Feasibility of Implementing Direct Transit Service Connecting Miami International Airport with PortMiami

Executive Summary

Miami-Dade Transportation Planning Organization

With technical assistance from TRANSYSTEMS

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Miami-Dade Transportation Planning Organization

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1 Findings and Recommendations

The findings and recommendations of the Feasibility of Implementing Direct Transit Service Connecting Miami International Airport (MIA) with PortMiami are summarized below:

1.1 Recommendations

This study evaluates both Metrorail and Automated People Mover alternatives for establishing a direct transit connection between MIA and PortMiami. While both modes are technically feasible, further planning and evaluation is required for the selection of a locally preferred alternative.

The **Metrorail Extension**, shown in Figure 1, is proposed to use the existing Metrorail from MIA to the vicinity of the Historic Overtown/Lyric Theatre Metrorail Station. From there, a new 1.9 mile elevated segment would extent east, either over the Florida East Coast (FEC) railway corridor or along NE 6th Street. The extension would rise above the Metromover at NE 2nd Street, continue elevated over US-1, and then cross the Intracoastal Waterway on a new bridge. From there, the route would proceed along Port Boulevard and terminate at a new elevated Metrorail station within PortMiami.

Metrorail Extension

- 1.5 to 2.1 million estimated annual riders
- $700 to $800 million estimated capital costs
- $12 to $15 million estimated annual operating and maintenance costs

Figure 1: Metrorail Extension Route

1.2 Findings

PortMiami is the World's leading cruise port and the "Cargo Gateway of the Americas." The PortMiami 2050 Master Plan projects cruise ship passengers will increase from 7 million in 2023 to 24 million in 2050.

Miami International Airport (MIA) was ranked as the second busiest airport in the U.S. for international passengers, first for international cargo, and tenth for total aircraft operations[1]. MIA had 52.3 million passengers in 2023 and is anticipated to reach 77 million passengers in 2040[2].

Annual estimated ridership forecasts for a direct transit connection between MIA and PortMiami in 2050 ranges between 1.1 million and 2.1 million.

Providing transit connections between MIA and PortMiami to serve the large cruise passenger market presents both challenges and opportunities.

- **Transfers and Convenience:** Cruise passengers often travel with large amount of luggage and are frequently families with children, making transfers between transit modes particularly challenging.
- **Preference for Direct Service:** Cruise passengers are more likely to opt for direct, door-to-door transportation from the airport to the cruise terminal, even at a higher price, rather than navigating a multi-step transit journey.
- **Trip Timing and Schedule Coordination:** Cruise passengers arrive and depart in large waves, typically concentrated around ship embarkation and disembarkation times. Transit services must align with these schedules to be viable.
- **Seamless Luggage Transfers:** A key opportunity to enhance transit appeal is facilitating easy luggage transfers from MIA to PortMiami. Streamlined luggage handling, similar to airport-to-hotel transfer services, could make transit more attractive by reducing passenger burden.
- **Dedicated or Express Services:** Implementing a direct or express transit service with minimal stops between MIA and PortMiami could improve convenience and competitiveness with private transportation options.
- **Partnerships with Cruise Lines:** Collaborating with cruise operators to integrate transit services into their passenger experience, such as offering bundled transit fares or designated shuttles, could encourage more cruise passengers to use transit.

[1] Miami-Dade Aviation Department, 2024
[2] Ibid.

2 Purpose and Need and Goals and Objectives

2.1 Purpose and Need

The Miami-Dade Transportation Planning Organization (TPO) initiated the study to examine the feasibility of implementing a direct transit service between PortMiami and Miami International Airport (MIA), as there is currently no direct public transportation link between these two locations. Based on the insights gained from previous studies and an updated review of available transit vehicle technologies, the TPO developed two alternatives to provide this direct transit service. These alternatives aim to meet the demand for a safe, convenient, efficient, fast, and reliable connection between these two major transportation hubs in Miami-Dade County, thereby enhancing mobility throughout the greater Miami area. The study assessed whether such a service is an option to further extend and augment the existing Strategic Miami Area Rapid Transit (SMART) Program.

The following needs were identified:

- Existing transportation access options for cruise ship passengers traveling outside the region to/from MIA, within the region's to/from central station/transit hubs such as Government Center or MiamiCentral, and locally to/from Downtown are limited.
- Existing transportation access options for cruise, cargo, and office employees at the Port are limited.
- Vehicular traffic congestion within the Port, on the Port Miami Bridge, and on connecting roadways Downtown occurs because of large cruise ship passenger volumes, which are heavily peaked during certain months, days of the week, and times of day.
- Land for additional parking at the Port for passengers is constrained.
- Future growth in the cruise ship passenger market is anticipated to be significant which will further exacerbate access, congestion, and parking constraints at the Port.
- Existing transit options to/from the Port do not have attractive travel times, and do not take into consideration special cruise ship travel needs such as luggage transport.
- PortMiami is a premiere global cruise destination adjacent to Miami's vibrant Downtown but an attractive and reliable transit connection between these important hubs is lacking.
- Port terminals are widely spaced, creating long walking distances and demand is not balanced between the locations of parking and the cruise terminals.

2.2 Goals and Objectives

Goals and objectives were developed to guide (1) the identification of alternatives for this study and (2) the development of criteria to screen the alternatives.

Goal 1: Create a direct "one seat ride" transit service between PortMiami and MIA.

Objective: Eliminate from consideration transit services that would require a transfer or would not be appropriate for the distance between PortMiami and MIA.

Goal 2: Develop a transit service that is safe, reliable, convenient, and efficient.

Objective: Maximize passenger safety, service frequency and reliability, as well as passenger movement.

Goal 3: Provide a fast and reliable transit service between PortMiami and MIA.

Objective: Minimize travel time and delay between PortMiami and MIA.

3 Existing Services & Plans, Prior & Related Studies, and Best Practices

The existing transit services available in the study area were identified, including Metrorail, Metromover, Metrobus, MetroConnect, Coral Way Trolley, Tri-Rail, and Brightline.

Several existing, prior, and related plans and studies were reviewed for this effort, as shown in Table 1.

Table 1: Existing, Prior, and Related Plans and Studies Reviewed

	Plan or Study Name	Conducted By	Year Completed
Existing	PortMiami 2050 Master Plan	PortMiami	2024
	MIA Master Plan and Capital Improvement Program	Miami-Dade Aviation Department	2008
	Transportation Improvement Program (FY 2025-2029)	TPO	2024
	2045 Long Range Transportation Plan*	TPO	2019
Prior	Transit Options to PortMiami Feasibility Study	TPO	2013
	Metromover System Expansion Study	TPO	2014
Related	Port Everglades to Fort Lauderdale - Hollywood International Airport	Various agencies	Since 2009
	Strategic Miami Rapid Area Transit (SMART) Program	TPO	2016
	Metromover Upgrade Project (DTPW, ongoing)	DTPW	Ongoing
	Brightline Stuart and Cocoa stations and extension to Tampa	Brightline	2024
	Flagler Corridor SMART Demonstration Project	*Construction planned for fall 2025*	
	SHIFT305	DTPW	2023
	Countywide Transportation Master Plan	DTPW	Ongoing
	Better Bus Network	DTPW	2023
	Transit Oriented Communities	DTPW	Ongoing
	Miami Downtown Development Authority Master Plan (DDA)	DDA	2009
	Miami-Dade County Comprehensive Development Master Plan	Miami-Dade County	2023
	City of Miami Comprehensive Neighborhood Plan	City of Miami	2019

**The 2050 Long Range Transportation Plan was being developed while this study was underway.*

Best practices research was also conducted for this study. Other top busiest cruise ports in the world were identified and their transit access evaluated. This research revealed that none of the other top ports have direct transit access, relying instead on buses and shuttles. This is likely because cruise ports are typically

situated in industrial and maritime zones, which are often beyond the reach of the nearest urban transport networks.

Additional worldwide research was performed to identify any ports with direct rail or fixed guideway transit access. Four locations were identified for further research: Vancouver, Boston, San Francisco, and Singapore. Vancouver, Canada, was identified as having direct rail transit between the airport and the port. The other three transit services between an airport and a port identified are not direct and require users to transfer. This information is summarized in Table 2.

Table 2: Peer Review Fixed Route Transit between Port and Airport

City, State, Country	Airport - Cruise Port	Distance	# of Transfers	Travel Time	Cost (One-Way, USD*)
Vancouver, British Columbia, Canada	Vancouver Airport – Vancouver Cruise Port	8.5 miles	None – Direct	30 mins total: 26 mins on SkyTrain + 4 min walk	$6.84 eastbound $3.14 westbound
Boston, MA, US	Boston Logan International Airport – Boston Cruise Port	4.5 miles	1	40 mins total: 30 mins BRT + 10 min walk	$2.40
San Francisco, CA, US	San Francisco International Airport – Port of San Francisco	16 miles	1	60 mins total: 42 mins on transit + 16 mins walk	$13.55
Singapore	Changi Airport – Singapore Cruise Center and Marina Bay Cruise Center	Singapore Cruise Center – 15 miles Marina Bay Cruise Center – 13 miles	2	50-55 mins total: Singapore Cruise Center – 41 mins on transit + 15 mins walk Marina Bay Cruise Center – 38 mins on transit + 12 mins walk	$1.65

**Canadian and Singapore Dollars converted to US Dollars based on Forbes September 4, 2024, conversion rates.*

4 Alternatives Analysis

Building off several previous studies that evaluated a direct connection between PortMiami and MIA, the TPO revisited the potential transit technologies available for this service. The list of transit technologies initially considered included:

- Rail modes:
  - Cable car
  - Commuter rail
  - Heavy rail
  - Light rail (LRT)
  - Automated Guideway Transit (AGT)/Monorail
  - Automated people mover (APM)
  - Streetcar
  - Intercity rail
- Non-rail modes:
  - Aerial tramway
  - Bus rapid transit (BRT)
  - Automated Transit Network (ATN)

Several alignments were also developed, informed by previous planning and engineering studies. These included railroad alignments on the South Florida Rail Corridor, Florida East Coast (FEC) Railway Little River Branch, FEC Mainline, and the Downtown Spur; Metrorail's route between MIA and Downtown Miami; the Dolphin Expressway; and various local road options. Screening criteria were developed based on the goals and objectives for the study. To narrow down the long list of technologies, Goal 1 was used to establish screening criteria for identifying a mode suitable for the 8- to 10-mile route between PortMiami and MIA. As a result of this evaluation, five modes were carried forward: APM, BRT, commuter rail, heavy rail, and LRT.

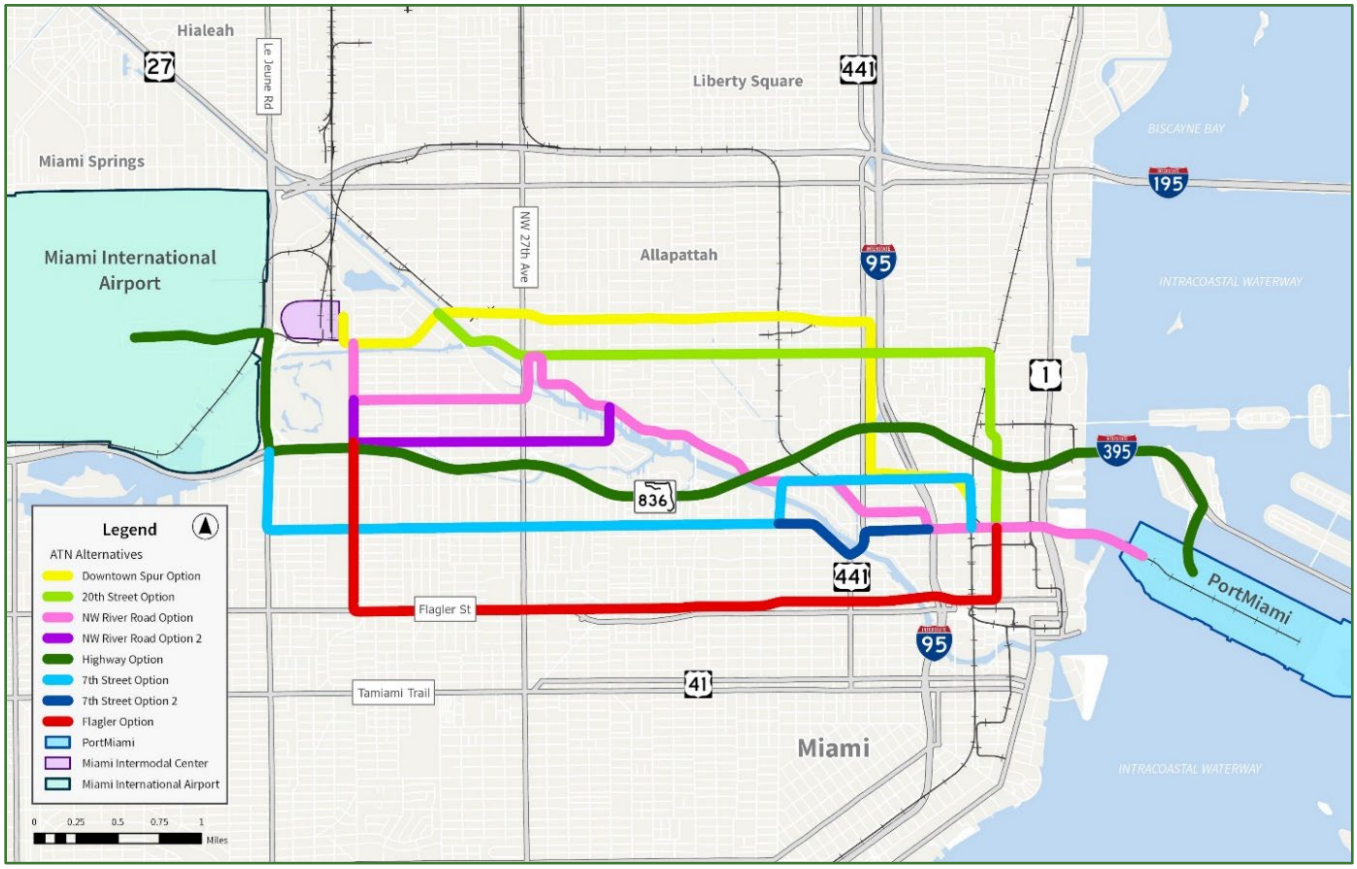
These technologies were then applied to the appropriate alignments to identify five alternatives for the Tier 1 evaluation. A brief description of each of these alternatives is provided below and graphically depicted on the following pages.

Alternative 1 Automated People Mover with Highway, Rail, and Local Road Alignment Options - This alternative proposes an eight- to ten-mile automated people mover using a dedicated alignment on elevated structure. A variety of route options, shown in Figure 2, using roadway or railroad alignments can be considered to reach PortMiami including:


Source: Miami-Dade County Aviation Department, 2024

- Downtown rail spur to NW 7th Avenue
- NW 20th Street to NW 1st Avenue
- NW N River Drive via NW 17th Street/NW 27th Street Bridge or NW 14th Street/NW 22 Street Bridge and NW 11th Street and NW 1st Avenue
- Dolphin Expressway to Port Tunnel
- NW 7th Street to NW 12th Avenue Bridge to NW 11th Street or NW 5th Street Bridge
- West Flagler Street/SW 1st Street (FL-968) to SW 2nd Avenue

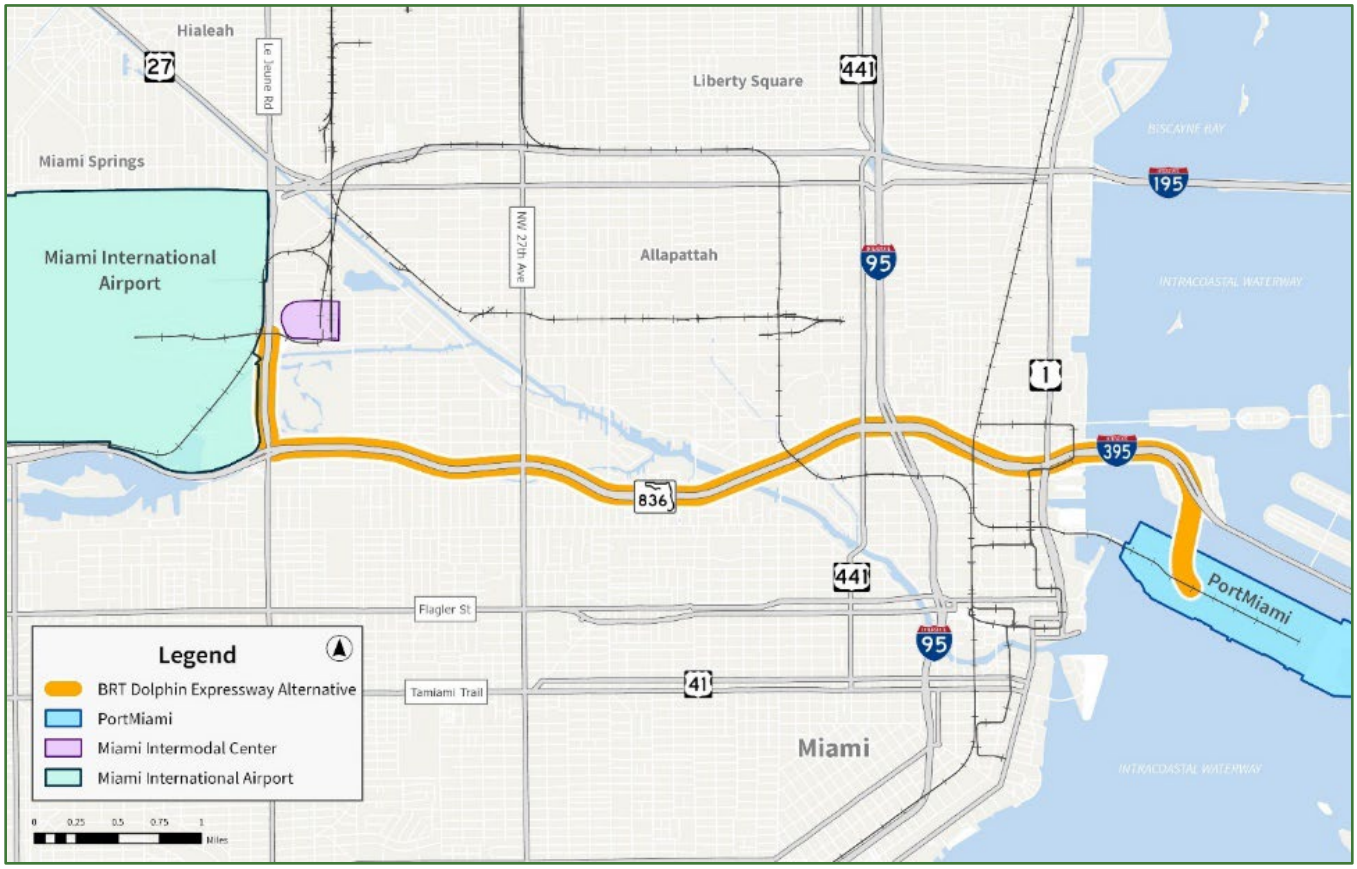
Figure 2: Automated People Mover Highway, Rail, and Local Road Alignment Options



Alternative 2 Bus Rapid Transit Dolphin Expressway - This alternative, shown in Figure 3, proposes an eight-mile BRT service using LeJeune Road/SR953, SR 836/Dolphin Expressway, I-395/MacArthur Causeway, and the PortMiami Tunnel. An alternative route could be considered via Downtown Miami using NE 5th Street to Port Boulevard.

Source: Miami Herald, 2021

Figure 3: Bus Rapid Transit Dolphin Expressway



Alternative 3 Commuter Rail SFRC and FEC Railroads - This alternative, as shown in Figure 4, proposes a 14-mile commuter rail service from the MIC using SFRC/Tri Rail Airport Line track, with a new connection to the FEC Little River Branch (used by Tri Rail service to MiamiCentral Station) just south of E 25th Street by the Metrorail Transfer, then staying on the FEC tracks at-grade to PortMiami using the existing rail bridge and rail track.


Source: South Florida Regional Transportation Authority, 2024

Figure 4: Commuter Rail SFRC and FEC Railroads

Alternative 4 Heavy Rail Metrorail Extension - This alternative proposes a 10-mile Metrorail heavy rail service using a 1.9-mile extension from the Overtown/Lyric Theater Station to PortMiami. As illustrated in Figure 5, the route proposes to utilize the existing Metrorail alignment from the MIA Metrorail Station to the vicinity of the Overtown/Lyric Theater Metrorail Station. An elevated segment would continue through downtown to a new bridge over the Intercoastal Waterway into PortMiami to a future elevated station on the Port site.

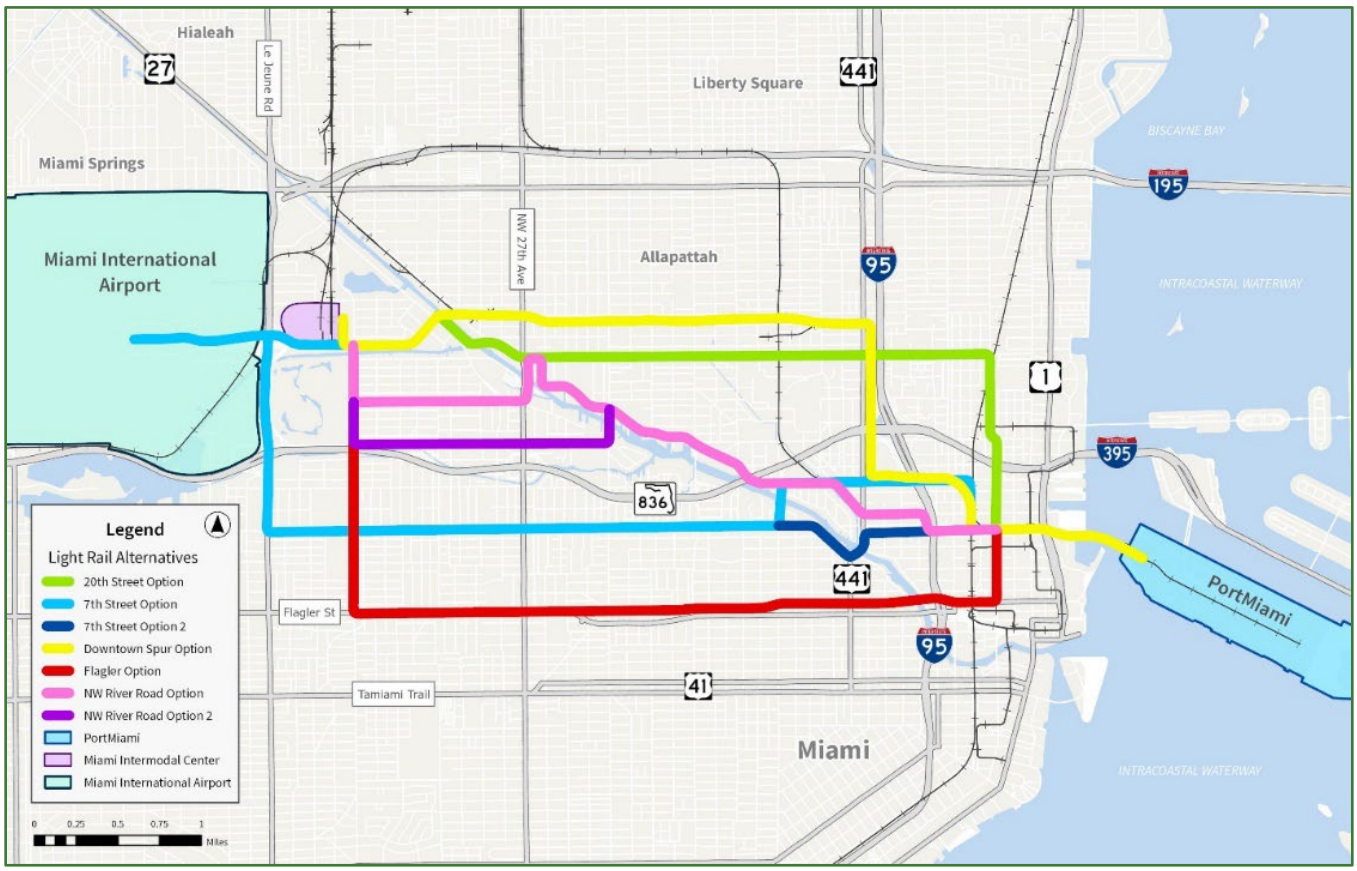

Source: Miami-Dade County, 2024

Figure 5: Heavy Rail Metrorail Extension

Alternative 5 Light Rail with Local Road Alignment Options - This alternative proposes a nine- to ten-mile light rail service operating at-grade within existing roadway or railroad alignments. As illustrated in Figure 6 a variety of route options can be considered to reach NW 5th/NW 6th Street to Port Boulevard including:

- Downtown rail spur to NW 7th Avenue
- NW 20th Street to NW 1st Avenue
- NW N River Drive via NW 17th Street/NW 27th Street Bridge or NW 14th Street/NW 22 Street Bridge and NW 11th Street and NW 1st Avenue
- SR 836/Dolphin Expressway to Port Tunnel
- NW 7th Street to NW 12th Avenue Bridge to NW 11th Street or NW 5th Street Bridge
- West Flagler Street/SW 1st Street (SR 968) to SW 2nd Avenue

Figure 6: Light Rail Various Alignment Options



Goals 2 and 3 were used as screening criteria for the Tier 2 evaluation, which further narrowed the Tier 1 alternatives to two: Automated People Mover (APM) and Metrorail Extension.

The **Automated People Mover** (APM) alternative was further evaluated, and the NW 7th Street option was carried through the remainder of the study as it appeared to provide the most benefits relative to the other options. This alternative is illustrated in Figure 7. The analysis assumed five stations: one or more at PortMiami; Downtown Miami in the vicinity of the Metrorail Overtown/Lyric Theater Station and MiamiCentral; and at the MIC by MIA. Future expansion could include additional stations at Kaseya Center, Loan Depot Park, and Miami Freedom Park, the future home of the InterMiami CF soccer club.

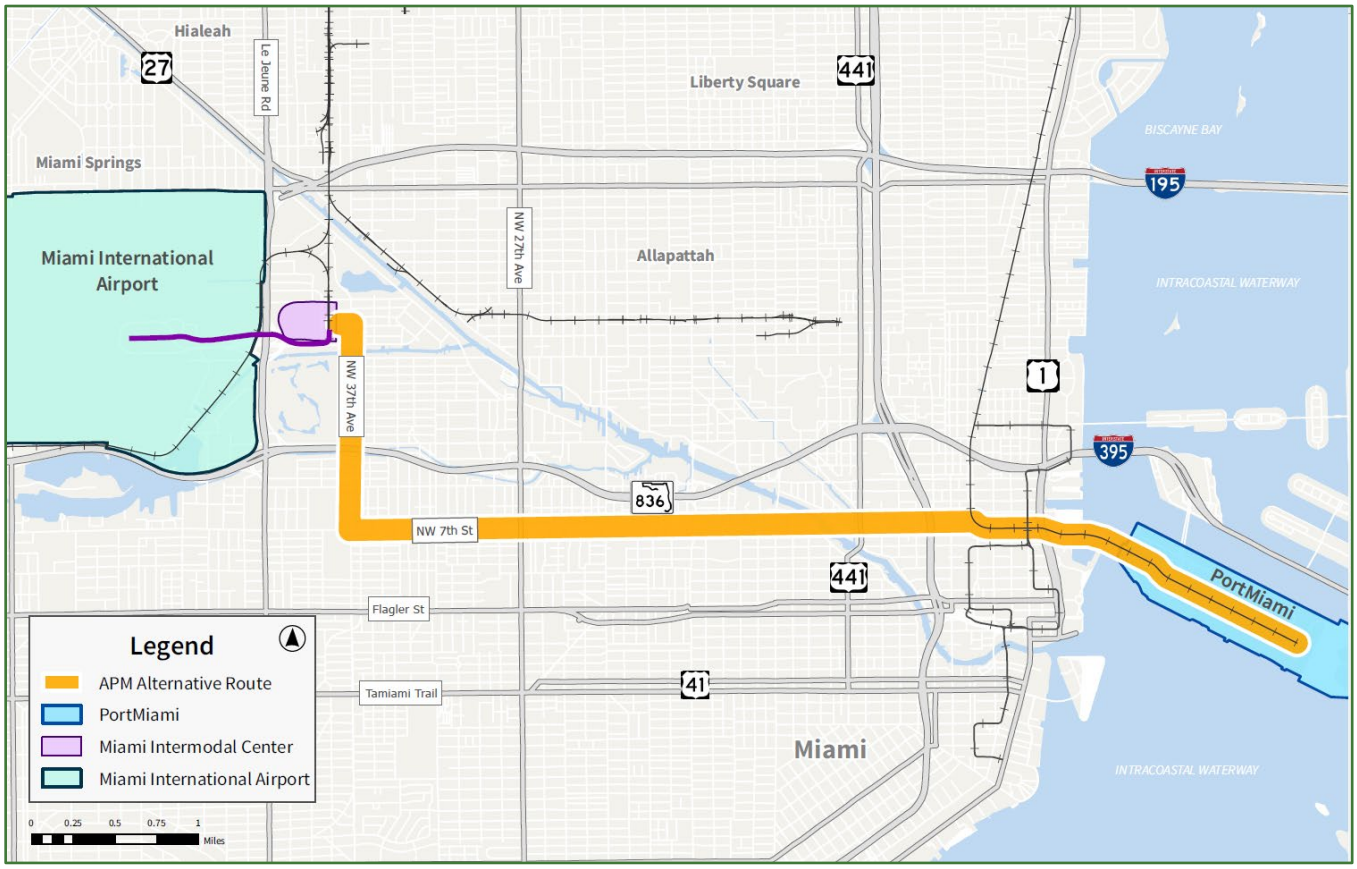
Goal 2 Screening Criteria:

- *High frequencies are possible to meet demand.*
- *Vehicles have the capacity to move cruise ship passenger volumes.*

Goal 3 Screening Criteria:

- *Travel time is competitive with private vehicle travel time.*
- *Dedicated right-of-way will eliminate delay and promote reliability.*

Figure 7: Automated People Mover Alternative Route



The **Metrorail Extension** alternative proposes to utilize the existing Metrorail from MIA to the vicinity of the Historic Overtown/Lyric Theatre Metrorail Station. From there, a new 1.9 mile elevated segment would extend east, either over the Florida East Coast (FEC) railway corridor or along NE 6th Street. The extension would rise above the Metromover at NE 2nd Street, continue elevated over US-1, and then cross the Intracoastal Waterway on a new bridge. See Figure 8.

Figure 8: Metrorail Extension Alternative Route

These Tier 2 alternatives were further developed to identify physical features (guideway, stations, structures, vehicles, power systems, vehicle storage and maintenance, and command centers), operating plans and fleet requirements, ridership, capital and operating and maintenance costs, environmental and community considerations (social, cultural, natural, and physical resources), and governance, risk and phasing considerations.

5 Summary of Recommended Alternatives

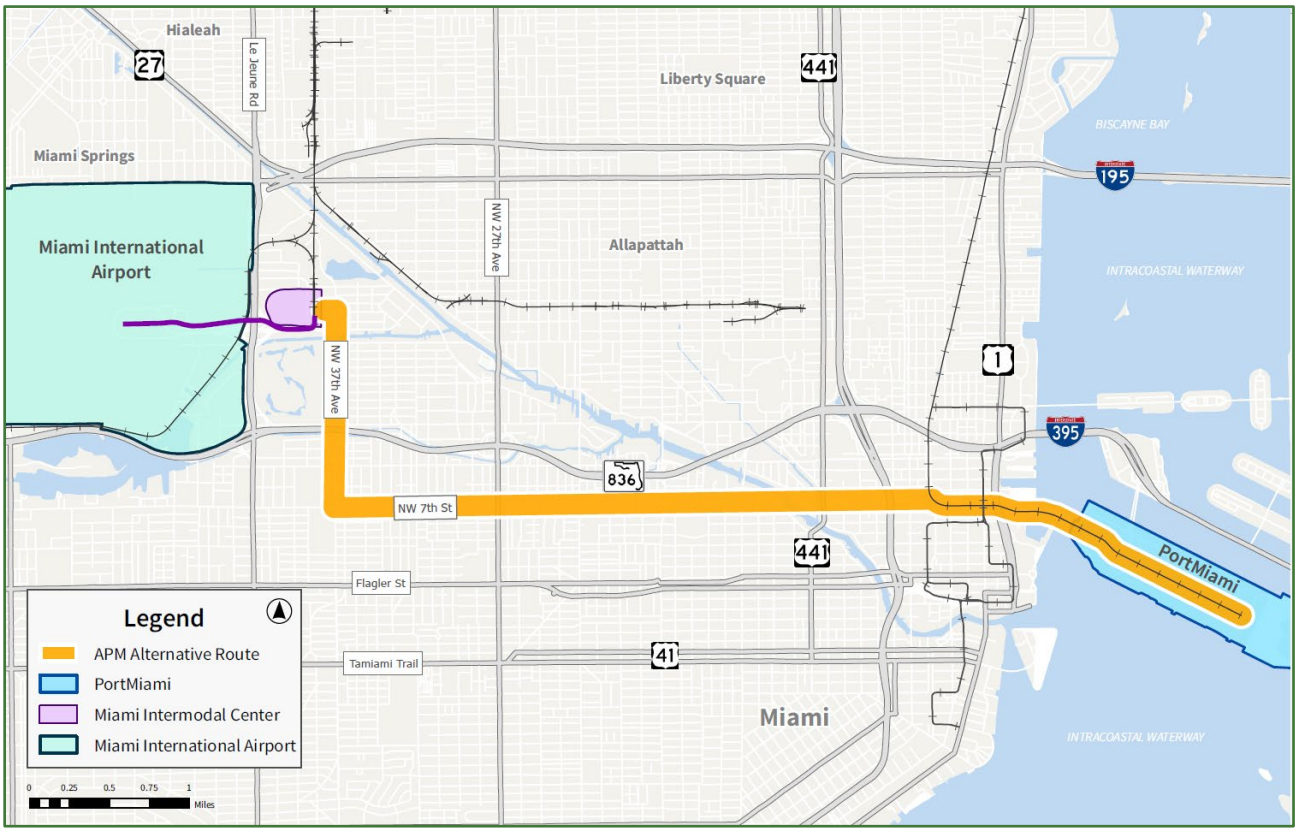
The study identified two potential solutions for a direct transit connection between Miami International Airport and PortMiami: an Automated People Mover (APM) or a Metrorail Extension. Information about each of these alternative solutions is provided below.

The **Automated People Mover** (APM) alternative, a technology similar to Metromover, is illustrated in Figure 9. A summary of key features of this alternative is highlighted above the figure. The analysis assumed five stations: one or more at PortMiami; Downtown Miami in the vicinity of the Metrorail Overtown/Lyric Theater Station and MiamiCentral; and at the MIC by MIA. Future expansion could include additional stations at Kaseya Center, Loan Depot Park, and Miami Freedom Park, the future home of the InterMiami CF soccer club.

Automated People Mover

- 1.6 to 2.3 million estimated annual riders
- $600 to $700 million in estimated capital costs
- $9 to $11 million in estimated annual operating and maintenance costs

Figure 9: Automated People Mover Alternative Route



The **Metrorail Extension**, shown in Figure 10, proposes to utilize the existing Metrorail from MIA to the vicinity of the Historic Overtown/Lyric Theatre Metrorail Station. From there, a new 1.9-mile elevated segment would extend east, either over the Florida East Coast (FEC) railway corridor or along NE 6th Street. The extension would rise above the Metromover at NE 2nd Street, continue elevated over US 1, and then cross the Intracoastal Waterway on a new bridge. From there, the route would proceed along Port Boulevard and terminate at a new elevated Metrorail station within PortMiami.

Metrorail Extension

- 1.5 to 2.1 million estimated annual riders
- $700 to $800 million estimated capital costs
- $12 to $15 million estimated annual operating and maintenance costs

Figure 10: Metrorail Extension Alternative Route

The features of the recommended alternatives are summarized in Table 3.

Table 3: Summary of Alternative Features

	Automated People Mover Alternative	Heavy Rail Metrorail Extension Alternative
Service Distance	9 miles	10 miles
New Infrastructure Length	9 miles	2 miles
New Stations	5 stations (3 additional potential)	2 stations
New Guideway	9 miles, 15-40 feet wide	2 miles, 30-60 feet wide
New Structures	May be able to use existing Port Bridge and/or Miami River bridge	Likely need a new bridge over the Intercoastal Waterway
Vehicles	Rubber tired on paved surface	Steel wheel on rail
Vehicle Passenger Capacity	50 passengers	75 passengers
Vehicle Motive Power	Electric, battery or power rail	Electric third rail
Vehicle Storage & Maintenance	New or expanded facility	Existing facility
Command/Control Center	New or expanded facility	Existing facility
Travel Time	24-34 minutes (depending on routing/stations)	22-27 minutes (depending on time of day)
Estimated Annual Riders	1.6-2.3 million	1.5-2.1 million
Capital Cost*	$600-$700 million	$700-$800 million
Annual O&M Cost	$9-11 million	$12-15 million

**Capital costs do not include right-of-way acquisition, bridges/structures, or environmental mitigation.*

Each of the recommended alternatives has strengths and weaknesses as summarized in Table 4.

Table 4: Summary of Alternative Strengths and Weaknesses

	Automated People Mover Alternative	Heavy Rail Metrorail Extension Alternative
Stations	Small size and scalable footprint	Large size and standard footprint
PortMiami Circulation	Close to cruise terminals, walkable to destination	Central location, other means of circulation required to cruise terminals
Operations	Vehicles operate on fixed schedule	Vehicles operate on a fixed Metrorail schedule
Frequency	Service frequency can be scheduled to match demand	Service frequency can be scheduled to match demand within the parameters of Metrorail schedule
Flexibility	Flexibility to size the fleet capacity to the demand	Technology must conform to the existing Metrorail system with limited flexibility to size for demand
Guideway	Flexibility to permit shared use of the guideway for one or more system technologies initially or in the future	Guideway dedicated only for Metrorail
Vehicle Technology	As technology evolves, vehicles can be replaced/ updated without major guideway or infrastructure modifications	Vehicle replacement requires technology consistency systemwide
Costs	Less per line item but guideway infrastructure is a longer distance	More costs per line item but guideway infrastructure is a shorter distance
Governance	Existing mode, new or existing owner/operator	Existing mode, existing owner/operator
Challenges	Right-of-way availability	Proven system, technology and costs are more predicable
Environment & Community	Nine miles of new alignment with associated potential for impacts	Only two miles of new alignment with associated potential for impacts
Scalability	Technology is scalable, which could have a demonstration service between PortMiami and downtown	Scalability is not applicable

6 Conclusions

This study evaluates both Metrorail and Automated People Mover (APM) alternatives for establishing a direct transit connection between MIA and PortMiami. While both modes are technically feasible, further planning and evaluation is required for the selection of a Locally Preferred Alternative on this corridor. At this time, the project is recommended to be incorporated into the 2050 Long-Range Transportation Plan (LRTP), Priority IV unfunded section, for future advancement and funding opportunities.

In addition to the proposed direct transit connection between MIA and PortMiami, the implementation of an internal circulation service, such as an Automated Transit Network (ATN), could further enhance overall system connectivity and user convenience. ATN systems are electrically powered modes of transit operating in an exclusive guideway, typically over short distances, with fully automated operation. Unlike conventional rail systems, ATNs utilize self-powered electric vehicles with rubber tires that operate on roadway surfaces, offering a flexible, low-emission solution for first- and last-mile connectivity within large facilities such as airports and seaports.

Also, there are possible short-term measures that could be implemented to incrementally improve trip making between PortMiami and MIA using transit. These early action items to improve transit trips could include:

- **Branded PortMiami Shuttles from Miami Central/Overtown Station** – Operate cruise-specific branded shuttles from the existing downtown transit stations to PortMiami. The cost of the shuttle could be included in the cruise reservation fee.
- **Integrated Fares** – Provide a one ticket fare solution that includes the Metrorail fare from MIA to downtown as well as the shuttle bus that is easy for travelers to use instead of having to purchase a ticket for transit.
- **PortMiami Wayfinding** – Develop signage specific to cruise passengers at the MIA terminals, MIA mover, MIC, Overtown Station, and PortMiami terminals that makes it clear for users how to access transit. Signage can use a standard transit symbology and unique colors to be immediately recognizable to travelers, indicating the direction of transit access and the location for each link in the trip between PortMiami and MIA.
- **Take Transit to Cruise Marketing Campaign** – Design a marketing campaign to spread awareness about using of transit to get between PortMiami and MIA. Working with the individual cruise providers at PortMiami, custom marketing efforts can be targeted at specific cruise passenger types.
- **Port Transit Customer Service Ambassadors** – Assign customer service staff to welcome cruise passengers, direct them to transit, assist with fare payments, and answer questions. Ambassadors could be located at MIA terminals, MIA mover, MIC, Overtown Station, and PortMiami terminals during the peak seasons, days, and times for cruise travel.
- **PortMiami-MIA Travel Social Media Pages** – Develop a social media page or presence on platforms such as Facebook, Instagram, and/or TikTok devoted to communicating with customers about traveling between Port Miami and MIA. Travel tips using transit can be shared, and followers can share real time information experiences and recommendations.