport Only Cost	Total System Cost (including On- Airport portion)
Length	0.8 miles	5.7 miles
Guideway Construction	\$28.0	\$139.5
Stations	\$43.0	\$158.0
Signaling, Electrification, Maintenance Yard and Shop, and permits	\$21.0	\$131.0
Vehicles, testing, training and start up	\$16.0	\$180.5
Design Contingency	\$10.8	\$60.9
Subtotal Construction	\$118.8	\$669.9
Contractor's Design & CM (design-build)	\$13.0	\$73.1
Subtotal Design and Construction	\$131.8	\$743.0
Public Art at Stations	\$0.9	\$3.2
PM/CM, Procurement Documents & Environmental Documentation	\$5.8	\$36.8
Right-of-Way	\$0	\$30.0
Change Order Allowance	\$5.9	\$33.5
Project Reserve	\$5.9	\$33.5
Total Cost	\$150	\$880

1.9. VEHICLE TECHNOLOGY

There are many differing type of transit vehicles in use throughout the world. The differing vehicle type are design to accommodate the various system requirements such as: capacity, speed, vehicle floor plan (seats vs. standees), length of system, physical constraints (i.e. maximum length of platform and curvature), and for whom and what the system is intended to serve (airports, tourism, commuters etc.).

Most suppliers manufacture many different types of vehicles to meet the different needs of owners. The plan is to develop our own unique system requirements, provide this information in the form of procurement documents and the vehicle manufacturers will propose what they believe to be the best-suited vehicle to meet the need.

Leading candidates are automated guideway transit (AGT), which is also known as an automated people mover (APM). However, monorail and magnetic levitation vehicle suppliers may wish to propose their systems to meet our defined needs. It will be important to fully define the system and aesthetic requirements for the system and at the same time not be too restrictive so that good competition occurs.

Additional information on the various types of vehicles and their characteristics is included in the folder at the back of this report.

1.10. THE IMPLEMENTATION

The system will most likely be constructed in phases. An "On-Airport" segment could be built first that would link the terminals and the proposed RAC. Even this limited system would reduce congestion by eliminating the need for the multitude of car rental buses and terminal shuttle buses that traverse the airport roadways and it will integrate the system with the proposed reconstruction of the pedestrian bridges and the RAC itself. As a result, this on-airport system can provide the means to help reduce pedestrian-vehicle conflicts that currently exist on the upper and lower level roadways. All of these improvements will reduce passenger travel times between terminals, free up limited curb space, and reduce vehicular emissions as well.

However, a larger phase 1 system would be more prudent linking the Intermodal Center and Mid-Port directly to the airport in the initial phase. This could then be followed by a subsequent link to North-Port. Available funding will be a significant factor in terms of how and when the system is implemented. An initial system could be in service in 5 years if funding were available.

The system can be implemented in three phases:

Phase One: A 0.8 mile On-Airport system linking all of the terminals and the RAC

Phase Two: Extension to Mid-Port

Phase Three: Extension to North-Port

1.11. FEDERAL FUNDING AND THE ENVIRONMENTAL LEAD AGENCY

It is assumed Federal funding will be sought after and sources of funds may come from multiple agencies within the federal government such as the Federal Aviation Administration (FAA), the Federal Highway Administration (FHWA) and the Federal Transit Agency (FTA). A necessary first step will be to identify which agency would act as the lead agency. No matter who the lead agency is (FHWA, FTA or the County), the project will need to satisfy National Environmental Policy Act (NEPA) requirements through an environmental process. According to the FDOT PD&E Manual, the Federal Highway Administration (FHWA) usually serves as the lead Federal agency for NEPA compliance.

The FDOT PD&E Manual states that other local government or regional transportation authorities can serve in the role of lead State agency, but "FHWA will generally request FDOT to assist these governmental entities by acting as a program administrator for environmental document compliance with NEPA".

It will also be important to reach consensus with agency partners such as Port Everglades, Tri-Rail, MPO, Broward County and FDOT to maximize the opportunities for obtaining federal grants/loans and to speak with one voice.

Because of the tragic events of September 11th, there could also be an opportunity now to showcase 2020 Vision projects such as the APM and the IMC as demonstration projects to enhance security between the airport and the Port. The IMC is also a facility that improves regional mobility, inter-modal connections and provides economic development opportunities for the surrounding communities. If the program could be deemed a "Project of Regional or National Significance", the potential for capturing federal funding may be greatly increased.

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2. INITIAL RESEARCH

The proposed APM system consists of an on-airport segment and off-airport segments. The off-airport system will provide a linkage to the Port Everglades cruise ship terminals and is expected to serve cruise ship passengers, the convention center, and will provide opportunities to connect to other planned rail transit systems in the County, including potential light rail, commuter rail, bus routes and bus shuttles.

Initial research was conducted to develop potential alternative alignments and to ascertain how the system might be configured and how it could be linked to other potential transit modes. Where should the system extend? Should the system also serve downtown Ft. Lauderdale, Dania Beach, and Hollywood? How should the system interface with Tri-Rail? How should local bus routes be integrated?

2.1. STAKEHOLDER MEETINGS

In order to fully understand how the people mover (or fixed guideway system) might be implemented and operated it is vital to understand how the total system might be configured. To accomplish this, the project team investigated known transit improvement projects currently being planned and considered. Since the proposed people mover system has the potential to be integrated with a regional system, the team met with various agencies to coordinate proposed studies and/or projects within Broward County. The following is a list of agencies contacted:

- Port Everglades
- Broward County Metropolitan Planning Organization (MPO)
- Florida Department of Transportation, District Four (FDOT)
- Broward County Transit (BC Transit)
- Tri-County Commuter Rail Authority (Tri-Rail)
- City of Fort Lauderdale
- City of Dania Beach
- City of Hollywood
- South Florida Regional Planning Council

A complete list of stakeholders that the 2020 Vision Team met with and the associated meeting notes was included in our Community and Stakeholder Outreach Plan dated November 1, 2001. Information gathered included a discussion of ongoing projects in the planning stages and project description sheets from some of these projects. These ongoing projects and project description sheets were also included in the Community Outreach Plan.

Observations gleaned from these initial meetings revealed that close coordination between agencies and their respective projects and consultants is needed in order to look at and monitor the overall transit network as a whole. As a result, an East/Central Broward Transit Group was formed by FDOT to better coordinate studies and projects. The 2020 Vision Team was invited to join the group and we embraced the coordinated effort. This fostered good communications and raised awareness on the need to coordinate.

The 2020 Vision team then produced maps displaying some of the critical ongoing planning projects in the region and overlaid them on aerial photographic backgrounds of Broward County. It became quite clear that the people mover system needed to be coordinated with other regional transit solutions.

To supplement the effort, the Team conducted field visits to better understand how the people mover might work with other transit systems. We also investigated how the people mover system can be routed within a public right-of-way and with minimal environmental impacts.

Of particular interest is the proposed light rail or premium transit project that will serve the east-west corridor. The people mover system is also dependent on decisions by Tri-Rail, Port Everglades and the neighboring cities when viewing their Master Plans and Community Development Plans.

2.2. TRANSIT GROUP WORKSHOPS

Mr. Jeff Weidner, Mobility Manager of FDOT's Office of Modal Development, saw the need of transit coordination in the County. He formed the East/Central Broward Transit group and he invited the 2020 project team to attend. The first transit group stakeholders meeting occurred on September 7, 2001. The FDOT District Four office in Ft. Lauderdale was the site for the meeting.

The workshop was very productive, generating many "fact finding" questions from the participants to better understand the goals and objectives of the proposed studies and projects. Issues were also raised to better understand how other transportation modes, such as how bicycle and pedestrian traffic might be accommodated within the various studies and projects. Discussions also focused on the interface between Broward County Transit and community transit shuttle/ beach parking routes and schemes. The participants presented their respective projects.

A follow-up workshop was held on October 19th, 2001. The group gave itself a name, "Moving Broward" and discussed goals and missions. In preparation for this second workshop, the 2020 Vision team prepared aerial photo boards showing interface possibilities between the various projects, namely, potential light rail or bus rapid transit routes, Tri-Rail stations and master plan alternatives, City of Hollywood's Intermodal Center and potential shuttle linkage opportunities, Transit Greenways, Ft. Lauderdale Beach transit shuttle routes along with people mover alignment (APM) options. Combinations of these project alternatives are depicted in Appendix A and are further defined in Section 4.1 of this report.

A third workshop was held on March 1, 2002 wherein the participants gave updates on the status of their projects. Additional projects had been added or referenced to the display boards prepared by the 2020 Vision team including water taxis, the I-95 HOV connection study, a transit oriented development study that the City of Plantation is undertaking and a study underway by the Clean Air Cooperative. Follow-up workshops were held on June 21 and September 20, 2002. A web page for the group has been created and can be found at <http://www.movingbroward.org/>. This web page includes a list of the members and the associated projects and contains a wealth of information regarding ongoing projects and their status. Minutes of the meetings are also contained on the web page.

2.3. DISCUSSION OF AGENCIES AND THEIR REGIONAL TRANSIT PROJECTS

Maps and descriptions of all of the projects discussed below can be found on the movingbroward.org web page. Another great Internet site for all agency links and for links to even more information on their planning projects can be found on <http://www.broward.org>.

2.3.1. *Broward County 2020 Long Range Transportation Plan*

The Broward County Metropolitan Planning Organization (MPO) recently updated the region's Long Range Transportation Plan (LRTP) in December 2001. It is important to note that the people mover project and IMC will ultimately need to be shown on the Long Range Plan as a prerequisite to moving forward with Federal Funding participation.

Included in Broward County MPO's LRTP are high performance transit improvements covering a wide range of corridors. In addition, the Airport and Port's expansion plans have been acknowledge in the goals and objectives section of the plan. Specifically,

“Two transportation related projects have been specified in the objectives: Fort Lauderdale Hollywood International Airport and the Port Everglades expansion projects. Their influence on 2020 transportation facilities planning is not to be ignored, and this planning effort seemed to be an appropriate time to make their inclusion part of the process.”

The MPO adopted two corridors of High Performance Transit (HPT) in their cost feasible plan recommendation: 1) the East-West HPT corridor and 2) portions of the downtown HPT corridor. It will be important to follow the development of these corridors through their planning process so that good intermodal connections occur. The Contacts for this long-range plan are Bruce Wilson, Executive Director for the MPO (954-357-6657 and Ossama Al Aschkar (954-357-6653) of the BC Planning and Environmental Protection department. Kittleson and Associates was the consultant. The long-range plan is available for downloading off the Internet at <http://www.broward.org/tpi03700.htm>

2.3.2. *Port Everglades Master Plan*

In August 2001, TranSystems Corporation published an update to the Port Everglades Master Plan for Broward County. This Master Plan Update includes an assessment of the site and current functionality of the seaport as well as forecasting of future economic growth and how existing facilities will meet or fall short of the future needs. Five-year and 10-year implementation plans were prepared as recommendations to Port Everglades. The Port Everglades Master Plan Update included a people mover system that will serve the Mid-Port and North-Port areas of Port Everglades.

As this Master Plan gets implemented, it too will involve close coordination with the Airport's 2020 Vision planning process to capture the necessary synergy needed between these two economic generators in order to fully meet growth projections so that full economic benefits of both Port's will be realized for the County as a whole. Port Everglades Master Plan can be downloaded from <http://www.broward.org/poi05000.htm>. Contact person for Port Everglades is Chris Novack, Director – Construction Management and Planning (954-523-3404 x3664).

2.3.3. *Florida Department of Transportation*

Two current projects are of significance to the planning effort of the people mover.

2.3.3.1. EAST-WEST HIGH PERFORMANCE TRANSIT CORRIDOR STUDY

FDOT has recently started the Alternatives Analysis process for this corridor as discussed above in section 3.3.1. Contact person for this effort is Scott Seeburger, Special Projects Manager (954-777-4632). Again, coordination of this planning effort with 2020 Vision needs to be done. The consultants for this effort are Carter Burgess.

2.3.3.2. ELLER DRIVE OVERPASS

The project will provide a grade separation of Eller Drive over the existing railroad track near the vicinity of SE 14th Ave. This railroad track will serve the Port's future Southport Intermodal Container Transfer Facility (ICTF). The project will also provide a grade separation at NE 7th Ave. along with reconstruction of the EB ramp onto Eller Drive from the I-595 WB on ramp. Beyond NE 7th Avenue, Eller Drive will remain elevated to clear the ICTF spur track. Once clear of the spur track, Eller Drive will descend to grade at the McIntosh Road intersection. The elevated portion of Eller Drive is expected to maintain a cross section of 4-lanes, two-way through lanes separated by a median or a concrete barrier in the center. 2020 Vision staff met with Port Everglades and it was concluded that the best location for the people mover would be on the north side of Eller Drive where more right-of-way exists. The Port will help coordinate the preservation of right-of-way with the Eller Drive project through their plan review process.

2.3.4. *Tri-Rail Commuter Rail Service*

Tri-Rail operates the regional commuter rail service in South Florida. The Tri-Rail Master Plan update is currently being updated. Tri-Rail is utilizing Parsons Brinckerhoff consultants to help them in this planning effort. In their initial efforts, Tri-rail is looking at the FEC corridor as a potential corridor for introducing new commuter rail service. They have also identified a need for an east-west corridor, similar to FDOT's planning efforts, as a vital corridor to feed passengers to their existing north-south commuter rail line (CSX corridor). Michael Williams, Transportation Planning Manager, is the contact person for Tri-Rail (954-942-7245). Similar coordination with this ongoing effort is likewise necessary.

2.3.5. *Broward County Transit*

Broward County Transit operates the regional bus system and is an integral, if not the backbone for integration of bus system routes and for developing feeder bus lines when considering multi-modal connections for all transit solutions being formulated. Hence, coordination with BC Transit is also important in this regard. Their long-range plans are included in the County's 2020 Long Range Transit Plan referenced in Section 3.3.1.

2.3.6. *South Florida Regional Planning Council*

As their mission states, The South Florida Regional Planning Council (SFRPC) is a dynamic agency whose main objectives are to work with the public and private leadership in the South Florida region to achieve a vision of the future, to identify challenges and

opportunities which are regional in scope, and to create and implement strategies that achieve a desired future. They perform local plan review and assist in the development of regional impact (DRI) reporting process, facilitate dispute resolution, provide information on GIS/Mapping, and general review and assistance with regional visioning/facilitation. They need to be kept informed on project progress. The SFRPC phone number is 954-985-4416.

2.3.7. *Cities and other Agencies*

The <http://www.broward.org/> web site contains links to all of the cities in Broward County and agencies as well. Most all cities have redevelopment plans and community planning processes and need to be kept informed and consulted on project status and development. Any regional transit solution needs to be coordinated through each of the cities planning departments; they are stakeholders in each phase of development. Although all cities in the County have a stake in how well airport and seaport connections and multi-modal connections are carried out, the 2020 Vision Team has been working with Mr. Larry Leeds, Director of Growth Management from the City of Dania Beach, Ms. Lori Mertens, Management/Budget Analyst from the City of Hollywood and Ms. Cecelia Hollar, Construction Services Director from the City of Ft. Lauderdale in particular since they are the adjacent neighbors to the airport.

3. DEFINE CONCEPTUAL DEFINITION OF ALTERNATIVE ALIGNMENTS

3.1. ALIGNMENT AND STATION OPTIONS

Preliminary people mover alignments were initially developed based on a variety of scenarios revolving around options being contemplated in the other regional planning studies. The alternatives were created based on the examination of an entire transit system working as a whole, not just an independent alignment on its own. The following objectives were considered in alignment development:

- ✓ To promote regional connections and provide options in the region for increase mobility, the people mover should be integral with the other transit modes in the region.
- ✓ The Broward County east-west transit corridor being planned by FDOT/Tri-rail is an important system that should be planned to connect to the airport people mover system at either the proposed airport Intermodal Center or at a common station away from the IMC (less ideal).
- ✓ Tri-Rail's proposed north-south commuter rail line (Tri-Rail's Alternative 4, FEC corridor) should also be connected at the Intermodal Center with an airport station stop.
- ✓ If the FEC corridor is not developed into a commuter line, then a connection with a commuter rail station on the existing CSX line needs to be considered, either with a people mover station or with a common station with the east-west transit corridor.

- ✓ It is recognized that the Airport's proposed IMC will also have significant facilities to accommodate cruise ship bus shuttles coming from Miami cruise ship terminals serving passengers flying in and out of FLL.
- ✓ To further provide good public transit distribution to multiple destinations (hotels, beaches, retail and business centers), bus shuttle service should be integrated with the transit system stations in each of the cities and communities being served by either the APM system or the high premium transit systems being planned.

Based on the objectives and the research undertaken, station and alignment options emerged integrating the various transit projects into a cohesive system. The station and alignment options are graphically presented in the Figures in Appendix A and are described as follows:

3.1.1. *On-Airport Segment*

3.1.1.1. STATIONS

There will be stations at Terminal 1 (which will also serve the Consolidated Rental Car facility), Terminal 2, Terminal 3 and at the planned International Terminal 4. The stations will be integrated with the new pedestrian bridges that are currently in the planning stages. This will provide seamless access to the terminals and to the RAC.

Brief consideration was given to providing two stations at Terminal 3. This was determined to be a hindrance on the travel time, too costly for benefit received and would not be physically possible given the geometric requirements of the people mover. In addition, the pedestrian bridge consultants are currently planning on providing a single new pedestrian bridge centrally positioned versus refurbishing the existing two pedestrian bridges.

Consideration was also given to providing another station for Terminal 1 on the west end with access provided via the existing pedestrian bridge (the yellow bridge). This station would also provide access to the Hibiscus garage and provide a high level of service to both the garage and Terminal 1. Final determination of adding this station has not occurred. This should be addressed in the next phase of the project. It is currently not included in the cost estimate. Order of magnitude cost is about \$30 million to add this station and retrofit the pedestrian bridge.

3.1.1.2. ALIGNMENTS

Alternatives that were looked at in the conceptual planning for the on-airport segment included four basic horizontal locations:

1. In front of the terminal buildings
2. Between the roadways and the garages (see Figure 1 in Appendix A)
3. Between the roadways and the garages for Terminals 1, 2 and 3 and in front of the new International Terminal.
4. Between the roadway and garages for Terminals 1, 2 and 3 and directly into Terminal 4. (See Figures 2 and 3 in Appendix A)

Per a field site investigation, placing the guideway in front of each of the Terminal Buildings was not considered feasible due to the congested space, the impact it would have on airport operations during construction, and in consideration of the other planned facilities in the terminal curb areas (new canopies and new pedestrian bridge landings).

We then looked at positioning the guideway between the roadways and the garages throughout the terminal loop area (see Figure 1). The stations would be integrated with new pedestrian bridges being planned and the corresponding vertical circulation on the garage side. This alignment was also coordinated with the designs of the RAC facility. This solution provides good facility integration, direct connections, and minimizes construction impacts. More detailed conceptual plans were developed and iterative coordination occurred during the study period optimizing interfaces as parallel designs and facility planning occurred.

We also investigated placing the guideway in front of (along the curb line) of the new International Terminal Building since this will be a new facility and maybe, with proper planning, a direct terminal connection could be achieved. However, the physical space of the columns and massiveness of the structure together with the complexity of integration was considered too overwhelming for this to be carried forward. Siting of the maintenance facility was also problematic.

We then looked at having the people mover entering the middle of Terminal 4 to achieve a direct terminal connection. The terminal 4 structure would be notched to provide for the people mover and this offered architectural advantages in terms of ceiling heights and natural lighting in the adjacent ticketing and concourse areas. This is presented in Figure 2 and is the recommended alignment configuration yielding a high level of service. A cross section of this is depicted in Figure 3.

We also considered three basic alignment configurations:

1. Center/Spine Alignment
2. A closed loop
3. A pinched loop

A center/spine alignment was discarded early on because of the complexity of construction, the impact to garage operations, the fact that the top floor of each of the garages are at different heights and because of fire/life safety concerns. The potential of adding additional floors on top of the consolidated rental car facility plus the relocation of the Hotel off of the RAC to just east of the RAC further complicated this option. This option was also less desirable from a customer service point of view and there were problems with positioning an interim maintenance base within airport property boundaries.

The closed loop option was also investigated (see Figure 4 in Appendix A) keeping the guideway entirely between the roadways and the garage (the only real feasible horizontal location for this operating option).

A basic premise for discounting the closed loop alignment is that it really does not offer any increased level of service to the customer. If trains coming from Port Everglades, for example, occur at 2-minute headways, then service in one-direction within the on-airport

system will be every 4 minutes if every other train goes in each direction. Hence, someone boarding the system at Terminal 4 will, on average, have to wait one headway (2 minutes) to go in either direction (either towards the RAC/IMC or towards Terminals 2 and 3). This means the average wait would be 2 minutes assuming the average customer arrives mid-way between trains.

In a pinched-loop alignment the headway in the terminal area will be the same as the headway of the train coming from the Port since each train traverses the same alignment. Hence, the average wait for a customer will be $\frac{1}{2}$ the headway, or one minute in the example above.

The added guideway length of going from Terminal 4 to 3 to 2 to 1 versus going directly from Terminal 4 to Terminal 1 is about 900 feet. At 10 feet per second travel time, this only equates to 90 seconds plus the added station dwells. Considering many International Terminal arrivals and departures will be traveling to and from Terminal 2 and 3, then the pinched-loop provides a greater level of service for those customers over the closed loop.

Hence, the added cost and complexity of a closed loop system is not considered cost beneficial compared to the pinched-loop. Summarizing all of the factors discounting the closed loop system includes:

- No significant travel-time savings when considering passenger movements in both directions to or from Terminal 4.
- There is not a viable site for an interim maintenance facility with the Hotel placed on the east end of the RAC (the Hotel was relocated off of the RAC in March 2001, nine months into the 2020 Vision Program).
- A very complex structural system would be required for the guideway portion between the Hibiscus and Palm Garages.
- Difficult span lengths and constraints that would be placed on the RAC roadways in the northwest corner of the RAC.
- Would require continual use of two extra turnouts and a complex crossover at the point of convergence. This also would be a source of additional delay if operating schedules were interrupted for any reason.
- Added cost of 1150 feet of guideway plus 4 extra turnouts and a crossover is about \$35 M or 25% of the initial on-airport system cost.

Given all of the above, the pinched loop alignment shown in Figure 2 is the preferred solution.

3.1.2. Off-Airport Segment

3.1.2.1. STATIONS

Per the Port Everglades' Master Plan, there are two stations proposed to serve Mid-Port. The first station will serve Terminals 26 (existing) and Terminal 29 (new). The second (end of the line) Mid-Port station will serve Terminals 21 to 25. There are also two stations that will serve North-Port. North-Port Station #1 will serve a new bi-level pier at Terminal 17 together with existing institutional/office/administration facilities in the station vicinity. North-Port Station #2 will stop at the North-Port Cruise facilities where berthing for two more cruise ships will be accommodated for. This station will also serve the Convention Center.

In conjunction with the introduction of the people mover, the Port will be undertaking a major reconstruction (relocation and expansion) of all Port terminal facilities per their own 2020 Master Plan.

3.1.2.2. ALIGNMENTS

3.1.2.2.1. Alternative A1

A new APM alignment (see Figure 5 in Appendix A) was developed by the 2020 Vision Team (as opposed to previous alignments shown in the Port Everglades' Master Plan document or in the Mega Transport Zone Project report). Upon exiting the IMC, the alignment essentially follows public roads via NE 7th Ave, then east on Eller Drive, then going north along SE 14th Ave. to get to North-Port. For Mid-Port, it continues east on Eller Drive and then turns south along SE 18th Ave. then turns east over the waterway (adjacent to a proposed new roadway bridge per Port Everglades' Master Plan) to get to Mid-Port. *The people mover alignment is consistent with the new roadway system and ancillary facilities per the Port Everglades Master Plan.*

In looking how the people mover might integrate with other regional transit systems, the 2020 Vision team combined differing people mover alignments with differing options being considered for the other regional premium transit systems currently being planned.

As such, Alternative A1 assumes an East-West Light Rail system per Tri-Rail's Alternative 5 Master Plan with extension options to the south serving Cities of Dania Beach and Hollywood. Commuter rail service in the FEC corridor would further enhance this cohesive system. However, if the FEC corridor does not become a commuter rail corridor then the existing Tri-Rail service could connect to the east-west system via the existing Tri-Rail station stop at Broward Blvd and I-95.

3.1.2.2.2. Alternative A2

This alignment is the same as Alternative A1 with a slightly modified people mover alignment on Port property (see Figure 6 in Appendix A). Instead of heading north on SE 14th to get to North-Port, the alignment continues on Eller Drive and turns onto Eisenhower Blvd. This alternative adds a station at the existing cruise ship Terminal 18 (this station is not shown on the Port's Master Plan). This alternative also moves the first people mover station entering North-Port over to Eisenhower Blvd making a better connection to the proposed southern terminal at North-Port. *However, it is not consistent with the Port's*

Master Plan in that it assumes Eisenhower Blvd would not get realigned. It assumes Eisenhower Blvd. would remain as currently configured.

This alternative was jointly developed and coordinated between the 2020 Vision team and with Port Everglades' Director of Construction Management and Planning, Mr. Chris Novack. Alternative A2 also allows for better phasing of the people mover implementation. If the people mover extension to North-Port occurs first, then the new station at Terminal 18 would serve as a transfer point for a bus shuttle to get passengers over to the existing Mid-Port terminals (until the people mover gets built to Mid-Port). Alternative A1 does not offer this feature. This would avoid a "throw away" station should this interim transfer feature be added to Alternative A1 for providing service during the staging of construction.

This alternative would also be more aesthetically pleasing to users of the system going along the waterfront instead of along the refinery tanks.

For this alternative, the connections to other regional systems were assumed to be the same as for Alternative A1.

3.1.2.2.3. Alternative A3

Same as Alternative A1 but the alignment to North-Port goes up an existing railroad corridor that is owned by Port Everglades (see Figure 7 in Appendix A). Some railroad relocation would be required and there would be additional clearance requirements for this alignment if all columns were to remain in the Port owned right of way.

Other safety considerations would come into play with this alternative when considering freight train derailments and liability. Operating agreements would need to be worked out with the railroad even though Port Everglades owns the land.

3.1.2.2.4. Alternative B1

Assumes People Mover Alignment per Port Everglades Master Plan. This alignment traverses through wetlands and Mangrove areas (see Figure 8).

Assumes Light Rail along FDOT's I-595 Corridor with no direct Link to the airport (serving downtown Ft. Lauderdale only). FDOT's initial planning for premium transit in the I-595 corridor showed a light rail leg going south along I-95 with a terminal station at Tri-Rail's Griffin Road station (the "Airport Station"). Passengers would have to use a shuttle bus to then get to the airport.

Extending the people mover to Griffin Road is not practical because of the vertical geometry. With the people mover some 60 feet above grade, it would not be practical to descend down to grade to pass under the potential south runway extension to get south of the airport. It is also predicted that potential ridership to the south would not justify a grade-separated system. A better solution would be to continue extending the light rail line from Griffin Road to the IMC at grade level. This option was considered in Alternative B3. Hence, for the sake of this option, a bus shuttle connection from Griffin Road Station to the airport would provide the transit connection.

Connection with the Tri-Rail CSX corridor would also occur at Griffin road unless of course Tri-Rail implemented service in FEC Corridor, which would hopefully then have a direct connection at the Intermodal Center (IMC). Without Tri-Rail service in the FEC corridor, the southern cities would not get served under this alternative.

3.1.2.2.5. Alternative B2

Same people mover alignment as Alternative B1 (see Figure 9). This too assumes Light Rail along FDOT's I-595 corridor but under this alternative, the airport is directly served with a light rail leg going south to the IMC branching off of the downtown Fort Lauderdale leg. A further extension of the light rail to the south would also provide service to Dania Beach and Hollywood.

Tri-Rail would connect to the light rail system at Broward Blvd. and/or bus shuttle service from Griffin Road would be provided.

3.1.2.2.6. Alternative B3

This option depicts the east-west corridor system utilizing the I-595 corridor, turning south along I-95 to the Tri-Rail airport station at Griffin Road, heading east on Griffin Road to a wye-junction with tracks extending north and south to the downtowns of Ft. Lauderdale, Dania Beach and Hollywood (see Figure 10). Assumes the new people mover alignment developed by 2020 Vision Team. Assumes no Tri-Rail service in the FEC corridor. This east-west corridor alignment will be costly and, because of its circuitous routing and ridership would be compromised due to long travel times.

3.2. INITIAL FINDINGS

Initial findings regarding the alternatives presented and the regional transit system network include the following:

- The design maximum capacity of the Airport to Seaport fixed guideway system is 8,400 passengers per hour in the peak hour and 25,000 to 30,000 passengers per day. Most people mover systems have vehicles that are 40 to 50 feet in length and carry 70 to 100 passengers per vehicle. With physical constraints in the airport terminal core area in regards to station lengths and curvature, a four-car train system seems to be best suited for the capacities envisioned. With 280 passengers per train and two-minute headways during the peak hour, a peak capacity of 8,400 passengers per hour would be realized.
- In order to handle such capacity, a grade-separated system is warranted. It is acknowledge that the system will not have such capacities everyday of the week, but that does not diminish the need. . Even so, the yearly capacity of the system will be greater than many regional light rail transit systems in the nation.
- The east-west premium transit corridor, which FDOT and Tri-Rail are pursuing, will most likely have capacities far less that the airport-seaport connector. Order of Magnitude figures on this will probably fall in the 20,000 to 25,000 passengers per day and 2,000 to 3,000 passengers per hour in the peak. This opinion is based on

- the size of the region served and the population density when considering similar applications elsewhere in the country. The length of this system may be 15 to 20 miles.
- To be cost-effective on a per rider basis, the east-west corridor should be less in unit cost than the people mover. This suggests that for the east-west corridor, an at-grade system with the goal of minimizing right-of-way costs will most likely be the result of that study (which is just getting underway). Light rail transit (LRT) or bus rapid transit (BRT) lends itself to this type of need.
 - It would be very desirable to have the east-west corridor project connect with the airport people mover system to have seamless public transit service to the airport. The best location for this is at the planned Intermodal Center at the airport.
 - Should Tri-Rail implement alternative 4, bringing commuter rail service to the FEC corridor per their Master Plan, then Tri-Rail should connect to the people mover system at the Intermodal Center.
 - Should Tri-Rail not implement commuter rail service in the FEC corridor, then Tri-Rail should connect to the east-west corridor system at Broward Blvd. (assuming the east-west system will have a station stop at Broward Blvd and I-95).
 - It will not be economically prudent to extend the people mover out to the existing Tri-Rail CSX corridor since ridership would not justify the expense. If Tri-Rail connects to the east-west premium transit system then this would provide the transit link from Tri-Rail to the airport (assuming the east-west system comes to the airport. This would entail two transfers for Tri-Rail passengers. Although not ideal, this makes the most sense from an economic vs. projected ridership viewpoint (will most likely be less than 1,000 riders per day). An alternative to the two-transfer consideration is to have timed-transfer bus shuttle service to and from Tri-Rail to the airport at the existing Tri-Rail airport station.
 - The cities of Dania Beach and Hollywood should be considered in the transit planning effort. The growth of the airport and seaport will spark economic development in all neighboring cities and good transit service will be vital to keep up with the pace of growth and will promote tourism. Again, the best-suited means of accomplishing this would be to integrate the southern cities with the east-west corridor project. An at-grade system would balance cost with potential ridership.
 - All of the above support the intermodal center concept at the airport. The intermodal center should also have a bus transfer station connecting local and express bus service to the people mover system, distributing passengers directly to the airport terminals.
 - With a light rail or BRT east-west corridor project serving the airport from I-595 or from downtown Ft. Lauderdale, a natural extension to Dania Beach and Hollywood exists either along US1 or FEC corridor/Dixie highway should be preserved.

- A people mover connection to the convention center provides a great opportunity to integrate a beach shuttle system from the convention center along the Fort Lauderdale beaches.
- With a light rail extension to Dania Beach, an east-west bus shuttle system could be employed in a similar fashion linking downtown with the beaches and other destination points.
- Likewise with the City of Hollywood. The City is planning an intermodal center near Tri-Rail at Hollywood Blvd and an east-west bus system could serve this intermodal center and provide a link to the light rail system and proceed to the beaches and to the new Diplomat Hotel.
- The people mover project can be implemented in phases with the on-airport construction serving as the initial system and expansion to the Port later. Opening a total system would be ideal.
- Public-private partnership should be pursued for transit-oriented development.

4. DEVELOP A COMMUNITY AND STAKEHOLDER OUTREACH PLAN

A community and stakeholder outreach plan was prepared in October 2001 and published and distributed on November 1, 2001. The goals and objectives of the plan was to create a public involvement process that focuses on building business, community and political support that allows BCAD to design and build a world-class gateway as Broward County evolves as an international destination consistent with the economic growth that is projected. Five Main outreach groups were identified:

- County Commission
- General Public and Community Groups
- Transit/Government Agencies (FDOT, Tri-Rail, BC Transit, MPO, Regional Planning Council, RTO, Port Everglades, City Planning Departments)
- City Councils and Other Electeds
- Focus Groups and Business Community (airlines, cruise operators, hotel operators, tour operators and tourism groups, chamber and business groups, environmental groups).

These groups were kept abreast of the 2020 Vision program through meetings, through quarterly update progress mailings and through one on one conversations. In addition, public open houses were held and presentations were made describing the basis of the program and the current status of the project definition. The open houses had tables and easels around the room displaying the various components of the program (i.e. Intermodal center, people mover, hotel/retail complex, exit roadways and the International Terminal 4 concepts) where specific information on each was available. This in turn facilitated communications. Fact sheets were prepared describing potential questions and corresponding answers. Participants were encouraged to log their comments.

In addition to general meetings that were held with coordinating agencies involved in the 2020 Vision implementation planning process, the following organizations were briefed on the proposed future development:

1. Dania Beach City Commission on November 27, 2001 - The Commission was generally in favor of an Intermodal Center (IMC) that brings all modes of transit together; however, they are not in favor of any hotel/retail/commercial development because they view it as direct competition with their existing hotels and retail centers.
2. Airport terminal tenants on December 12, 2001 - This group responded positively to the presentation and most specifically to elements that reduce terminal roadway congestion, such as the on - airport portion of the APM.
3. Cruise/bus/tour operators on December 12, 2001 - This was the annual meeting the airport conducts in preparation for cruise season. This group responded extremely well to the Airport/Seaport connection via a people mover system. They were very receptive to ideas about consolidating the security/baggage process.
4. Dania Beach Chamber of Commerce on December 13, 2001 - This presentation included discussion of the airport's growth over the last twenty years, current construction, and the elements of the 2020 Vision program. There were only a few minutes for questions, and they were from homeowners that were opposed to the runway extension.
5. Hollywood Business Council on January 24, 2002 - The consensus of this group was that although progress and change cannot be slowed down, Hollywood needs to be included, such as providing transit to the south. They recognize that most large airports do have hotels. And they agreed they would not insert themselves in homeowner issues because they represent the business community.
6. Audubon/Sierra on January 24, 2002 - This presentation was a combination of the runway extension and 2020 Vision. As expected, it was widely attended by homeowners (predominantly Dania Beach and Hollywood) who are opposed to the south runway, as well as any airport development that will (in their opinion) take revenue away from their communities.
7. Broward County Board of County Commissioners – On March 12, 2002, an update to the 2020 Vision was presented to the Board. It included a 3D animated video of a cruise passenger leaving Port Everglades on an automated people mover, and arriving at the Airport's proposed Intermodal Center. At that meeting, the Board approved advertising three Requests for Letters of Interest (RLI) for Terminal 4 redesign including a Design Manual, Exit Roadways Design/Build Criteria, and Landscape Master Planning.
8. Sun Sentinel and Miami Herald editorial boards – Three presentations were made to these newspaper boards: two to the Sun Sentinel and one to the Miami Herald. These presentations were conducted to provide the news media with factual information on the projects and answer questions raised by the public.

9. Broward Alliance International Marketing Committee – A presentation to this committee (within the Broward Alliance organization), was made on March 12, 2002. They are in favor of the proposed development and would like to be kept up to date on project developments.
10. Fort Lauderdale Economic Advisory Board – This City of Fort Lauderdale Advisory Board was also in favor of the proposed development and very supportive of the concepts with respect to economic growth in the community.
11. Community Workshops – Two open houses were held; one on Monday, April 8th at the BCC North Library and one on Wednesday, April 10th at the BCC South Library. Mostly consultants who were interested in the various projects attended the workshops. Very few residents attended the open houses, despite advertisements in the newspapers and flyers sent via U.S. mail and e – mail.
12. Deerfield Beach Rotary – At the invitation of the City Manager of Deerfield Beach, the 2020 Vision presentation was conducted on April 16, 2002. The group was very receptive and commented FLL remains the most user – friendly airport in the region.
13. Congressional Delegation – The County Administrator, Airport Director and Seaport Director presented the combined Airport/Seaport Connection – 2020 Visions to the Broward County Congressional Delegation in Washington, D.C., to inform the delegation on the regional transportation issues in south Florida.

The Board of County Commissioners requested that an Airport Task Force be created to give the public and elected officials new opportunities to review and to provide input on the proposed South Runway Expansion Project and on the 2020 Vision projects. The task force held meetings on March 20th, April 10th, May 24th, and June 19th, 2002.

To date, the Task Force has focused primarily on reviewing and requesting information on the South Runway Extension Project. The task force suggested that the Commission move forward with the RLIs for the next PD&E phase, however, the Task Force reserved the right to comment on this project at a later date.

5. DEFINE FINAL DEFINITION OF ALTERNATIVE ALIGNMENTS

Based on the initial findings of the broad set of alternatives, a consolidated range of alternatives emerged for both the on-airport and off-airport alignments that should be taken forward into the Planning, Development and Environmental (PD&E) phase. This final definition of alternatives is presented in Figure 11 of Appendix A. Plan and profile drawings, composite utility drawings and station drawings of the final set of alternatives are presented in Appendix B.

5.1. ON-AIRPORT SEGMENT

Along Terminals 1, 2 and 3 the APM will occupy space between the airport roadways and the garages (See drawings C-1 to C-9). At Terminal 4, two alternatives should be carried forward. One alignment continues with columns located between the roadways and garages with a station adjacent to the Hibiscus garage and positioned to interface directly with a new pedestrian bridge planned for the new International Terminal.

Another alignment takes the APM across the roadways and then down the middle of the planned Terminal 4 complex (See drawings C-10 to C-13). This would be a preferred alignment from a level of service point of view and would allow direct access into Terminal 4. This construction can be phased with the Terminal construction. However, should the Terminal not proceed forward or should the APM precede the Terminal by many years, then many additional facilities would have to be constructed to make the station at Terminal 4 work. This may make the alignment along the garages more preferable. This will be monitored as the program goes forward.

The on-airport portion of the APM needs to interface with other on-going airport projects currently in design and construction. Coordination has been on-going with these other projects and the 2020 Vision team has preserved an APM corridor through the airport proper consistent with our planning efforts.

To study the structural interface that needs to occur with the other projects, we engaged the services of RCT Engineering to analyze this interface based on preliminary column locations provided by the RAC team. RCT Engineering also recommended column locations for the rest of the on-airport alignment along Terminal 2 and 3 so that interfacing with the pedestrian bridges could advance. They weighed the potential cost of the foundations, columns and beams to support the APM structure against the cost of relocating utilities. They also addressed constructability as well. In addition, there are not many options for placement of columns due to the multitude of roadways, structures and planned facilities. Appendix C presents their report on this.

5.1.1. Consolidated Rental Car Facility (RAC) Coordination

In November 2001, the Commission approved contracts to complete the design and the construction for a multi-level rental car facility (RAC) to be built on airport property.

The 2020 Vision team has been coordinating the design interface of the future APM station with the RAC. An APM station platform would be located above the new pedestrian bridge level, which connects to Terminal 1 and the RAC. The primary goal of the coordination was to reach consensus on column locations, vertical connection configurations, and connections to the pedestrian bridge so that construction of an elevated guideway structure and APM station platform can be accommodated in the future, while minimizing future construction disruptions and minimizing initial sunk costs.

Drawings A-100 through A-103 show conceptual plan views of the RAC interfacing with the people mover for each of the levels starting at APM level ground level, then level 3, level 2, and ground. Drawings A-104 and A-105 show various sections of the APM/RAC interface.

5.1.2. Pedestrian Bridge Study Coordination

In December 2001, the Commission approved a contract allowing the airport to proceed with a planning study to evaluate conceptual alternatives for enhancing and/or replacing the existing pedestrian bridges connecting the Palm and Hibiscus parking garages to Terminals 2, 3, and 4.

Although this project is in its early design development stage, the designers are on board and the 2020 Vision team met regularly with the pedestrian bridge designers to interface the projects. The pedestrian bridge designers are choosing the optimum locations for the pedestrian bridges considering existing conditions at the face of the terminal buildings and considering the vertical circulation requirements at the terminals and at the garages. The 2020 team then positioned the people mover stations in accordance with those plans and RCT Engineering then recommended column locations and framing systems to interface the two projects. This was an iterative effort.

Drawings A-200 and A-201 show the people mover alignment and stations and how they might interface with the pedestrian bridge at Terminal 2. Drawings A-300 and A-301 show a similar layout for Terminal 3. The pedestrian bridge at Terminal 4 is not being advanced at this time (it needs to be coordinated with the floor plan of the new Terminal 4 and the Terminal 4 architects are not yet underway). Similar interfaces will be worked out with the Terminal 4 architects once they are under contract (projected to occur at the end of 2002).

5.1.3. *On-Airport Only System - Maintenance Facility*

An initial maintenance facility has been positioned just south of the Hibiscus garage (or on the east end of Terminal 4 for that alternate alignment option). Both locations are at the end of the APM line (see drawings C-1 and C-10). It is shown in detail on drawings A-501 and A-502. This facility will serve as the initial maintenance base if an “On-Airport” only system is constructed first. If the initial phase of the APM system links the Port and the Airport, then this facility would not be needed and a full yard and shop maintenance facility would be constructed initially.

Functions to be carried out at this initial facility include vehicle interior and exterior cleaning, removal and replacement of vehicle components, central control room operations, supervision offices, security offices and administration offices. A traction power substation will be located within the vicinity of the Maintenance building and the Terminal 4 station. It is envisioned that central control and administrative offices would be housed here for the ultimate system and vehicle cleaning and component repair would shift to the ultimate yard and shop location. This initial facility would still be used to store trains temporarily for converting peak to off-peak operations and for bad order trains as well. The track leading to this initial maintenance facility would then become a tail track.

5.2. OFF-AIRPORT SEGMENTS

The off-airport alignment follows public roads and rights-of-way prior to entering Port property (See drawings C-15 to C-25). Upon leaving the IMC, the alignment turns north and runs along the east side of NE 7th Ave. Further alignment refinements during the next phase of the project will determine if the columns will fit entirely within the roadway right of way.

The line then turns east and will run along the north side of Eller Drive. It is important that a right-of-way be preserved along Eller Drive and that column locations get coordinated with the Eller Drive Overpass project as mentioned in Section 3.3.3.2.

5.2.1. *Mid-Port Alignment*

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 (nos. 21 to 25). The guideway will pass through the parking garage occupying levels two and three necessitating a reconfiguration of the garage.

Should the people mover be constructed prior to construction of the new cruise ship terminals, then an interim station would be needed. This could be located within the Port's existing parking garage. Passengers would use existing pedestrian walkways to access the existing terminals.

5.2.2. *North-Port Alignment*

The alignment to North-Port currently has three options. The alignment could proceed north up either Eisenhower Blvd., SE 14th Ave. 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 Blvd alignment allows for placement of a station at Terminal 18. This station could also serve as an interim station for service to Mid-Port should the North-Port line be constructed first. Passengers would then be shuttled to Mid-Port. This alignment would also be more aesthetically pleasing and also avoid issues with locating guideway columns along an active railroad freight line. Only the Eisenhower alignment has been presented in the drawing set (drawings C-15 to C-25) and this alignment has been used for capital and operating cost estimates. Hence, the cost estimates include a station at Terminal 18 should the Eisenhower route be used and should the North-Port first alignment be constructed initially.

5.2.3. *Maintenance Yard and Shops*

A maintenance yard and shop has been located using the existing Hertz rent-a-car site. This assumes that Hertz will be relocating to the RAC and that this property may be available. The yard and shop could move either north or south depending on property availability, land use and other factors. Alternative maintenance sites should be studied in the PD&E phase. The yard and shop has been laid out for the ultimate fleet. This layout is shown in drawing A-500.

6. ESTIMATE THE RIDERSHIP DEMAND

6.1. ON-AIRPORT SEGMENT RIDERSHIP SUMMARY

Leigh Fisher and Associates performed Preliminary 2020 ridership projections. Their detailed methodology is presented herein. Tables 1 through 4 summarize their projections.

A summary of the On-Airport segment only is presented as follows:

TABLE 1 - ON-AIRPORT 2020 RIDERSHIP

Estimated Ridership, On-Airport People Mover Only 2020 Estimated Volumes - AM Peak				
	Station			
	Term 1/ RAC	Term 2	Term 3	Term 4
Boarding Train	1,051	0	0	0
Exiting Train	0	190	496	365
Passengers on Train	1,051	861	365	0

Hence, the On-Airport only system needs to be designed to serve 1051 passengers per hour in the peak. Maximum passenger capacity per vehicle ranges from 80 to 100 people per data supplied from the manufacturers. However, actual experience on these systems at other airports places this figure closer to 70 passengers per vehicle.

6.2. OFF-AIRPORT SEGMENT RIDERSHIP SUMMARY

Table 2 shows a summary of the estimated ridership projections for serving Mid-Port first, Table 3 shows the ridership if North-Port were served first and Table 4 shows the total system.

TABLE 2 - TOTAL SYSTEM 2020 RIDERSHIP FOR MID-PORT FIRST

Ridership Projections 2020 Estimated Volumes - AM Peak						
	Station					
	Midport	IMC	Term 1/ RAC	Term 2	Term 3	Term 4
From Mid-Port						
Boarding	4,992	4,401	1,051	0	0	0
Exiting	0	4,992	1,232	762	1,993	1,465
Passengers on Train	4,992	4,401	4,220	3,458	1,465	0

TABLE 3 - TOTAL SYSTEM 2020 RIDERSHIP FOR NORTH-PORT FIRST

Ridership Projections 2020 Estimated Volumes - AM Peak						
	Station					
	Midport	IMC	Term 1/ RAC	Term 2	Term 3	Term 4
From North-Port						
Boarding	3,328	3,569	1,051	0	0	0
Exiting	0	3,328	999	654	1,710	1,257
Passengers on Train	3,328	3,569	3,621	2,967	1,257	0

TABLE 4 - TOTAL SYSTEM 2020 RIDERSHIP

Ridership Projections 2020 Estimated Volumes - AM Peak						
	Station					
	Midport	IMC	Term 1/ RAC	Term 2	Term 3	Term 4
Total System						
Boarding	8,320	6,065	1,051	0	0	0
Exiting	0	8,320	1,698	978	2,559	1,881
Passengers on Train	8,320	6,065	5,418	4,440	1,881	0

The peak hour capacity for the total system is estimated to be 8320 people per hour with the highest ridership occurring at the IMC. From this information, fleet sizes can be calculated, operating plans can be recommended and cost estimates can be performed.

6.3. RIDERSHIP METHODOLOGY

6.3.1. Introduction

The following presents an overview of the methodology, source data and assumptions that were used in preparing the ridership projections for the Automated People Mover (APM) proposed as part of the 2020 Vision Program. Per current plans, the APM would extend from the terminal area at Fort Lauderdale/Hollywood International Airport (FLL) through the proposed Intermodal Center (IMC) and on to the cruise ship terminals at Port Everglades (PEV). In operation it would, in effect, have three main legs connecting between:

- FLL terminal area and the IMC with stops at Terminals 1, 2, 3 and 4
- IMC and Mid-Port at PEV with two stops in the Mid-Port area
- IMC and Northport at PEV with two stops in the Northport-area

The forecast year for ridership is 2020. By 2020, there are anticipated to be four primary APM user groups.

1. Multi-day cruise passengers traveling between FLL and PEV
2. Multi-day cruise passengers traveling between FLL and the Port of Miami
3. Air passengers going to/from FLL via the other modes (such as transit, bus, rail or IMC hotel) that transfers to the APM at the IMC.
4. On-airport Consolidated Rental Car (RAC)/Hotel patrons going/to from FLL terminal area

There is the potential for a fifth group being FLL terminal area employees parking at a remote facility east of the IMC and going to/from the FLL terminal area via the APM. However, their trips would peak at different times than passengers and therefore, would not be a factor from a fleet planning point of view.

Table 5 presents a summary of the ridership projections inbound to the IMC and the FLL terminal area and outbound from the FLL terminal area to the IMC and onto PEV. The following sections review how the peak hour flows by direction and the annual ridership

projections were derived for each user group followed by a summary of the estimated distribution of ridership on the various segments of the APM system.

TABLE 5 - RIDERSHIP PROJECTIONS, INBOUND AND OUTBOUND
INBOUND TO INTERMODAL CENTER & FLL TERMINAL AREA

Segment	Peak Hour	Peak Day	Annual
PEV to IMC			
Midport	4,992	12,480	1,350,000
Northport	3,328	8,320	900,000
subtotal	8,320	20,800	2,250,000
IMC to FLL			
PEV	4,160	16,640	1,800,000
POM	1,320	3,300	320,000
Other	585	5,310	1,600,000
subtotal	6,065	25,250	3,720,000
RAC/Hotel to 2,3 & 4	1,051	9,555	2,900,000
subtotal - on airport	7,116	34,805	6,620,000

OUTBOUND TO RAC, INTERMODAL CENTER & PEV TERMINALS

Segment	Peak Hour	Peak Day	Annual
2, 3 & 4 to RAC/Hotel	1,051	9,555	2,900,000
IMC to FLL			
PEV	2,496	12,480	1,350,000
POM	1,100	3,300	320,000
Other	585	5,310	1,600,000
subtotal	4,181	21,090	3,270,000
subtotal - on airport	5,232	30,645	6,170,000
PEV to IMC			
Midport	4,140	12,480	1,350,000
Northport	2,760	8,320	900,000
subtotal	6,900	20,800	2,250,000

6.3.2. PEV Cruise Passengers

It is anticipated that the largest APM user group during the peak hour will be multi-day cruise passengers traveling to/from Fort Lauderdale by air for their cruise trip out of PEV. The Port currently handles about 3 million cruise passengers annually. According to the PEV Master Plan, by 2020, the Port is projected to handle about 6.7 million annual cruise passengers of which about 65% or 4.5 million will be on multi-day cruises.

To better understand the peak period disembarking and embarking flows, it would be useful to first recap the typical multi-day cruise line operation from the time a ship arrives at the port, passengers disembark, a new set of passengers board and the ship leaves the port on a new cruise destination. Based on discussions with PEV staff, BCAD staff and a shuttle operator and field observations, the operation is understood to be as follows:

- Saturdays and Sundays are peak days
- Passengers leave their bags outside their cabins the night before arriving in port
- Multi-day ships arrive in Port early in the AM. (about 5 AM)
- Bags are retrieved by cruise line personnel and brought to U.S. Customs for inspection
- Passengers disembark all ships simultaneously between 8 AM and 10 AM, clear INS/Customs, claim their luggage and proceed to their destinations.
- Those leaving the area via FLL are transported to the airport by bus between 9 AM and 11 AM.
- Meanwhile ships are cleaned and restocked for their next trip.
- Cruise lines receive embarking passengers from 1 PM and 4 PM with 3PM to 4 PM being the heaviest boarding period. New cruise passengers arriving by air are transported from FLL to PEV during this time.
- Ships leave port from 5 PM to 7 PM.

From an FLL perspective, the typical flow of cruise passengers described above impacts airport facilities in several ways:

1. The two hour peak surge in cruise passengers arrivals overwhelms the processing capacity of FLL roadways, curbs and passenger check-in facilities
2. Cruise passengers have to wait up to 6 hours for their departing flight thereby impacting hold room and bag storage space.
3. Embarking cruise passengers arriving by air in the AM have to wait in the airport terminals until the cruise lines are prepared to receive outgoing passengers (starting around 1 PM).

As will be noted later, the 2020 program is designed to mitigate these impacts on FLL facilities and operations while providing users an improved level of service.

Turning to the peak flow estimates in the 2020 design year, the first step was to estimate the total volume of peak day cruise passengers. A peak period analysis in a previous study assumed that by 2020, the PEV Master Plan would be fully implemented, all berths at PEV would be occupied simultaneously with largest ship each could accommodate and all ships would carry 100% passenger loads. Follow-up discussion with PEV staff indicated that full build out; full berth and ship occupancy were reasonable assumptions from a facility-

planning standpoint. Applying the foregoing assumptions in Table 6 translates into a total of 64,000 peak day cruise passengers passing through PEV with 32,000 disembarking and other 32,000 embarking.

The next key operational assumption is that all FIS inspections that are now conducted at the individual Port Terminals would be consolidated at the IMC. Hence, all multi-day cruise passengers would have to be transferred on a sterile APM to the IMC for Federal Inspections, claim their bags which were transported separately and proceed to their destination. Given the large volume of multi-day passengers, it assumed that it could take up 2.5 hour to transfer these passengers to the IMC. Applying the above, the AM peak hour APM cruise passenger ridership from PEV to FLL would be as follows:

- Total daily passengers: 64,000
- 50% debarking: 32,000
- 65% multi day: 20,800
- Per hour over a two and half hours: 8,320

Per Table 6, about 60% would be on the leg from Mid-Port and 40% on the Northport leg of the system. After clearing FIS inspections, it is estimated that 80% of the multi-day passengers would then proceed onto the FLL terminal area for their trip home while the remaining 20% go either to local destinations (5%) or to Miami International Airport (15%).

Note, as an alternate, multi-day passengers may continue to clear FIS inspections at PEV. In this case, it assumed that 80% of multi-day passengers could be transferred in 2 hours from PEV to the IMC for their flight out of FLL yielding the same APM peak hour flow of 8,320 passengers per hour. Like the scenario above, their bags would be transported separately and these passengers would check-in for their flight at the IMC.

As noted above, due to the large volumes of passengers relative to the departing aircraft seats available, it is estimated that cruise passenger have to wait up six hours for their departing flights. This assumption was confirmed with BCAD staff. Hence, the IMC concept design provides for cruise passengers to check-in for their flights at the IMC, spend time in the IMC shops and restaurants and then proceed on the APM to the terminal area as their flight time nears. The peak period cruise passenger trips on the APM from the IMC to the terminal area are estimated to be distributed as follows:

- Total clearing customs: 20,800
- 80% go on to FLL terminals: 16,640
- 25% of total on to FLL in 1st hour: 4,160
- 25% 2nd hour: 4,160
- 15% 3rd hour: 2,496
- 15% 4th hour: 2,496
- 10% 5th hour: 1,664
- 10% 6th hour: 1,664

**TABLE 6 - CRUISE TERMINAL BERTH CAPACITY AT BUILDOUT
PORT EVERGLADES MASTER PLAN**

Terminal No.	Port	Planned Improvements	Mega Ship Capacity	Max Pax Capacity	Sub-total by Port	% Pax by Port
1	North	none		1,000		
2	North	none	1	3,000		
4	North	expanded	1	3,000		
Bi-level A	North	new	1	3,000	13,000	41%
Bi-level B	North	new	1	3,000		
18	Mid	none	1	3,000		
20	Mid	new	1	3,000		
22	Mid	new	1	3,000		
23	Mid	new		1,000		
24	Mid	link to 25	(a)	3,000		
25	Mid	link to 24	(a)			
26	Mid	none	1	3,000		
29	Mid	expanded	1	3,000	19,000	59%
Total Capacity one direction				32,000		
Total Daily Capacity				64,000		

Notes: (a) Option to have one mega ship at terminal 24/25 for a total of 10 megaship berths

Source: Port Everglades Master Plan - Element 6 - Section 2 - Aug 2001

The net 2020 Peak hour APM ridership for disembarking cruise passengers is:

- PEV to IMC: 8,320
- IMC to FLL terminal: 4,160

A similar analysis was performed for the outbound or embarking peak cruise passenger flows from FLL to PEV. In this case, all 20,800 embarking multi-day cruise passengers would check-in for their cruise trip at the IMC. However, as noted above, embarking cruise passengers transfer to the Port over a three-hour period and are therefore less peaked. This factor translates to 6,900 APM passengers per hour on the IMC to PEV leg.

Looking at the leg from the FLL terminals to the IMC, it is estimated that 60% of the embarking cruise passengers would come from FLL via the APM with 15% from MIA and 15% from area hotels and 10% from transit or other modes. Those from area hotels generally arrive the day before the start of their cruise and stay overnight. It is estimated that the 12,480 cruise passengers would arrive by air to FLL in the AM over a six-hour period and thus their transfers to the IMC via the APM would breakdown as follows:

- 60% from FLL terminals: 12,480
- 20% 1st hour: 2,496

- 20% 2nd hour: 2,496
- 20% 3rd hour: 2,496
- 15% 4th hour: 1,872
- 15% 5th hour: 1,872
- 10% 6th hour: 1,248

The net 2020 Peak hour APM ridership for embarking PEV cruise passengers is:

- FLL terminal to IMC: 2,496
- IMC to PEV: 6,900

On an annualized basis, PEV cruise passenger APM ridership breaks down as follows:

- PEV to IMC: 2.25 million - total disembarking passengers going to IMC
- IMC to PEV: 2.25 million - total embarking passengers going to PEV
- Total 4.5 million

- IMC to FLL terminal: 1.80 million - 80% continue on to FLL terminals
- FLL terminal to IMC: 1.35 million - 60% from FLL terminals to IMC
- 3.15 million

6.3.3. Port of Miami Cruise Passengers

Under current operations, disembarking cruise passengers from the Port of Miami (POM) are transported to FLL by bus for departing flights during the same period as PEV cruise line passengers while others arrive by air at FLL to embark on new cruise trips out of POM. Provisions have been in the IMC to handle these passengers. Disembarking POM cruise passengers will be transferred to the IMC via buses, check-in with their airline and proceed to their terminal at the appropriate time for their departing flight.

Like PEV passengers, the disembarking peak is projected to occur over a two-hour period and passengers will be waiting at the IMC up to 3 hours for their departing flight

- Total daily inbound passengers: 3,300
- 40% of total on to FLL in hour one: 1,320
- 40% 2nd hour: 1,320
- 20% 3rd hour: 1,320

Notes: Source and assumptions

- i. Based on BCAD Bus Counts, there are currently an estimated 1,650 inbound POM cruise passengers on the average peak day, peak season
- ii. Peak day, peak season inbound POM passengers are assumed to double by 2020 to 3,300.
- iii. Hourly distribution from IMC to Terminal
 LFA analysis: 40% 1st hour
 40% 2nd hour
 20% 3rd hour

On the outbound side, since embarking POM passengers have a longer connect time from FLL, it is assumed they have to arrive earlier for their cruise than PEV passengers and their arrivals would therefore be compressed over a three hour period as follows:

- Total daily outbound passengers: 3,300
- 33% of total on to FLL in hour one: 1,100
- 33% 2nd hour: 1,100
- 33% 3rd hour: 1,100

Based on BCAD bus counts over a recent 12-month period, there are currently an estimated 320,000 annual POM passengers passing through FLL going to/from the Port of Miami. As before, assuming a doubling by 2020, this user group would generate about 640,000 annual APM riders.

6.3.4. *Other Modes-Transit, Parking at IMC, IMC Hotel*

- 10% of peak hour enplanements: 585

Notes: Source and assumptions

- i. See Table 7 for estimate of peak hour enplanements in 2020
- ii. 5% mode share for long term parking & hotel @ IMC
- iii. 5% mode share for other modes

Since peak hour enplanements and deplanements are equivalent, the peak hour level of outbound passengers for this user group would be the same as above.

On an annual basis, this user group would generate about 3.2 million annual APM passengers.

6.3.5. *RAC/Airport Hotel to Terminal*

- 25% of peak hour FLL enplanements: 1,460

Notes: Source and assumptions

- i. See Table 7 for estimate of peak hour enplanements in 2020
- ii. 24% mode share for rental car users per 2000 Passenger Survey
- iii. 1% mode share for hotel
- iv. Only passengers bound for Terminals 2, 3 and 4 will board APM. Those going to Terminal 1 will cross over the Pedestrian Bridge to access the terminal.

Since peak hour enplanements and deplanements are equivalent, the peak hour level of outbound passengers for this user group would be the same as above.

On an annual basis, excluding passengers going to/from Terminal 1, this user group would generate about 5.8 million APM passengers.

6.3.6. *Passenger Distribution to APM System*

Inbound and outbound APM peak hour passengers were distributed on the various links on the system based on the seat distribution by terminal in Table 8 and the results appear in Table 9.

**TABLE 7 - CRUISE TERMINAL BERTH CAPACITY AT BUILDOUT
PORT EVERGLADES MASTER PLAN**

	Factor	2020
Enplanements		16,932,000
O&D	95%	16,085,400
Peak Month	10%	1,608,540
ADPM	3.3%	53,082
Peak Hour	11%	5,839
Mode- From IMC (Transit/Longterm Parking/Hotel)		
Peak	10%	584
Daily	10%	5,308
Annual	10%	1,608,540
Total Annual		3,217,080
To terminals - Peak Hour		
1	28%	163
2	13%	76
3	34%	199
4	25%	146
Mode - From RAC/Hotel		
Peak	25%	1,460
Daily	18%	9,555
Annual	18%	2,895,372
Total Annual		5,790,744
To Terminals - Peak Hour on APM		
1	28%	0 (a)
2	13%	190
3	34%	496
4	25%	365
Total on APM	72%	1,051

(a) Pax will use Ped Bridge to Terminal 1

TABLE 8 - ESTIMATED SEAT DISTRIBUTION BY TERMINAL AT BUILDOUT OF MASTER PLAN

TERMINAL	Aircraft type	No of gates	Seats per Acft	Seats	% of total seats
Concourse					
TERMINAL 1					
Concourse A					
	LOCKHEED L1011	5	287	1,437	
Concourse B					
	LOCKHEED L1011	1	287	287	
	BOEING 767-300/300E	1	227	227	
	BOEING 757-200	7	211	1,478	
Concourse C					
	LOCKHEED L1011	1	287	287	
	BOEING 767-300/300E	1	227	227	
	BOEING 757-200	7	211	1,478	
	Terminal 1 Total	23	236	5,422	28%
TERMINAL 2					
Concourse D					
	BOEING 757-200	2	211	422	
	LOCKHEED L1011	7	287	2,011	
	TERMINAL 2 Total	9	270	2,434	13%
TERMINAL 3					
Concourse E					
	BOEING 757-200	8	211	1,690	
	LOCKHEED L1011	8	287	2,299	
Concourse F					
	BOEING 757-200	6	211	1,267	
	LOCKHEED L1011	4	287	1,149	
	TERMINAL 3 Total	26	246	6,405	34%
TERMINAL 4					
Concourse G					
	LOCKHEED L1011	5	287	1,437	
	BOEING 747-400	3	377	1,131	
	BOEING 757-200	10	211	2,112	
	TERMINAL 4 Total	18	260	4,680	25%
AIRPORT TOTAL		76	249	18,940	100%

Notes

(a) Full build out assumptions

-- Ultimate 23 gates at terminal 1, 6 new gates provided at Terminal 3 w/"hockey stick addition"

-- Ultimate 18 gates at new Terminal 4 replacement

**TABLE 9 - CRUISE TERMINAL BERTH CAPACITY AT BUILDOUT
PORT EVERGLADES MASTER PLAN**

**Connections between FLL, IMC & PEV
Peak Direction**

Inbound to FLL						
	PEV	IMC	Term 1/ RAC/ Hotel	Term 2	Term 3	Term 4
Board	8,320	6,065	1,051	0	0	0
Off	0	8,320	1,698	978	2,558	1,881
On Train	8,320	6,065	5,418	4,439	1,881	0

Outbound to IMC					
	Term 4	Term 3	Term 2	Term 1/ RAC/ Hotel	IMC
Board	1,410	1,918	733	1,171	0
Off	0	0	0	1,051	4,181
On Train	1,410	3,328	4,061	4,181	0

Note: Cruise paxs accumulate at IMC
and go on to PEV later at rate of 6,900 Pax/Hour

7. DEFINE THE PRELIMINARY OPERATING PLAN

From the ridership information, a conceptual operating plan can be developed. This plan is presented herein.

7.1. ON-AIRPORT SEGMENT

Table 10 shows how the system might operate assuming an on-airport system is constructed first. This system would serve each of the Terminal buildings and provide access to each of the garages. It is assumed that a courtesy parking tram is located on the 4th level of the Palm garage and also serves the Hibiscus garage on the level 3. This provides passengers with shuttle service to each of the pedestrian bridges, which in turn connect to the people mover system. Details of this arrangement are included in the final

report for the exit roadway system, which describes potential phasing of construction that needs to occur with the pedestrian bridges and exit roadways.

TABLE 10 - OPERATING PLAN FOR ON-AIRPORT PEOPLE MOVER SYSTEM

Operating Plan for On-Airport People Mover System Terminal 4 to RAC Capacity: Two car trains, 5 min. Headways, 70 passengers/vehicle 140 passengers per train every 5 minutes = 1680 pph Assumed Station Dwell is 40 seconds							
Station	Time	Time	Distance	Train #	Distance	Avg.	Avg.
	Minutes	Seconds	feet		Between	Speed	Speed
					feet	fps	mph
Terminal 4	0.0	0	0	1			
Terminal 3	2.3	135	1350		1350	10	6.8
dwell	2.9	175	1350		0		
Terminal 2	4.0	240	2000		650	10	6.8
dwell	4.7	280	2000		0		
				2			
RAC	5.9	353	3450		1450	20	13.6
dwell	6.5	393	3450		0		
Terminal 2	9.0	538	4900		1450	10	6.8
dwell	9.6	578	4900		0		
				3			
Terminal 3	10.7	643	5550		650	10	6.8
dwell	11.4	683	5550		0		
Terminal 4	13.6	818	6900		1350	10	6.8
dwell	15.0	900	6900	1	0		
(extra 42 second dwell)							

This operating plan yields a fleet size of three 2-car trains for a total of six vehicles. They would operate on 5-minute headways in both directions providing a good level of service to the passenger. It is prudent to have two more vehicles as spares so that the system can be fully functional should one train set become disabled. It also allows for routine maintenance to occur during normal operating hours.

7.2. OFF AIRPORT SEGMENT

This conceptual APM system-operating plan was developed to determine the potential number of trains that would be needed for the APM system as it is phased between the Airport and the Port. The ridership projections indicate a needed capacity of 4992 passengers per hour (pph) if service to Mid-Port is initiated first and 5226 pph if the line initially goes to North-Port.

The preliminary operational analysis indicates that 24 3-car trains operating on 2-minute headways would meet the demand for the Mid-Port first scenario and 16 4-car trains operating on 3-minute headways will be required for the North-Port first scenario. This level of service will accommodate 6400 pph and 5600 pph respectively. This yields a fleet size of 72 and 64 vehicles respectively. Adding 2 spare train sets equates to a total fleet size of 78

and 72 vehicles. This figure includes the vehicles already assumed to be necessary for the On-Airport segment.

For the ultimate system, 24 4-car trains will operate on 2-minute headways corresponding to a fleet size of 96 vehicles. This will provide a capacity of 8400 pph. Adding 3 spare train sets produces a total fleet size of 108 vehicles. The peak capacities occur as the trains approach or depart from the IMC, the busiest part of the system. The operating analysis for both scenarios is shown in Tables 11 and 12.

**TABLE 11 - OPERATING PLAN -
AIRPORT TO MID-PORT FIRST**

Operating Plan for 2020 Vision People Mover Terminal 4 to Mid-Port First Scenario Capacity: Three car trains, 2 min. Headways, 70 passengers/vehicle 210 passengers per train every 2 minutes = 6300 pph Assumed Station Dwell is 40 seconds							
Station or Point	Time Minutes	Time Seconds	Distance feet	Train #	Distance Between feet	Avg. Speed fps	Avg. Speed mph
Terminal 4	0.0	0	0	1			
Terminal 3	2.3	135	1350	2	1350	10	6.8
dwell	2.9	175	1350		0		
Terminal 2	4.0	240	2000	3	650	10	6.8
dwell	4.7	280	2000		0		
RAC	5.9	353	3450	4	1450	20	13.6
dwell	6.5	393	3450		0		
IMC	8.0	483	5250	5	1800	20	13.6
dwell	8.7	523	5250		0		
end of curve	10.5	633	6350	6	1100	10	6.8
CCPT	11.9	716	8850		2500	30	20.4
dwell	12.6	756	8850	7	0		
WYE	14.5	870	13425	8	4575	40	27.2
end of curve	17.8	1070	15425	9	2000	10	6.8
dwell				10			
Mid Port # 1	19.5	1168	17375		1950	20	13.6
dwell	20.1	1208	17375	11	0		0.0
Mid Port #2	21.1	1268	18575	12	1200	20	13.6
dwell	21.8	1308	18575		0		0.0
Mid Port #1	22.8	1368	19775	13	1200	20	13.6
dwell	23.5	1408	19775		0		0.0
				16			
start of curve	25.1	1505	21725	15	1950	20	13.6
WYE	28.4	1705	23725	16	2000	10	6.8
CCPT	30.3	1820	28300	17	4575	40	27.2
dwell	31.0	1860	28300		0		
start of curve	32.4	1944	30800	18	2500	30	20.4
IMC	34.2	2054	31900	19	1100	10	6.8
dwell	34.9	2094	31900		0		
RAC	36.4	2184	33700	20	1800	20	13.6
dwell	37.1	2224	33700		0		
Terminal 2	39.5	2369	35150	21	1450	10	6.8
dwell	40.1	2409	35150	22	0		
Terminal 3	41.2	2474	35800		650	10	6.8
dwell	41.9	2514	35800	23	0		
Terminal 4	44.1	2649	37150	24	1350	10	6.8
dwell	48.0	2880	37150	1	0		
(extra 191 second dwell)							

The "Train #" column shown in Tables 11 and 12 indicate where the vehicles are on the system at a snapshot in time, spaced apart per the operating headway. Travel time from Terminal 4 to Mid-Port is estimated at about 21 minutes considering all station stops (assuming no layover at the IMC). From the IMC the trip is about 12.5 minutes to the end of the line.

TABLE 12 - OPERATING PLAN - AIRPORT TO NORTH-PORT FIRST

Operating Plan for 2020 Vision People Mover Terminal 4 to North-Port Scenario Capacity: Four car trains, 4 min. Headways, 70 passengers/vehicle 280 passengers per train every 3 minutes = 5600 pph Assumed Station Dwell is 40 seconds							
Station or Point	Time Minutes	Time Seconds	Distance feet	Train #	Distance Between feet	Avg. Speed fps	Avg. Speed mph
Terminal 4	0.0	0	0	1			
Terminal 3	2.3	135	1350		1350	10	6.8
dwell	2.9	175	1350	2	0		
Terminal 2	4.0	240	2000		650	10	6.8
dwell	4.7	280	2000		0		
RAC	5.9	353	3450	3	1450	20	13.6
dwell	6.5	393	3450		0		
IMC	8.0	483	5250		1800	20	13.6
dwell	8.7	523	5250		0		
end of curve	10.5	633	6350	4	1100	10	6.8
CCPT	11.9	716	8850		2500	30	20.4
dwell	12.6	756	8850	5	0		
WYE	14.5	870	13425		4575	40	27.2
start of curve	14.7	881	13850		425	40	27.2
				6			
Terminal 18	16.5	991	16050		2200	20	13.6
dwell	17.2	1031	16050		0		
end of curve	18.3	1101	17450	7	1400	20	13.6
NP#1	19.5	1170	20200		2750	40	27.2
dwell	20.2	1210	20200		0		
NP#2	22.7	1360	21700	8	1500	10	6.8
dwell	23.3	1400	21700		0		
				9			
NP#1	25.8	1550	23200		1500	10	6.8
dwell	26.5	1590	23200		0		
start of curve	27.6	1658	25950	10	2750	40	27.2
Terminal 18	28.8	1728	27350		1400	20	13.6
dwell	29.5	1768	27350		0		
end of curve	31.3	1878	29550	11	2200	20	13.6
WYE	31.5	1889	29975		425	40	27.2
CCPT	33.4	2003	34550	12	4575	40	27.2
dwell	34.1	2043	34550		0		
start of curve	35.4	2127	37050		2500	30	20.4
				13			
IMC	37.3	2237	38150		1100	10	6.8
dwell	37.9	2277	38150		0		
RAC	39.4	2367	39950	14	1800	20	13.6
dwell	40.1	2407	39950		0		
Terminal 2	42.5	2552	41400	15	1450	10	6.8
dwell	43.2	2592	41400		0		
Terminal 3	44.3	2657	42050		650	10	6.8
dwell	44.9	2697	42050	16	0		
Terminal 4	47.2	2832	43400		1350	10	6.8
dwell	48.0	2880	43400	1	0		
(extra 8 second dwell)							

Table 13 shows the operating plan for the total system. To meet the varying capacity requirements at Mid-Port and North-Port, one train would go to North-Port for every two-trains going to Mid-Port. This equates to service at North-Port every 6 minutes and service to Mid-Port occurring at 2, 2 and 4 minute cycles.

TABLE 13 - OPERATING PLAN FOR TOTAL SYSTEM

Operating Plan for 2020 Vision People Mover Ultimate System, Terminal 4 to North Port and Mid-Port Capacity: Four car trains, 2 min. Headways, 70 passengers/vehicle, 280 Pass. Per Train every 2 min. = 8400 pph Service to North-Port is every 6 minutes = 2800 pph, Mid-Port is ever 2 min, 2 min. & 4 min. = 5600 pph Assumed Station Dwell is 40 seconds																
Train to North Port								Train to Mid Port								
Station or Point	Time Minutes	Time Seconds	Distance feet	Train #	Distance Between feet	Avg. Speed fps	Avg. Speed mph	Station or Point	Time Minutes	Time Seconds	Distance feet	Train #	Distance Between feet	Avg. Speed fps	Avg. Speed mph	
Terminal 4	0.0	0	0	1				Terminal 4	0.0	0	0	x				
Terminal 3	2.3	135	1350	x	1350	10	6.8	Terminal 3	2.3	135	1350	2	1350	10	6.8	
dwell	2.9	175	1350		0			dwell	2.9	175	1350		0			
Terminal 2	4.0	240	2000	x	650	10	6.8	Terminal 2	4.0	240	2000	3	650	10	6.8	
dwell	4.7	280	2000		0			dwell	4.7	280	2000		0			
RAC	5.9	353	3450	4	1450	20	13.6	RAC	5.9	353	3450	x	1450	20	13.6	
dwell	6.5	393	3450		0			dwell	6.5	393	3450		0			
IMC	8.0	483	5250	x	1800	20	13.6	IMC	8.0	483	5250	5	1800	20	13.6	
dwell	8.7	523	5250		0			dwell	8.7	523	5250		0			
end of curve	10.5	633	6350	x	1100	10	6.8	end of curve	10.5	633	6350	6	1100	10	6.8	
CCPT	11.9	716	8850		2500	30	20.4	CCPT	11.9	716	8850		2500	30	20.4	
dwell	12.6	756	8850	7	0			dwell	12.6	756	8850	x	0			
WYE	14.5	870	13425	x	4575	40	27.2	WYE	14.5	870	13425	8	4575	40	27.2	
start of curve	14.7	881	13850		425	40	27.2									
				x								9				
Terminal 18	16.5	991	16050		2200	20	13.6	end of curve	17.8	1070	15425		2000	10	6.8	
dwell	17.2	1031	16050		0			dwell				x				
end of curve	18.3	1101	17450	10	1400	20	13.6	Mid Port # 1	19.5	1168	17375		1950	20	13.6	
NP#1	19.5	1170	20200		2750	40	27.2	dwell	20.1	1208	17375	11	0	0.0		
dwell	20.2	1210	20200	x	0			Mid Port #2	22.1	1328	19775	12	2400	20	13.6	
NP#2	22.7	1360	21700	x	1500	10	6.8	dwell	22.8	1368	19775		0	0.0		
dwell	23.3	1400	21700		0							x				
				13				Mid Port #1	24.8	1488	22175		2400	20	13.6	
NP#1	25.8	1550	23200		1500	10	6.8	dwell	26.5	1591	22175	14	0	0.0		
dwell	26.5	1590	23200	x	0			(extra 63 second dwell)								
start of curve	27.6	1658	25950		2750	40	27.2					15				
				x				start of curve	28.1	1688	24125		1950	20	13.6	
Terminal 18	28.8	1728	27350		1400	20	13.6	WYE	31.5	1888	26125		2000	10	6.8	
dwell	29.5	1768	27350		0			station Equation				x				
end of curve	31.3	1878	29550	16	2200	20	13.6	WYE	31.5	1888	29975		40	27.2		
WYE	31.5	1889	29975		425	40	27.2					17				
				x				CCPT	33.4	2003	34550		4575	40	27.2	
CCPT	33.4	2003	34550		4575	40	27.2	dwell	34.0	2043	34550	18	0			
dwell	34.1	2043	34550	x	0			start of curve	35.4	2127	37050		2500	30	20.4	
start of curve	35.4	2127	37050		2500	30	20.4					x				
				19				IMC	37.3	2237	38150		1100	10	6.8	
IMC	37.3	2237	38150		1100	10	6.8	dwell	37.9	2277	38150	20	0			
dwell	37.9	2277	38150	x	0			RAC	39.4	2367	39950		1800	20	13.6	
RAC	39.4	2367	39950		1800	20	13.6	dwell	39.4	2367	39950		0			
dwell	40.1	2407	39950	x	0			Terminal 2	42.5	2552	41400	x	1450	10	6.8	
Terminal 2	42.5	2552	41400	22	1450	10	6.8	dwell	43.2	2592	41400		0			
dwell	43.2	2592	41400		0											
								Terminal 3	44.3	2657	42050	23	650	10	6.8	
Terminal 3	44.3	2657	42050	x	650	10	6.8	dwell	44.9	2697	42050		0			
dwell	44.9	2697	42050		0			Terminal 4	47.2	2832	43400	24	1350	10	6.8	
Terminal 4	47.2	2832	43400	x	1350	10	6.8	dwell	48.0	2880	43400	x	0			
dwell	48.0	2880	43400	1	0			(extra 8 second dwell)								
(extra 8 second dwell)								(extra 8 second dwell)								

8. ESTIMATE THE CAPITAL COSTS

Conceptual cost estimates were then prepared using the fleet sizes derived from the operational analysis presented in Tables 10,11, 12 and 13. The cost estimates are shown in Tables 14 and 15 for the two alternate phasing implementation scenarios.

8.1. ON-AIRPORT SEGMENT

The On-Airport only system is estimated to cost \$150M in current year dollars.

8.2. OFF AIRPORT SEGMENT

Constructing the next phase to Mid-Port first would add another \$456M bringing a new subtotal to \$606M (\$150M+\$456M). Then going to North-Port add another \$274M bringing the total project cost to \$880M. The cost estimate shows that going to Mid-Port first would cost \$24M more than going to North-Port first. This is because the estimate assumes that going to Mid-Port first would incur the cost of an interim station at the Port's existing garage since, under this scenario, it is assumed that this would occur prior to the Port's reconstruction of the Mid-Port terminals.

Constructing the next phase to North-Port first would add \$496M bringing a new subtotal to \$646M (\$150M+\$496M). Then going to Mid-Port (without building an interim station) would add \$206M bringing the total project cost to about \$852M.

These figures present the breakdown of all known cost that will be incurred to produce a complete system. Right-of-way costs are assumed to be \$30M and this is a SWAG estimate. More analysis on total right-of-way needs is necessary.

TABLE 14 - CAPITAL COST ESTIMATE – MID-PORT FIRST SCENARIO

2020 VISION Conceptual Cost Estimate for People Mover - Mid-Port first Scenario Cost is in Millions, 2002 Dollars										
Description	Unit	Unit	On-Airport Segment		Off-Airport To Mid-Port first		Off-Airport To North-Port		Total	
		Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
Guideway (includes surveying, geotech, MOT, utility relocation, new utilities, trackwork, roadway reconstruction, property reconstruction, and demolition work)	miles	\$20	0.8	\$16.0	2.7	\$54.0	2.2	\$44.0	5.7	\$114.0
Premium cost for construction in airport environment	miles	\$10	0.8	\$8.0	0.6	\$6.0				\$14.0
Premium cost for column height and complexity (Ped, Tie ins etc.)	miles	\$5	0.8	\$4.0	1.5	\$7.5				\$11.5
Stations (exclusive of guideway)									11	\$158.0
Terminal 2, 3 & 4	each	\$10	3	\$30.0						
RAC	each	\$13	1	\$13.0						
IMC	each	\$20			1	\$20.0				
Cruise Ship Terminal 18	each	\$10					1	\$10.0		
North Port #1 and #2	each	\$15					2	\$30.0		
Mid Port #1	each	\$15			1	\$15.0				
Interim Station at Mid-Port	each	\$15			1	\$15.0				
Mid Port #2 + demolition of Interim Station	each	\$25					1	\$25.0		
Maintenance Facility and Equipment, Initial	LS	\$5	1	\$5.0						\$5.0
Maintenance Facility and Equipment, Full Build-out	LS	\$35			1	\$35.0				\$35.0
Yard Tracks and Lead, At-grade	LS	\$15			1	\$15.0				\$15.0
Central Control Facility and Equipment, Initial	LS	\$5	1	\$5.0						\$5.0
Central Control Equipment, Expansion	LS				1	\$1.0	1	\$2.0		\$3.0
Traction Power Substation (includes cabling and conduits to guideway)	each	\$1.5	1	\$1.5	2	\$3.0	2	\$3.0	5.0	\$7.5
Train Control, Traction Power, Platform Doors, Signalling and Comm., CCTV (security) and PA	miles	\$10	0.8	\$8.0	2.7	\$27.0	2.2	\$22.0		\$57.0
Total Fleet Size (cumulative)			8		78		108			
Vehicles, Warranty and Spare Parts	each	\$1.5	8	\$12.0	70	\$105.0	38	\$57.0	116	\$174.0
Testing and Start Up	LS			\$3.0		\$1.0		\$1.5		\$5.5
Training and Advertising	LS			\$1.0						\$1.0
Cost to Others, (permits, utilities, mitigation etc.)	LS			\$1.5		\$1.0		\$1.0		\$3.5
Subtotal				\$108.0		\$305.5		\$195.5		\$609.0
Design/Estimating Contingency	%	10%		\$10.8		\$30.6		\$19.6		\$60.9
Subtotal Construction				\$118.8		\$336.1		\$215.1		\$669.9
Design Builder Eng. & Const. Mgmt	%	12%		\$13.0		\$36.7		\$23.5		\$73.1
Subtotal Design and Construction				\$131.8		\$372.7		\$238.5		\$743.0
Art (2% of station costs)	%	2%		\$0.9		\$1.0		\$1.3		\$3.2
Project Reserve @ 5% of Construction	%	5%		\$5.9		\$16.8		\$10.8		\$33.5
BCAD Administration & PM/CM (lower for design build, contractor is CM)	%	4%		\$4.8		\$13.4		\$8.6		\$26.8
Change Order Allowance (lower for design/build)	%	5%		\$5.9		\$16.8		\$10.8		\$33.5
Procurement Documents	LS	\$6		\$1.0		\$3.0		\$2.0		\$6.0
Environmental Process	LS	\$4		\$0.0		\$2.0		\$2.0		\$4.0
Right of Way	LS			\$0.0		\$30.0		\$0.0		\$30.0
Total				\$150.3		\$455.8		\$273.9		\$879.9

TABLE 15 - CAPITAL COST ESTIMATE – NORTH-PORT FIRST SCENARIO

2020 VISION Conceptual Cost Estimate for People Mover, North-Port First Scenario Cost is in Millions, 2002 Dollars										
Description	Unit	Unit	On-Airport Segment		Off-Airport North-Port First		Off-Airport To Mid-Port		Total	
		Cost	Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
Guideway (includes surveying, geotech, MOT, utility relocation, new utilities, trackwork, roadway reconstruction, property reconstruction, and demolition work)	miles	\$20	0.8	\$16	3.6	\$72.0	1.3	\$25.9	5.7	\$113.9
Premium cost for construction in airport environment	miles	\$10	0.8	\$8	0.6	\$6.0				\$14.0
Premium cost for column height and complexity (Ped. Tie ins etc.)	miles	\$5	0.8	\$4	1.0	\$5.0	0.5	\$2.5		\$11.5
Stations (exclusive of guideway)									10	\$138.0
Terminal 2, 3 & 4	each	\$10	3	\$30						
RAC	each	\$13	1	\$13						
IMC	each	\$20			1	\$20.0				
Cruise Ship Terminal 18	each	\$10			1	\$10.0				
North Port #1 and #2	each	\$15			2	\$30.0				
Mid Port #1	each	\$15					1	\$15.0		
Mid Port #2	each	\$20					1	\$20.0		
Maintenance Facility and Equipment, Initial	LS	\$5	1	\$5						\$5.0
Maintenance Facility and Equipment, Full Build-out	LS	\$35			1	\$35.0				\$35.0
Yard Tracks and Lead, At-grade	LS	\$15			1	\$15.0				\$15.0
Central Control Facility and Equipment, Initial	LS	\$5	1	\$5						\$5.0
Central Control Equipment, Expansion	LS				1	\$2.0	1	\$1.0		\$3.0
Traction Power Substation (includes cabling and conduits to guideway)	each	\$1.5	1	\$1.5	3	\$4.5	1	\$1.5	5.0	\$7.5
Train Control, Traction Power, Platform Doors, Signalling and Comm., CCTV (security) and PA	miles	\$10	0.8	\$8	3.6	\$36.0	1.3	\$13.0		\$57.0
Total Fleet Size (cumulative)			8		72		108			
Vehicles, Warranty and Spare Parts	each	\$1.5	8	\$12	64	\$96.0	44	\$66.0	116	\$174.0
Testing and Start Up	LS			\$3		\$1.5		\$1.0		\$5.5
Training and Advertising	LS			\$1						
Cost to Others (permits, utilities, mitigation etc.)	LS			\$1.5		\$1.5		\$0.5		\$3.5
Subtotal				\$108.0		\$334.5		\$146.4		\$588.9
Design/Estimate Contingency	%	10%		\$10.8		\$33.5		\$14.6		\$58.9
Subtotal Construction				\$118.8		\$368.0		\$161.0		\$647.8
Design/Builder Eng. & Const. Mgmt	%	12%		\$13.0		\$40.1		\$17.6		\$70.7
Subtotal Design and Construction				\$131.8		\$408.1		\$178.6		\$718.4
Art (2% of station costs)	%	2%		\$0.9		\$1.2		\$0.7		\$2.8
Project Reserve @ 5% of Construction	%	5%		\$5.9		\$18.4		\$8.1		\$32.4
RCAD Administration & PM/CM (lower for design/build, contractor is CM)	%	4%		\$4.8		\$14.7		\$6.4		\$25.9
Change Order Allowance (lower for design/build)	%	5%		\$5.9		\$18.4		\$8.1		\$32.4
Procurement Documents	LS	\$6		\$1.0		\$3.0		\$2.0		\$6.0
Environmental Process	LS	\$4		\$0.0		\$2.0		\$2.0		\$4.0
Right of Way	LS			\$0.0		\$30.0		\$0.0		\$30.0
Total				\$150.3		\$495.8		\$205.8		\$851.9

9. DEFINE THE OPERATING STAFFING REQUIREMENTS AND FUNCTIONS AND ESTIMATE THE OPERATING COSTS

The 2020 Vision team engaged the services of Manual Padron and Associates to confirm operating plan scenarios and to estimate the staffing plan requirements and operating costs of the system. Their detailed report is presented in Appendix D and the summary is shown below.

9.1. ON-AIRPORT SEGMENT

The following table summarizes the peak APM vehicle requirements and total number of employees 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).

TABLE 16 - ON-AIRPORT SYSTEM OPERATING COSTS

Cost Centers	Phase 1 Airport Only
Peak/Fleet Vehicles	6 / 8
Total Employees	33
Total Annual O&M Costs	\$ 3.37 – \$ 3.96 M

9.2. OFF-AIRPORT SEGMENT

Should service to Mid-Port be implemented first, the operating costs would be phased as follows

TABLE 17 - TOTAL SYSTEM OPERATING COSTS WITH MID-PORT FIRST

Cost Centers	Phase 2 Airport to Mid Port	Phase 3 Airport to Mid Port and North Port
Peak/Fleet Vehicles	72 / 78	96 / 108
Total Employees	76	95
Total Annual O&M Costs	\$ 10.59 - \$ 12.46 M	\$ 14.09 - \$ 16.58 M

Should service to North-Port be implemented first, the operating costs would phased be as follows:

TABLE 18 - TOTAL SYSTEM OPERATING COSTS WITH NORTH-PORT FIRST

Cost Centers	Phase 2 Airport to North Port	Phase 3 Airport to North Port and Mid Port
Peak/Fleet Vehicles	64 / 72	96 / 108
Total Employees	74	95
Total Annual O&M Costs	\$ 10.34 - \$ 12.16M	\$ 14.09 - \$ 16.58 M

10. ASSESS THE VEHICLE TECHNOLOGY

There are many differing type of transit vehicles in use throughout the world. The differing vehicle type are design to accommodate the various system requirements such as: capacity, speed, vehicle floor plan (seats vs. standees), length of system, physical constraints (i.e. maximum length of platform and curvature), and for whom and what the system is intended to serve (airports, tourism, commuters etc.).

Most suppliers manufacture many different types of vehicles to meet the different needs of owners. The plan is to develop our own unique system requirements, provide this information in the form of procurement documents and the vehicle manufacturers will propose what they believe to be the best-suited vehicle to meet the need.

Vehicle technology will also be discussed in the PD&E phase of the project as a requirement of documenting the locally preferred alternative for the system. Following is a brief description of the most common types of vehicles in the industry.

10.1. PEOPLE MOVER:

A people mover is an automated transit vehicle that has been historically used at airports. It runs on an exclusive guideway, is controlled from a central control facility (the train is driverless), it runs on rubber tires on a concrete beam guided by under-car or side mounted rails, and it is entirely electric (there are some cable pulled systems (Otis) but they generally cannot be used in systems longer than one or two miles at most). The vehicle interior is generally an open floor plan with limited numbers of seats to accommodate passengers with baggage or carry-on items.

Most manufacturers continue to upgrade their line of vehicles to meet changing advances in technology. Bombardier currently is manufacturing their "Innovia" vehicle. This is the system currently being implemented at DFW. Mitsubishi also makes a number of different types of APM vehicles including one that is being installed for American Airlines in Miami (the Miami MIC/MIA APM supplier has not yet been chosen). Siemens also manufactures APM vehicles (Siemens purchase Matra who supplied the VAL system at Chicago O'Hare and has numerous lines in France in operation). Different flyers are included in the rear flap of this report.

These vehicles are very versatile and are specifically designed to meet the physical and operational requirements of airports. However, they have been applied to urban environments as well since their maximum capacity can serve the needs of moving people throughout and within a city. They are typically not used in between urban centers.

10.2. MONORAIL:

Use of monorail has been limited in the United States. Their capacity per length of vehicle is less than desirable since the vehicle width is narrower than most other transit vehicles since they operate on a single-wide guide beam. The longer the individual monorail vehicle (more capacity), the larger the turning radius needs to be. However, the slenderness of the vehicle does make it more visually attractive to many people.

New Jersey airport has a monorail vehicle but it is very short and holds only about 10-12 people per car. This was a result of meeting the physical requirements of the airport. Consequently, it operates very slowly with a speed that does not exceed about 10mph in actual use. By comparison, the “Disney” monorail has a minimum radius of 400-600 feet.

Monorail technology may be a candidate for this application but the proof will be in whether the supplier can meet the performance requirements of the system.

10.3. MAGNETIC LEVITATION:

“Maglev” technology has historically been applicable for high-speed, long distance corridors where the track is relatively straight. However, manufactures are currently designing vehicles for short haul urban applications. Energy consumption has been an issue in the past and this is being addressed in the industry. There is very limited number of suppliers for this as well and this may not be desirable when considering spare parts and extensions to the system. There may be see some competition and marketing from a magnet levitation supplier.

10.4. LIGHT RAIL:

Light rail intended use has typically been for medium capacity systems seeking low cost solutions to meet their transit needs. It typically runs at-grade in a street. It can either be in an exclusive right-of-way or run in mixed traffic. Many cities throughout the nation are turning to light rail to meet their needs. Light rail can be grade separated as well. Its popularity is in its versatility to meet the differing physical requirements of inter-city travel. This being exclusive guideways in an urban environment and street running once the system is reaches out to the suburban population where ridership is less and hence costs need to be scrutinized.

Light rail is powered by overhead lines, which is what allows it to run in the street. Overhead wires can be visually intrusive to some. There also may be a cost premium to customize a standard vehicle interior to accommodate the unique performance requirements for the proposed system (more of an open floor plan for passengers with baggage vs. a train designed for commuters).

10.5. HEAVY RAIL

Heavy rail (which refers to high capacity) is used in densely populated cities that have extremely high capacity demands. These systems (i.e. Metrorail in Miami and Washington DC, MARTA in Atlanta, BART in San Francisco) carry 200,000 to 400,000 people per day. These systems are electric powered by a third rail and can be fully automated although most owners choose to have an operator on board for operational and security reasons. This type of system would not be practical for this application.

10.6. COMMUTER RAIL

Commuter rail such as Tri-Rail are typically driven by diesel-powered locomotives that run in railroad corridors at grade in a push-pull mode. Commuter rail systems usually have stations at about 5-mile intervals to take into account their long acceleration and

deceleration requirements. They are typically used in inter-city applications with morning and evening service. This would not be practical for this application.

11. INVESTIGATE POTENTIAL IMPLEMENTATION SCENARIOS

The system will most likely be constructed in phases. An “On-Airport” segment could be built first that would link the terminals and the proposed RAC. Even this limited system would reduce congestion by eliminating the need for the multitude of car rental buses that traverse the airport roadways and it will integrate the system with the proposed reconstruction of the pedestrian overpasses and the RAC itself. As a result, this on-airport system can provide the means to help reduce pedestrian-vehicle conflicts that currently exist on the upper and lower level roadways. All of these improvements will reduce passenger travel times between terminals, free up limited curb space, and reducing vehicular emissions and as well.

However, a larger phase 1 system would be more prudent linking the Intermodal Center and Mid-Port directly to the airport in the initial phase. This could then be followed by a subsequent link to North-Port. Available funding will be a significant factor in terms of how and when the system is implemented. An initial system could be in service in 5 years if funding were available.

The system can be implemented in three phases:

Phase One: A 0.8 mile On-Airport system linking all of the terminals and the RAC

Phase Two: Extension to Mid-Port

Phase Three: Extension to North-Port

11.1. ON-AIRPORT SEGMENT

The on-airport APM segment will consist of an elevated guideway structure that will be routed within a corridor between the parking garages and the double-decked terminal roadways with the potential option of going directly into the proposed Terminal 4. One APM station per terminal will provide adequate levels of service for the forecasted ridership demand. 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.

This segment is shown on drawing C-00. If only the “On-Airport” portion is constructed first, then the system would terminate just east of the RAC station since until such time as the Intermodal Center is construction and the line is extended to either Mid-Port or North-Port or both.

11.2. OFF-AIRPORT SEGMENT

11.2.1. Serving Mid-Port First.

Building the system to Mid-Port first would serve the largest number of cruise passengers since there are more cruise terminals at Mid-Port. However, Port Everglades’ Master Plan

has the improvements being built at North-Port first. Staging the two programs together would be ideal from a construction and construction cost point of view.

The Port's new terminal construction must precede the people mover construction at the last station since the ultimate plan is to have people mover station in the middle of the new cruise terminals serving terminals 21, 22 23, 24 and 25. It is not physical practical y to build the APM station first.

The following describes that advantages and disadvantage of the two scenarios.

11.2.1.1. ADVANTAGES OF THIS SCENARIO

- Provides a direct connection to Mid-Port first capturing a higher percentage of the total ridership initially.
- Provides a shorter alignment for the first phase which will be less expensive and therefore result in a better initial benefit to cost ratio.
- An Interim station makes use of existing pedestrian bridges at the Mid-Port garage for passenger flow to existing cruise terminals.

11.2.1.2. DISADVANTAGES OF THIS ALTERNATIVE

- Requires construction of an interim station at Mid-Port since implementing this segment first would most likely precede the build out of the new terminal arrangement at Mid-Port. The final station would occur later at the time of the Mid-Port build-out. This station could be located at and within the existing parking garage at Mid-Port.

11.2.2. *Serving North-Port First*

This scenario would be more consistent with Port Everglades' Master Plan, which has new cruise terminals and berthing facilities being construction at North-Port first (for construction staging reasons). These facilities are needed first to allow for cruise ships to go to North-Port while Mid-Port is under construction.

11.2.2.1. ADVANTAGES OF THIS SCENARIO

- Is more consistent with Port Everglades' Master Plan phasing.

11.2.2.2. DISADVANTAGES OF THIS SCENARIO

- Does not provide a direct connection to Mid-Port for the first extension of the people mover to Port Everglades. However, an APM station at Terminal 18 (per the line that goes up Eisenhower Blvd.) could serve as a temporary station until Mid-Port is build. A shuttle bus system would have to be used to carry people from Terminal 18 to Mid-Port.

12. FEDERAL FUNDING POSSIBILITIES

It is assumed Federal funding will be sought after and sources of funds may come from multiple agencies within the federal government such as the Federal Aviation Administration (FAA), the Federal Highway Administration (FHWA) and the Federal Transit Agency (FTA). A necessary first step will be to identify which agency would act as the lead agency. Federal grants and/or loan programs for 2020 Vision projects would be subject to the respective agency's environmental and public process. In any event, we recommend that whoever is the lead agency; the environmental process should meet all of the requirements of all of the respected agencies to give the County the greatest flexibility to seek Federal participation for funding the project.

No matter who the lead agency is (FHWA, FTA or the County), the project will need to satisfy National Environmental Policy Act (NEPA) requirements through an environmental process. According to the FDOT PD&E Manual, the Federal Highway Administration (FHWA) usually serves as the lead Federal agency for NEPA compliance. "On rare occasions, other Federal agencies, such as FTA, FRA, and the FAA may become the lead federal agency upon consultation and written agreement with FHWA and the Department. Where the lead federal agency is an agency other than FHWA, the policies and procedures for complying with NEPA should be included in the agreement."

The FDOT PD&E Manual also states that other local government or regional transportation authorities can serve in the role of lead State agency, but "FHWA will generally request FDOT to assist these governmental entities by acting as a program administrator for environmental document compliance with NEPA". The Manual also states that anytime the Department "prepares and processes, or assists in the processing of, an environmental document to comply with NEPA, the standard used for the document development and processing will be the PD&E Manual. This requirement is based on an informal agreement between the Department and FHWA as expressed in the Local Agency Program Manual of the Department for federal funding purposes."

As part of the study process, a "Class of Action Determination" will be made in consultation with FHWA. It appears that the Class of Action Determination for the APM and IMC could be the requirement for an Environmental Impact Statement (EIS) rather than an Environmental Assessment (EA). The PD&E Manual states that fixed rail transit facilities normally require an EIS (vs. an EA).

The Manual also advises, "for multi-modal projects, FTA should be consulted early in the development process. Depending on the extent of FTA involvement and the possible use of FTA funds for portions of the proposal, the need to request FTA to be lead agency or cooperating agency should be considered at the earliest stages of project development. The need for FTA coordination should be established through consultation with FHWA".

In addition, based on the Miami experience in funding a very similar program, they found that working through FHWA was the most prudent course of action given the multi-modal nature of the program combined with the potential success in securing funding.

It will also be important to reach consensus with agency partners such as Port Everglades, Tri-Rail, MPO, Broward County and FDOT to maximize the opportunities for obtaining federal grants/loans and to speak with one voice.

Because of the tragic events of September 11th, there could also be an opportunity now to showcase 2020 Vision projects such as the APM and the IMC as demonstration projects to enhance security between the airport and the Port. The IMC is also a facility that improves regional mobility, inter-modal connections and provides economic development opportunities for the surrounding communities. If the program could be deemed a “Project of Regional or National Significance”, the potential for capturing federal funding may be greatly increased.

13. NEXT STEP, THE ENVIRONMENTAL PROCESS

The section summarizes the potential environmental study and funding eligibility requirements for the “off-airport property” portion of a potential people mover project serving the Fort Lauderdale/Hollywood International Airport. If the proposed people mover will require the use of federal or state funding or permits then it will be subject to federal and state environmental laws and funding requirements as shown in Table 19. Even if the project is to be funded only with state and local funds, it may require federal permits for construction triggering the need to be in compliance with the federal National Environmental Policy Act (NEPA). Similarly, projects funded entirely by local jurisdictions require compliance with state environmental laws and regulations.

A key factor in determining the appropriate approach to addressing the environmental compliance requirements when federal funding or permits are being sought is which federal agency is designated as the lead agency. For the People Mover Project the most likely lead agency would be the Federal Highway Administration (FHWA), but it is possible that the Federal Transit Administration (FTA) or the Federal Aviation Authority (FAA) could be identified as the lead agency. If FTA is the lead agency then the FTA guidance regarding NEPA would be most appropriate. If FHWA is the lead agency then they will likely rely on FDOT oversight and the state P, D, &E process (which is the state’s interpretation of NEPA) would be most appropriate. If FAA is the lead agency then environmental study requirements used for airport facilities would be appropriate. Therefore, early coordination between FTA, FHWA, FAA, and FDOT to determine the likely lead agency is a key milestone in determining the approach to meeting environmental study requirements for the project.

The New Starts process, which is applicable to projects that are seeking more than \$25 million in federal capital funding, require that the project is fully in compliance with NEPA requirements. The state Project Development & Environmental (P, D, &E) process addresses both federal (NEPA) and state requirements. However, the State Environmental Impact Report (SEIR) process does not necessarily meet all of the requirements of NEPA, thus this process would only be used if it were certain that no federal funds or permits would be required. All projects that require the use of public funds need to be included in the MPO Cost Feasible Long Range Transportation Plan and Transportation Improvement Program (for any actions within a five year time period). If state administered funding is required within the next five years, then the project also needs to be included in the State Transportation Improvement Program.

TABLE 19 - COMPLIANCE WITH ENVIRONMENTAL AND FUNDING ELIGIBILITY REQUIREMENTS

	PROJECT FUNDING AND PERMITTING SOURCE(S)			
	Federal (>\$25M Federal Funds)	Federal (<\$25M Federal Funds)	State (No Federal Funds or Permits)	Local (No Federal Funds or Permits)
ENVIRONMENTAL CLEARANCE				
National Environmental Policy Act (NEPA)*				
Project, Development & Environmental (PD&E)**				
State Environmental Impact Report (SEIR)***				
Non-Major State Action***				
FUNDING ELIGIBILITY				
Section 5309 New Starts Program				
State Transportation Improvement Program				
MPO Long Range Transportation Plan and Transportation Improvement Program				

* - Most Appropriate if FTA is the Lead Agency

** - Most Appropriate if FHWA is the Lead Agency

*** - Either SEIR or Non-Major State Action (not both) depending on project determination by FDOT. People Mover Project would likely require SEIR rather than Non-Major State Action.

The major environmental study and funding eligibility requirements are described as follows. Following these descriptions a possible overall approach to ensuring the maximum flexibility for environmental compliance and funding eligibility for the proposed people mover project is presented.

13.1. NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) REQUIREMENTS

If the proposed people mover project is seeking any federal funding or permitting, then the project will have to be in compliance with the National Environmental Policy Act (NEPA). This would likely require the preparation of an Environmental Impact Statement (EIS) and ultimately the issuance of a Record of Decision (ROD) by FTA that confirms that NEPA requirements have been met. The following paragraphs provide a brief overview of the NEPA process for major transit projects.

The National Environmental Policy Act of 1969 is our basic national charter for the protection of the environment. The Council on Environmental Quality (CEQ) has set forth regulations to implement the provisions in the act. These procedures ensure that environmental information and potential consequences of a proposed project is made

available to the public officials and citizens before decisions are made and actions are taken. The NEPA process is intended to help public officials make decisions that are based on an understanding of the consequences, and take actions that protect, restore, and enhance the environment. The NEPA process incorporates the requirements of a number of federal laws and regulations including: National Historic Preservation Act of 1966, Federal Clean Air Act of 1990, and Section 4(f) of the Department of Transportation Act of 1966, which addresses the protection of parks, recreational lands, and historically significant properties.

An early step in the NEPA process is the determination of the appropriate Class of Action; Categorical Exclusion (CE), Environmental Assessment (EA), or Environmental Impact Statement (EIS). A federally funded people mover project would likely require the preparation of an EA and/or EIS. A CE is pursued when a project doesn't include major construction activities. An EA is prepared when the significance of the environmental impacts are not clearly known. An EA can lead either to the preparation of an EIS or a Finding of No Significant Impact (FONSI). If as a result of the EA, it is that an EIS will be required, then an EIS is prepared. It may be determined from the outset that an EIS will be required and an EA would not be necessary. In this case the project would be advanced directly into the EIS process.

The EIS includes the development and consideration of a range of alternatives that includes No-Build, Transportation Systems Management (TSM), and Build Alternatives. The No-Build alternative includes existing and committed transportation improvements in the area but does not include the proposed transit project. The TSM alternative includes the No-Build improvements plus low capital cost options such as improved bus service in the study area, but does not include the proposed transit project. The build alternative(s) includes the No-Build improvements plus the proposed transit project.

The EIS identifies the potential environmental consequences for each of the alternatives relative to a number of social, environmental, economic, and transportation factors. The specific factors that are evaluated in the EIS are identified early in the process as part of the scoping phase. The scoping decisions include the review and participation of affected agencies, interested organizations, and the general public.

The EIS process results in the identification of a Locally Preferred Alternative (LPA). The EIS documentation and results are then reviewed by the Federal Transit Administration and a Record of Decision (ROD) is issued which closes the NEPA process.

13.2. STATE PROJECT DEVELOPMENT AND ENVIRONMENTAL (PD&E) REQUIREMENTS

The State of Florida has developed a process by which transportation projects are developed to meet the requirements of various federal, state, and local laws and regulations. The process addresses the project development, engineering, public involvement, and environmental requirements. The process was developed to address federal NEPA requirements as well as state requirements. It is important to note that the P, D, &E process was designed primarily for highway projects. There is the potential for some unique environmental issues for major transit projects that aren't necessarily clearly addressed in the P, D, &E process. Special transit issues of concern include ridership, operating costs, cost efficiency, station area development, bus transit operations, parking at stations, and pedestrian access. Typically major federally funded transit projects follow the

Federal Transit Administration (FTA) Guidance relative to NEPA compliance rather than the P, D, &E process.

The state P, D, &E process is documented in the two-volume FDOT Project Development and Environment Manual. The P, D, &E Manual addresses:

- Advance Notification Requirements
- Class of Action Determination
- EA and/or EIS Development
- Public Involvement
- Project Development
- Environmental Permits
- Re-evaluations
- Corridor Preservation

13.3. STATE ENVIRONMENTAL IMPACT REPORT (SEIR) OR NON-MAJOR STATE ACTION REQUIREMENTS

The preparation of a State Environmental Impact Report is required under F.S. 338, 339 and as implementation under the Florida Transportation Plan when funds other than federal funds are used to develop and construct a major transportation project. This includes all major transportation projects for which bond, local, state, and private monies are used and administered. The SEIR process is superseded by the NEPA and State P, D, &E process and is only used when it is certain that no federal funding or permits will be required. The determination of whether the project is a “major transportation project” is completed by the Florida Department of Transportation (FDOT). Major transportation projects typically include new transportation facilities, interchanges, and aerial structures. It is likely that a people mover project would be considered a major transportation project. The SEIR evaluates the direct and indirect impacts of the proposed project on the surrounding community.

Projects that are not identified as major transportation projects are determined to be Non-Major State Actions (NMSA) and are excluded from the SEIR process. However, at the discretion of FDOT, the SEIR process may still be used if there is environmental controversy surrounding the project.

13.4. SECTION 5309 NEW STARTS PROGRAM REQUIREMENTS

There are a large number of major fixed guideway transit projects that are seeking capital funding under the USDOT Section 5309 New Starts Program. Given that this is a discretionary funding program and there are limited funds available, candidate project must compete with each other for funding. FTA requires that each project submit specific project information every year that is used as a basis for determining whether the project will be recommended for funding. The criteria used for the project rating include the following:

- Mobility Improvements
- Environmental Benefits
- Operating Efficiencies
- Cost-Effectiveness
- Transit Supportive Land Use Implications

- Stability and Reliability of Capital Financing Plan
- Stability and Reliability of Operating Financing Plan

The results of the evaluation are published in an annual report to the US Congress and are used as a basis for determining whether a project is recommended or not recommended for funding. Although a project may receive a “not recommended” rating early in the project development process, it can continue to submit updated information annually as the project development process progresses and could potentially receive a “recommended” rating in later phases of project development.

13.5. MPO LONG RANGE TRANSPORTATION PLAN (LRPT) AND TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

The Long Range Transportation Plan (LRTP) identifies all of the major surface transportation projects planned for the area in the next twenty years. This includes both roadway and transit improvements. The local Metropolitan Planning Organization (MPO) updates the LRTP every three years. The LRTP process results in the development of the Cost Feasible Transportation Plan that includes only the improvements that are affordable given the revenues that can reasonably be expected to be available for transportation projects over the twenty-year period. If a transportation project is to be funded with federal, state, or local public funds it needs to be included in the Cost Feasible Long Range Transportation Plan.

The MPO also develops the short-range (five year) Transportation Improvement Program (TIP). If federal, state, or local funds are to be used to study, design, or construct a project it must be included in the TIP.

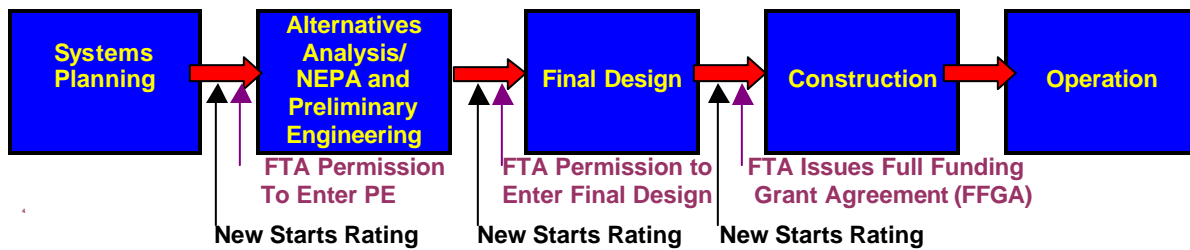
13.6. STATE TRANSPORTATION IMPROVEMENT PROGRAM

For projects that are funded at the state level or if the federal funds for a project are administered by the state, then the project needs to be included in the five year State Transportation Improvement Program (STIP). The STIP is developed by FDOT and is updated annually.

13.6.1. Overall Process for Development of a Project Seeking more than \$25 Million in Federal New Starts Funding and FTA is the Lead Agency

A project the size and scope envisioned for the people mover project would likely be classified as a major transportation project. Since it has not yet been determined whether the project will require federal or state funds or permits or whether more than \$25 million in federal funds would be required, it may be desirable to position the project to meet the federal level NEPA and federal level New Starts requirements.

The chart on the following page shows the major steps in the project development process for projects seeking more than \$25 million in federal capital funding under the New Starts Program.



The process begins with the Systems Planning Phase which identifies and evaluates the project concept, service area, estimated cost, ridership potential, potential funding sources and other factors identified by project stakeholders and participants. This phase concludes with the incorporation of the recommended project into the adopted Metropolitan Planning Organization (MPO) Cost Feasible Long Range Transportation Plan (LRTP).

Upon completion of the System Planning Phase the project sponsors would be required to submit detailed information about the project to FTA for comparison to other projects seeking federal funding under the Section 5309 New Starts program. Based on this detailed project information the project is rated and the results are published in an annual report to the U.S. Congress. Based on the results of the project ratings FTA determines whether to grant permission for the project to advance into the NEPA/Preliminary Engineering Phase of project development. In recent years it has become increasingly difficult for a project that does not have binding commitments for the non-federal share of project funding, to obtain FTA permission to enter Preliminary Engineering.

If FTA permission to enter Preliminary Engineering is granted, then project design and engineering to a level sufficient to complete the environmental work and to refine the cost estimates can be initiated. Based on the size and scope of the project either a Draft Environmental Assessment (EA) or Draft Environmental Impact Statement (EIS) is also completed to meet the requirements of NEPA. The Draft EA/EIS includes the identification of a Locally Preferred Alternative (LPA). This phase concludes with the development of a Final EA/EIS, which is forwarded to FTA for a Record of Decision (ROD).

Based on an updated New Starts project rating, FTA then determines whether to grant permission for the project to enter Final Design. Upon completion of the Final Design phase and further updates of the New Starts project ratings the FTA may issue a Full Funding Grant Agreement (FFGA), which commits the federal government to fund the federal share of the project costs. The decision to establish an FFGA is based on the performance of the project against the New Starts criteria relative to other projects seeking federal funds.

13.6.2. Overall Process for Development of a Project Seeking more than \$25 Million in Federal New Starts Funding when FHWA is the Lead Agency

If the project is seeking federal funding and FHWA is the lead agency, then FDOT’s P, D, & E process would be the most appropriate approach for addressing the environmental requirements of the project. The major steps in the process are highlighted as follows.

13.6.2.1. ADVANCE NOTIFICATION

The advance notification process is the means by which other federal, state, and local agencies are informed of a proposed project and gives notice of FDOT's intent to apply for federal-aid on a project. The advance notification process is initiated at the commencement of the Preliminary Engineering phase of the project. It begins with the preparation of the advance notification package by the District Environmental Management Office (DEMO) and is forwarded to the State Clearinghouse in the DCA. Copies of the package are also sent to the local Regional Planning Council (RPC), South Florida Water Management District, and other local, state, and federal agencies. A minimum 45-day comment period is initiated for distribution and receipt of agency responses. Comments are received and integrated into project development. As part of this process the DCA will issue a determination of the project's consistency with the Florida Coastal Zone Management Program (CZMP) (if applicable). If the project is inconsistent with the CZMP or includes obvious controversial environmental issues the project is referred to the Environmental, Community, and Economic Development Policy Unit of the Governor's Office of Planning and Budget for mediating potential conflicts and providing a State Process Recommendation (SPR).

13.6.2.2. CLASS OF ACTION DETERMINATION

The decision as to what type of environmental documentation is appropriate or whether or not a project is categorically excluded from NEPA is made in consultation with FHWA. A special Environmental Determination Form (No. 508-01) documents the type of environmental evaluation the project should follow. The class of action options includes Categorical Exclusion (CE), Environmental Assessment (EA), and Environmental Impact Statement (EIS). The appropriate class of action is determined in by a coordinated effort between FHWA and DEMO.

13.6.2.3. ENVIRONMENTAL ASSESSMENT

An Environmental Assessment (EA) is prepared if it was identified as the appropriate class of action. Concurrent with the preparation of an EA, a public involvement program is developed and administered. The EA addresses the potential impacts of the project relative to:

- Social and Economic Impacts
- Cultural and Historical Resources
- Natural and Physical Impacts

The document also describes the proposed action, project need, alternatives considered, comments received, and agency coordination.

The EA is forwarded to FHWA for approval along with supporting documents (i.e. Noise Report, Air Quality Report, Conceptual Stage Relocation Plan, Contamination Screening Evaluation Report, Engineering Report, Wetland Evaluation Report, and Endangered Species Biological Assessment).

Upon approval the FDOT District prepares a Notice of Availability, which is published in the local newspaper. A public hearing is scheduled. The document is made available for public

review at least 21 days in advance of the hearing. After the public hearing, a Finding of No Significant Impact (FONSI) (if appropriate) is prepared. If significant impacts are anticipated, a Draft Environmental Impact Statement (DEIS) may be prepared.

13.6.2.4. ENVIRONMENTAL IMPACT STATEMENT

If as a result of the Environmental Determination Process or the completion of an EA it is determined that an EIS is required, the FHWA publishes a Notice of Intent to Prepare an EIS in the Federal Register. Concurrent with the preparation of an EIS, a public involvement program is developed and administered.

The EIS includes the following information:

- Purpose and Need for Action
- Alternatives Including the Proposed Action
- Affected Environment
- Environmental Consequences
- Comments and Coordination
- List of Preparers
- List of Agencies and Organizations and Persons to Whom the Document is Sent

The environmental consequences element include potential impacts relative to:

- Social and Economic Impacts
- Cultural and Historical Resources
- Natural and Physical Impacts

The EIS is forwarded to FHWA for approval along with supporting documents (i.e. Noise Report, Air Quality Report, Conceptual Stage Relocation Plan, Contamination Screening Evaluation Report, Engineering Report, Wetland Evaluation Report, and Endangered Species Biological Assessment). Upon approval the FDOT District files the approved DEIS with the US Environmental Protection Agency and its availability is published in the Federal Register and a 45-day comment period is established. The document is also distributed to federal, state, and local agencies and organizations for review. The FDOT District prepares a Notice of Availability, which is published in the local newspaper. A public hearing is scheduled. The document is made available for public review at least 21 days in advance of the hearing.

After the public hearing a Final EIS is prepared addressing all of the comments received on the Draft EIS. The Final EIS is submitted to the FHWA and the US Environmental Protection Agency and a Notice of Availability is published in the Federal Register. After a 30-day period the FHWA may sign a Record of Decision (ROD), which closes the EIS process.

13.6.2.5. PROJECT DEVELOPMENT

The project development process involves the collection of information and data, the development of engineering alternatives, the evaluation and comparison of the alternatives, and the documentation of engineering decisions and recommendations. The intent of the

process is to develop the project to a level of detail necessary to accurately assess the economic and environmental impacts through the application of preliminary engineering and environmental science.

An initial step in this process is the preparation of a Project Concept Summary. A Preliminary Engineering Report is also required to document the engineering analysis and decisions and to support the findings in the environmental document. A Location Hydraulics Report is also required.

13.6.2.6. ENVIRONMENTAL PERMITS

The Florida Department of Transportation activities are regulated under many environmental rules and regulations administered by Federal, State, County, and local agencies. Construction activities requiring permits include:

- Dredge and Fill
- Storm water Discharge
- Pollution Discharges into Ground waters
- Bridges and Causeways
- Pile Jackets and Bridge Replacements

The FDOT District is responsible for identifying potential permit involvement early in the project development process. FDOT may also prepare a Permit Coordination Package to facilitate issue identification and resolution. The package is distributed to affected agencies and provides sufficient conceptual information on the project, defines potential permitting problems, and identifies ways in which the project could be made more acceptable for permitting. After the public hearing, the issuance of a FONSI or ROD, and the initiation of final design, the project may apply for the appropriate permits.

13.6.2.7. RE-EVALUATIONS

After approval of the EA, EIS, or CE designation, the applicant project must consult with FHWA prior to requesting any major approvals or grants to establish whether or not the approved environmental document or CE designation remains valid for the requested action. The re-evaluation process serves to ensure project compliance with all applicable federal and state laws prior to the advancement of the project to the next major production phase (preliminary engineering, right-of-way acquisition, or construction advertisement). The re-evaluation process also provides the mechanisms whereby commitments made by the Department during project development are identified or updated. Any new commitments or laws, which may have come into effect since the approval of the original environmental documents or designations, are also addressed in the re-evaluation.

The re-evaluations contain a finding, which indicates whether or not the changes that have occurred are significant. If the re-evaluation indicates that there are new significant impacts then a Supplemental or new EIS may be required.

13.6.2.8. CORRIDOR PRESERVATION

The Department has established procedures to designate corridors for advance right-of-way preservation. These procedures include the following:

- Designating Corridors in the Florida Transportation Plan (FTP)
- Advance Acquisition of Right-of-way
- Include on the Roadway Corridor Official Map

13.6.3. *Overall Process for Projects when it is certain that No Federal Funding or Permits will be sought*

If it is certain that no federal funds or permits will be sought then the project would be positioned for a State Environmental Impact Report (SEIR). At the initiation of the process, FDOT determines whether or not the project constitutes a major state action. A People Mover Project would most likely be determined as a major state action. At this point, an Advance Notification Package would be prepared and circulated. The development of the SEIR would then be initiated to evaluate the impacts of the proposed project. Once the SEIR has been developed, FDOT District 4 must perform a quality control review of the document to ensure that the project complies with the appropriate laws and the FTP. All support documentation including an Engineering Report, Noise Study Report, Air Quality Report, Conceptual Stage Relocation Plan, Contamination Screening Evaluation Report, or any other applicable supporting technical report must be contained in the project file. Once FDOT District 4 is satisfied that the SEIR meets all of the requirements, the document is signed by the District Secretary and made available to the public for public hearing purposes. For those projects that the FDOT District determines will have a significant environmental impact the District may opt to prepare the SEIR similar in scope and format to an EIS.

After the public hearing, the public record is held open for a period of at least 10 days to ensure that all comments from the public are received. The District prepares a transcript of the hearing proceedings and begins review of the SEIR to address the comments received. Once the document has been finalized, the District Secretary signs and approves the SEIR. The final document and transcript are placed in the project file with a copy of the approved SEIR (including the Engineering Report) and sent to the Central Environmental Management Office (CEMO). At the District's discretion, a copy of the approved SEIR may be circulated to agencies that have an interest in the project. The project then proceeds to the next phase of project development.