

East-West Corridor Rapid Transit Project

Executive Summary Phasing Strategy Final



East-West Corridor Project Development & Environment Study

Executive Summary Phasing Strategy Final

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Acronyms and Abbreviations

APTA	American Public Transportation Association
BERT	Bus Express Rapid Transit
BRT	Bus Rapid Transit
CFA	Core Foraging Area
CRT	Commuter Rail Transit
DTPW	Department of Transportation and Public Works
EIS	Environmental Impact Statement
FDOT	Florida Department of Transportation
FIU	Florida International University
FLUCFCS	Florida Land Use Cover and Forms Classification System
FMSF	Florida Master Site File
FTA	Federal Transit Administration
FWC	Florida Wildlife Conservation
GIS	Geographic Information Systems
HRT	Heavy Rail Transit
LPA	Locally Preferred Alternative
LRT	Light Rail Transit
L RTP	Long Range Transportation Plan
MIC	Miami Intermodal Center
MPO	Metropolitan Planning Organization
NTD	National Transit Database
PAC	Project Advisory Committee
PD&E	Project Development and Environment
ROD	Record of Decision
ROW	Right-of-Way
SHPO	State Historic Preservation Officer
SERPM	Southeast Regional Planning Model
SFRTA	South Florida Regional Transportation Authority
SFWMD	South Florida Water Management District
SMART	Strategic Miami Area Rapid Transit
STOPS	Simplified Trips on Project
TAZ	Traffic Analysis Zone
TDP	Transit Development Plan
TOD	Transit Oriented Development
TPO	Transportation Planning Organization
TSM	Transportation System Management
USFWS	United States Fish and Wildlife Service

1. Introduction

In 2016, the SR-836/Dolphin Expressway Corridor (East-West Corridor) was identified in the Strategic Miami Area Rapid Transit (SMART) Plan for the implementation of rapid transit service. In 2017, the Miami-Dade County Department of Transportation and Public Works (DTPW) initiated a Project Development and Environment (PD&E) Rapid Transit Study for the East-West Corridor. The primary focus of the study is to identify a rapid transit running-way primarily along the SR 836 corridor, including an examination of other roadways such as NW 7th Street, NW 12th Street and the CSX Railroad. The Study is being prepared in collaboration with the Florida Department of Transportation (FDOT), the Miami-Dade Transportation Planning Organization (TPO), and the Miami-Dade Expressway Authority (MDX).

The Miami-Dade TPO Governing Board adopted the SMART Plan in April 2016, formally setting the plan into action. FDOT has initiated PD&E Studies on three of the corridors identified in the SMART Plan:

- Flagler Street Corridor Bus Express Rapid Transit (BERT);
- Kendall Drive Premium Transit; and
- NW 27th Avenue Rapid Transit Corridor.

DTPW initiated the PD&E Studies for three (3) Rapid Transit Corridors, the East-West, South, and Beach. These corridors are presented in Figure 1. The East-West Corridor Rapid Transit PD&E Study will focus on providing multimodal street improvements and rapid transit service but will also include other roadways and expressways connecting to East-West Corridor for accommodating potential branched transit routes that will be part of the proposed rapid transit service. Public involvement efforts have been conducted within the context of each individual corridor and are also coordinated with the overall multi-corridor SMART Plan.

DTPW's Transit Development Plan (TDP) notes that the County will evaluate potential funding sources for capital costs, including Federal New or Small Starts grants to fund the SMART Plan. The SMART Plan's Rapid Transit Corridors and corresponding Bus Express Rapid Transit (BERT) Network are depicted Figure 1. The East-West Corridor is in Miami-Dade County, Florida and traverses the cities of Sweetwater, Doral, and Miami, as shown in Figure 2. The corridor spans from east to west and is located between the Miami Intermodal Center (MIC) to the east and the proposed Tamiami Station to the west and, for reference, is adjacent to these other important roadway corridors:

- SW 157th Avenue to the west;
- NW 7th Street to the south;
- NW 12th Street to the north; and
- SR 953/NW 42nd Avenue/LeJeune Road to the east.

To address the mobility needs in the entire East-West Corridor, the study limits were expanded to also include the West Extension Study Area between the Tamiami Terminal and the Dolphin Terminal along US 41/SR 90/SW 8th Street/Tamiami Trail, SW 137th Avenue and the SR 836 Extension. East of LeJeune Road, this documentation also highlights the impacts of transit infrastructure improvements to connect to Downtown Miami.

The East-West Corridor Rapid Transit PD&E Study will identify and evaluate several "Build" alternative modes and alignments within various types of right-of-way, as well as the potential termini for a new rapid transit service. It is expected that the East-West Corridor Rapid Transit PD&E Study will lead to local decisions for a preferred investment in operational and capital transit improvements within the corridor.

Figure 1: The Smart Plan Corridors

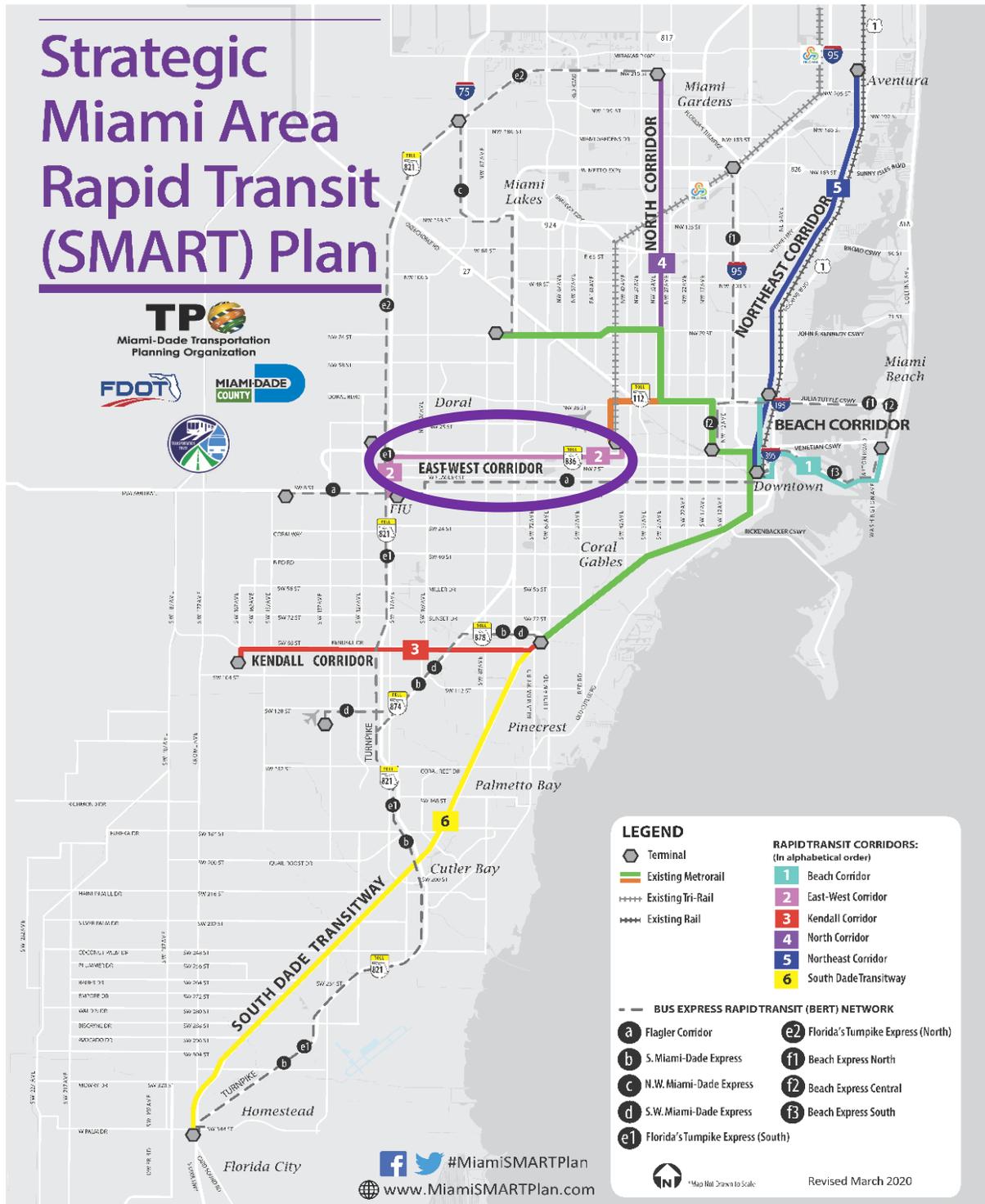
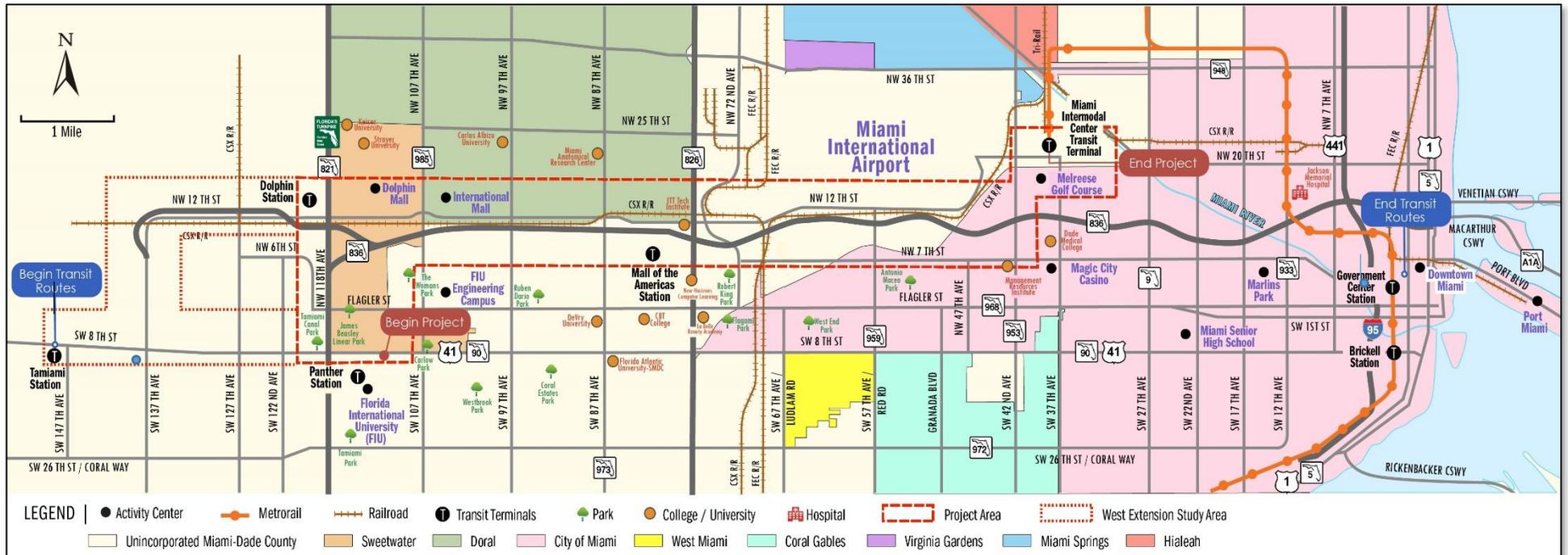


Figure 2: Corridor Study Area



1.1 Project Purpose and Need Statement Framework

The following goals have been developed for the East-West Corridor Rapid Transit PD&E study:

- Provide more frequent and reliable transit service;
- Provide transit connectivity between the majority activity centers;
- Provide alternative travel mode and option to personal car;
- Promote multi-modalism, and support local economic development; and
- Maximize the use of existing transit system and facilities in the corridor.

These goals have been used to develop specific objectives and evaluation measures to screen the various alternatives studied. The goals mentioned above are consistent with the overall goals of the Federal Transit Administration's (FTA) Project Justification and Rating Criteria for the New Starts and Small Starts program.

The East-West Corridor is the only major east-west connector in the County, providing limited connections to the major activity centers in the region. The need is to improve connectivity and provide alternate options for local and regional travel. Transportation issues in the Corridor include:

- Lack of rapid transit connectivity to major activity centers to the west. The existing Metrorail Orange Line service currently stops at the Miami Intermodal Center via the Airport Link. Connection to the Airport requires transfer from the Metrorail (Heavy Rail Transit) to the Airport PeopleMover. Transit connection west of the Airport to major activity centers such as Florida International University, Dolphin Mall, International Mall, and Mall of the Americas is mainly provided via Metrobus Route 338, Route 7, Route 8, Route 11, and Route 51. Route 338 is the only route running along SR 836/East-West, connecting the Airport to Dolphin Mall. The route is a limited-stop route, weekend service only running at 60-minute headway. Better weekday service is needed to service the major activity centers in the corridor.
- Heavy congestion projected to increase. As the single high capacity expressway link connecting the western and eastern sections of Miami-Dade County, SR 836 will carry close to 300,000 vehicles per day based on estimated 2040 traffic volumes, providing access to 260,000 jobs. The facility currently experiences high levels of congestion that are expected to increase as a result of continued growth in population, employment and visitors. Rapid transit service in the corridor would make the corridor less auto dependent and minimize the rate at which congestion occurs. The existing passenger car/driving time from Dolphin/FIU/Tamiami to Downtown is 60 minutes.
- Limited regional transit connectivity. Metrorail, AMTRAK, and Tri-Rail are all regional transit lines with a connection at the MIC. A rapid transit connection from the MIC to points west would provide regional connectivity to areas served by Metrorail, as well as to Broward County and beyond.
- Hurricane/emergency travel time. Because of its strategic location, SR 836 plays a crucial role in providing mobility in an emergency event, such as a hurricane, that would require safe and orderly evacuation. It is the longest east-west freeway in Miami-Dade County for use by residents leaving life-threatening storm impact areas and going to local public shelters,

hotels/motels, the homes of friends and relatives in "dry" areas, and to the airport. A rapid transit service would improve evacuation travel times and provide additional transportation mode.

- Lack of rapid transit service to transit-dependent population. A rapid transit service within the East-West Corridor would provide mobility to more than 10 percent of the total transit dependent population in Miami-Dade County. More than 50,000 of the residents within the corridor are 65-years and older and an equal number are students who attend Florida International University at the western terminus of the proposed rapid transit service.
- Lack of rapid transit service to support economic growth. Construction of a rapid transit service in the East-West Corridor is estimated to create 22,300 jobs in construction, producing nearly \$1.5 billion in yearly labor income and will serve the 1.3M people in Miami-Dade's labor force. A rapid transit service within the Corridor will stimulate the economy through private sector investment in potential public-private partnerships.

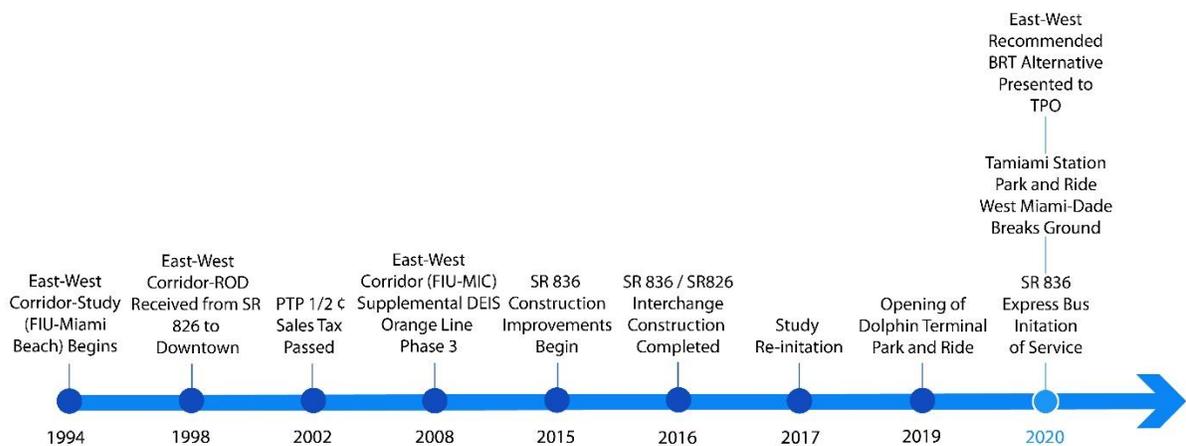
1.2 Plan Consistency

The SR 836/East-West Corridor project is listed as a funded project in the Miami-Dade FY 2020-2024 Transportation Improvement Program (TIP) approved in June 2019. The TIP identifies funding for the PD&E/EMO Study phase.

1.3 Project History

The project has a history dating back to the early 1990s. Over the years, various studies have been performed and are summarized in Figure 3. The figure also notes significant advances in new transit infrastructure that is being leveraged to provide this new premium transit service.

Figure 3: Project History and Evolution



2 Recommended Alternative

Section 8.0 of the report provides detailed analysis of each of the criteria evaluated for all of the Refined Alternatives as well as summary matrix leading to the identification of the BRT Alternative being the recommended alternative.

The report documents the refinements to the alternatives presented at the April 2020 Miami-Dade TPO Governing Board meeting and provides a Recommended Alternative for consideration as a Locally Preferred Alternative for the East-West Corridor. The refinements to the alternatives presented at the April 2020 Miami-Dade TPO Governing Board meeting addressed the requests made by the Board members to:

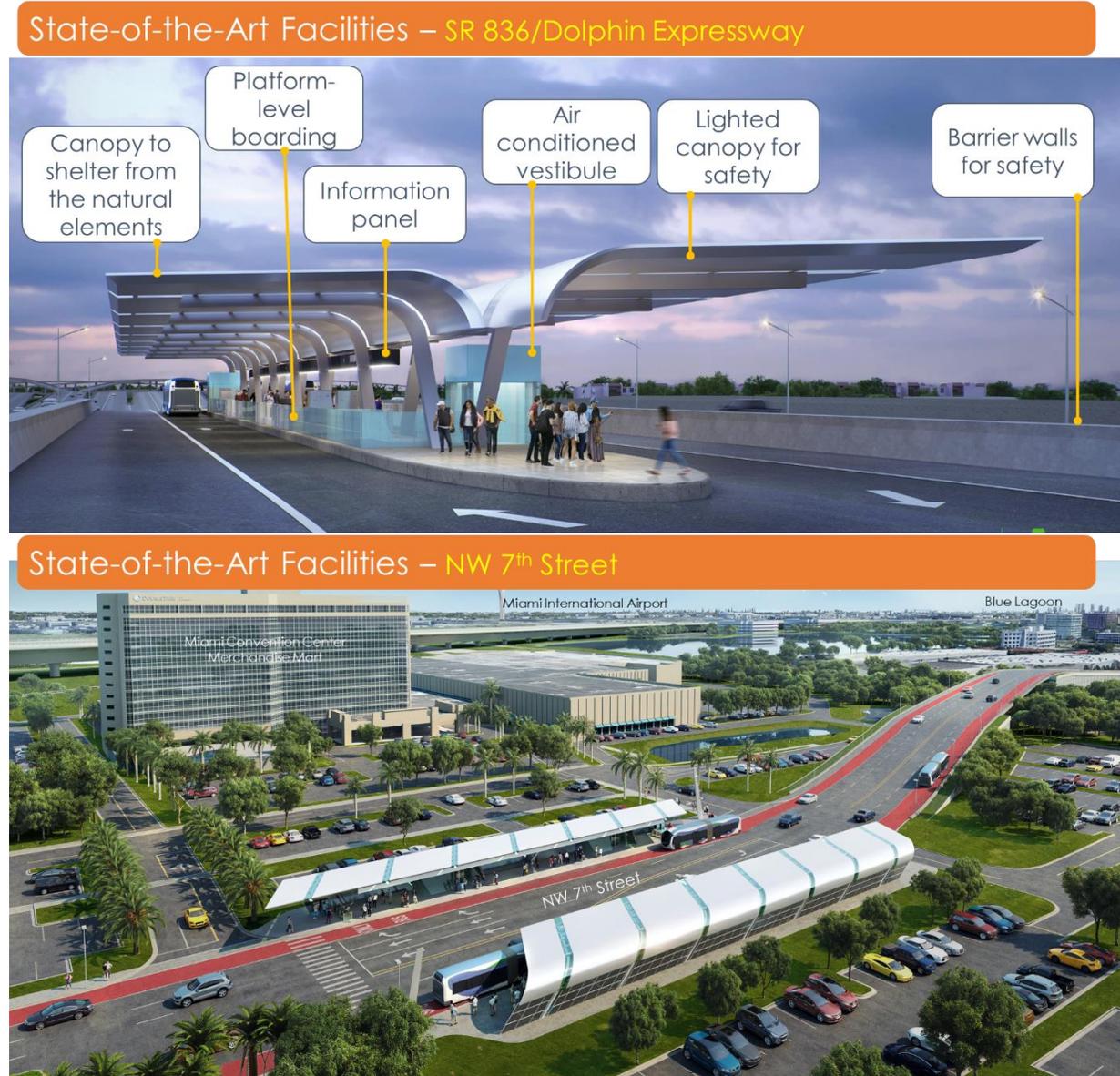
- Provide dedicated lanes only for BRT operation
- Accommodate state-of-the-art stations
- Provide connections to the west
- Identify funding strategy

The refinements were applied to BRT, HRT, and CRT alternatives presented at the April Miami-Dade TPO Governing Board Meeting. The report describes the refinement process, provides an overview of the findings, and puts forward a Recommended Alternative and Phasing Strategy for selection of the LPA. The refined alternatives were each evaluated based on cost, mobility, and environmental effects criteria and resulted in the BRT Alternative identified as the recommended alternative.

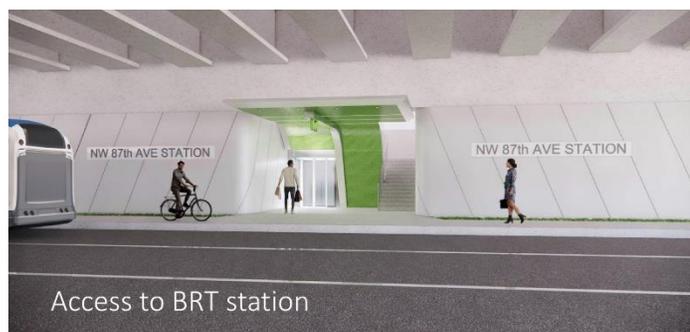
In order to leverage federal dollars and expedite the implementation of premium transit in the East-West Corridor, the Recommended BRT Alternative was phased into two projects under \$300M. Projects with capital costs under \$300M are eligible for Small Starts funding under the Federal Transit Administration (FTA) Capital Improvement Grant (CIG) Program.

State-of-the art and iconic stations will be an integral part of the Recommended BRT Alternative as illustrated in Figure 4.

Figure 4: Iconic Stations



Along SR 836, the stations would be accommodated in the center of the expressway with quick access to pedestrians and local transit routes and trolleys on 107th Avenue, 97th Avenue, and 87th Avenue.



The elements of the Recommended BRT Alternative are illustrated and summarized below:

- Phase 1** - two BRT routes on dedicated lanes connecting the Tamiami Terminal to the MIC and Downtown Miami via the Dolphin Terminal. These routes would be in addition to the 836 Express Routes already planned in the Corridor. The estimated capital cost of this phase is approximately \$265M with an estimated 7,900 riders per day and medium-high Small Starts cost effectiveness.
- Phase 2** – a third BRT route would be added to the two routes in Phase 1 and the 836 Express Routes, connecting the Dolphin Terminal to the MIC via the Blue Lagoon area. The capital cost for this phase is estimated at \$153M, would generate an additional 2,675 riders per day and yields a medium cost effectiveness ratio for Small Starts funding opportunity.

The funding strategy identified at the Miami-Dade TPO Fiscal Priority Committee (FPC) July 2020 Meeting assumed a 33 percent share each from federal, state, and local funds, based on capital cost of \$300M or less for Phase 1.



3 Alternatives Considered

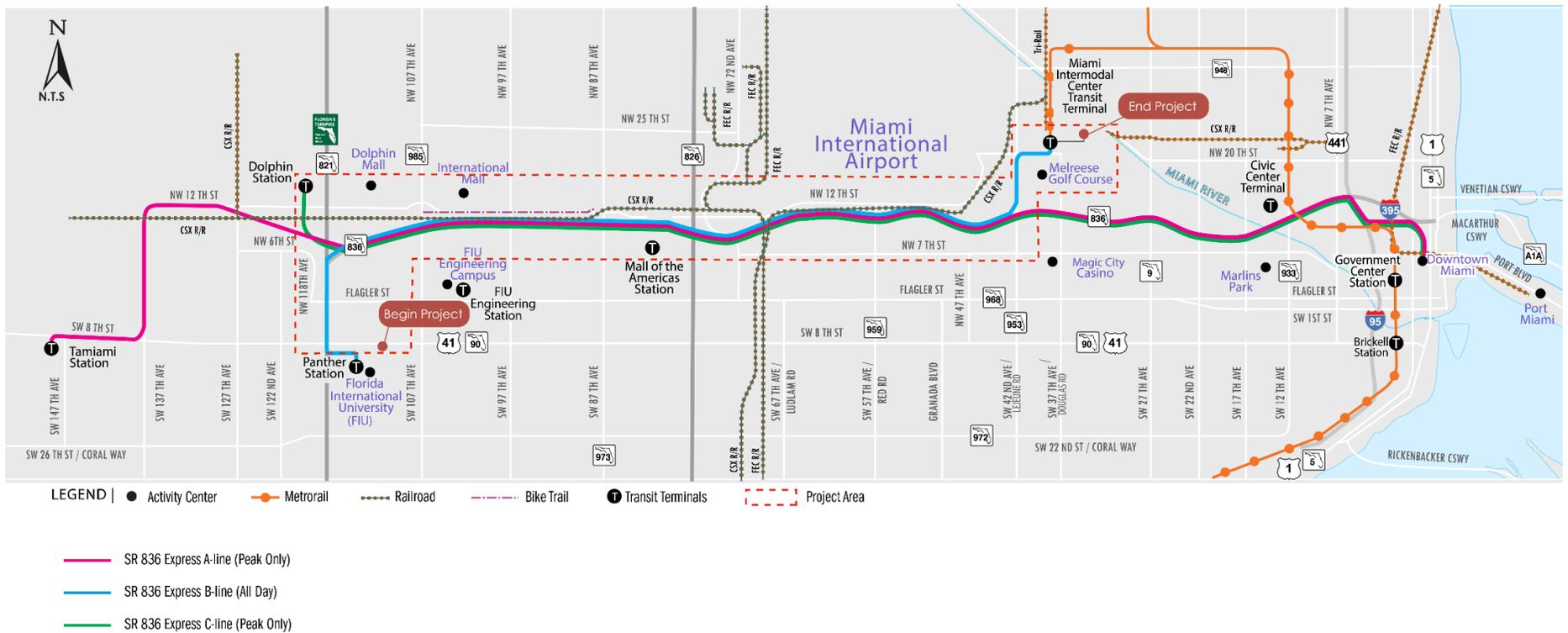
The East-West Rapid Transit Project proposed a No-Build and four Build Alternatives that were presented at the April 2020 TPO Governing Board Meeting. The Build Alternatives were further refined based on comments received at the April 2020 Miami-Dade TPO meeting. The description and analysis of the refined alternatives are presented in this section. The refined Build Alternatives expand on the previous alternatives, adding or modifying elements to address the concerns raised at the April 2020 TPO meeting, enhance transit service and improve mobility within the Corridor. The refinements include linking the western section of Miami-Dade County and the surrounding areas of the proposed Tamiami and Dolphin Terminals. The alternatives will provide transit options to the City of Doral, the City of Sweetwater, the City of Miami, the Miami Intermodal Center (MIC) at the Miami International Airport, the Blue Lagoon area, and Downtown Miami.

The following is a brief description of the four alternatives including proposed transit modes, alignments, and service plans. The refinement of the April 2020 analysis led to consolidation of alternatives in this report to the No-Build Alternative, the Bus Rapid Transit Alternative 2 – Refined, five alternatives include the No-Build Alternative, the Heavy Rail Transit Alternative 3 – Refined, and Commuter Rail Transit Alternative 4 – Refined.

3.1 No-Build Alternative - SR 836 Express

The No-Build Alternative remains the same as the one presented at the April 2020 TPO Board Meeting. This alternative consists of three proposed commuter express bus routes that provide point-to-point service between the Tamiami, Dolphin, and Panther transit stations and the MIA/MIC or Downtown Miami via SR 836/Dolphin Expressway (Figure 5), running on the inside shoulders along SR 836. As a point-to-point service, these routes would not have intermediate stops between the start and end of line.

Figure 5: Transit Service – No-Build Alternative - SR 836 Express



Proposed transit services to be operated in the No-Build Alternative include the following:

- **SR 836 Express A-Line** would operate between Tamiami Terminal located at the southwest corner of SW 8th Street and SW 147th Avenue and Downtown Miami via SR 836/Dolphin Expressway. Service would operate at 10-minute headways and be provided during weekday AM and PM peak periods only. The AM peak for this service is for three hours from 6 AM to 9 AM. The PM peak for this service is for three hours from 4 pm to 7 pm. (Peak hour source: STOPS model.)
- **SR 836 Express B-Line** would operate between the Panther Station located on the Florida International University (FIU) Modesto Maidique Campus and the MIA/MIC via SR 836/Dolphin Expressway. Service would operate on weekdays all day with 20-minute headways during the AM, midday and PM peak periods. The AM peak for this service is for three hours from 6 AM to 9 AM. The PM peak for this service is for three hours from 4 pm to 7 pm. (Peak hour source: STOPS model.)
- **SR 836 Express C-Line** would operate between Dolphin Terminal on NW 12th Street near the SR 836/ Dolphin Expressway and Florida Turnpike – Homestead Extension junction and Downtown Miami. Service would operate on 10-minute headways during weekday AM and PM peak periods only. The AM peak for this service is for three hours from 6 AM to 9 AM. The PM peak for this service is for three hours from 4 pm to 7 pm. (Peak hour source: STOPS model.)

3.2 Refined Build Alternatives Alignment and Service

The proposed Build Alternatives identified within the East-West Rapid Transit Corridor include Bus Rapid Transit (BRT), Heavy Rail Transit (HRT, Metrorail), and Commuter Rail Transit (CRT). A detailed description of the refinements to the alternatives presented at the April 2020 TPO Board and the service plans is provided in the following sections. The refined alternatives are illustrated in Figure 6.

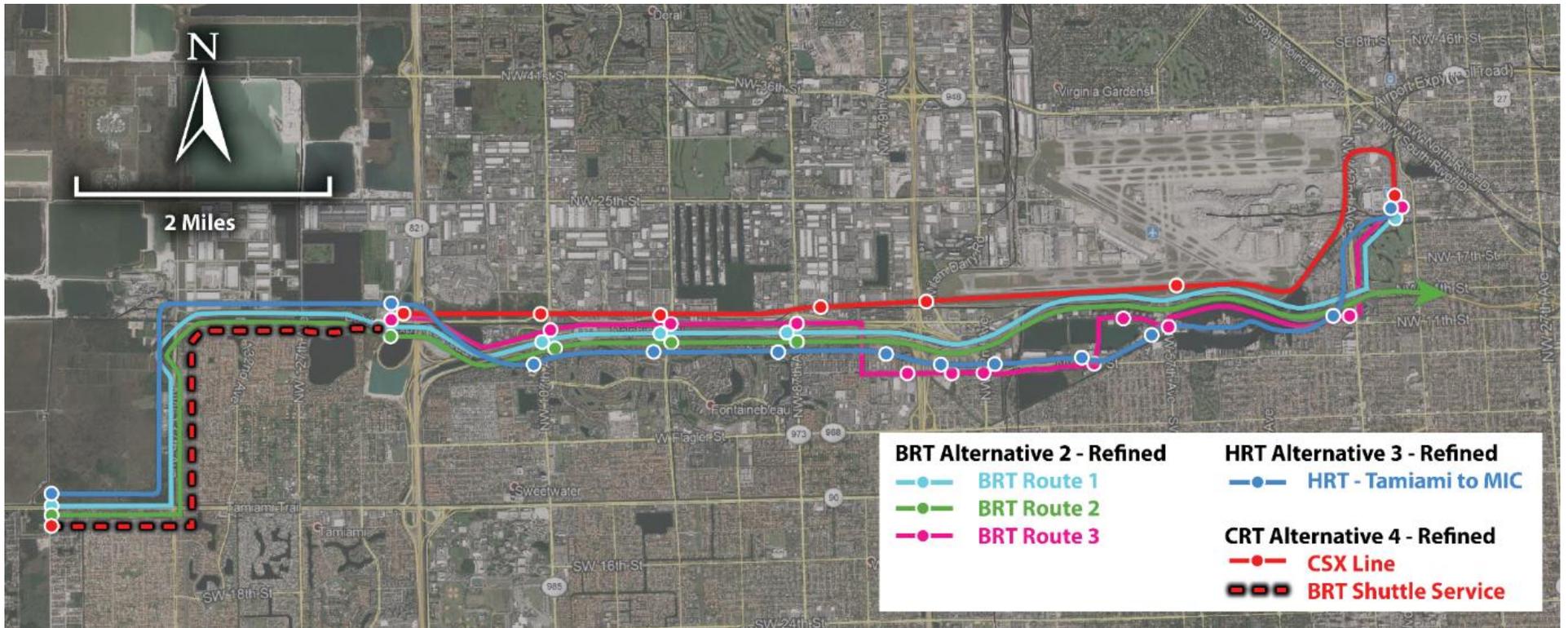
3.2.1 Bus Rapid Transit (BRT) Alternative 2 - Refined

Refinements to Alternative 2 presented at the April 2020 TPO meeting include the following in addition to the three commuter express routes in the No-Build Alternative:

- Provide three BRT Routes to operate from the Tamiami Terminal at SW 147th Avenue and SW 8th Street to MIC/MIA and Downtown Miami via Dolphin Terminal, SR 836/Dolphin Expressway and Blue Lagoon Drive.
- Moving the western terminus from Florida International University Panther Station to the Tamiami Terminal at SW 147th Avenue and SW 8th Street.
- Provide for exclusive BRT lanes running on dedicated center reversible transit only lane along SW 8th Street and SW 137th Avenue, in the center of SR 836, and on dedicated lanes on NW 7th Street

- State-of-the-art center stations on SR 836 at 107th, 97th, and 87th Avenue and along NW 7th Street with all amenities associated with BRT facilities.
- Connect to the Dolphin Terminal via the direct ramps to and from SR 836 Extension proposed by Miami Dade Expressway Authority.

Figure 6: Build Alternatives Refinements



Proposed transit services to be operated in the BRT Refined Alternative 2 include the following:

- **BRT Route 1** would operate between the proposed Tamiami Terminal and the MIA/MIC via the Dolphin Terminal and three additional BRT stations at NW 107th Avenue, NW 97th Avenue, and NW 87th Avenue along the SR836/Dolphin Expressway. Service would operate on weekdays from 5AM to 12AM (midnight) with 15-minute headways at all times. On Saturdays, service would be provided from 6AM to 12AM (midnight) with 15-minute headways at all times. On Sundays, service would be provided from 8AM to 10PM, with 30-minute headways at all times.
- **BRT Route 2** would operate between the proposed Tamiami Terminal and the Government Center Metrorail Station in Downtown Miami via the Dolphin Terminal and three additional BRT stations at NW 107th Avenue, NW 97th Avenue, and NW 87th Avenue along the SR836/Dolphin Expressway. Service would operate on weekdays from 5AM to 12AM (midnight) with 15-minute headways at all times. On Saturdays, service would be provided from 6AM to 12AM (midnight) with 15-minute headways at all times. On Sundays, service would be provided from 8AM to 10PM, with 30-minute headways at all times.
- **BRT Route 3** would operate between the proposed Dolphin Terminal and the MIA/MIC via the Mall of the Americas and nine additional BRT stations at NW 107th Avenue, NW 97th Avenue, NW 87th Avenue along the SR 836/Dolphin Expressway, the Wedge, NW 72nd Avenue, NW 62nd Avenue, NW 60th Avenue, NW 57th Avenue, and LeJeune Road located in the residential and commercial Flagami neighborhood just south of the SR 836/Dolphin Expressway. Service would operate on weekdays from 5AM to 12AM (midnight) with 15-minute headways at all times. On Saturdays, service would be provided from 6AM to 12AM (midnight) with 15-minute headways at all times. On Sundays, service would be provided from 8AM to 10PM, with 30-minute headways at all times.

BRT Route 1 and Route 2 are both proposed to operate along the same alignment between Tamiami Terminal and the NW 87th Avenue BRT Station. With this, the composite headway between the Tamiami Terminal and NW 87th Avenue would be 7.5 minutes during operation in the AM and PM peak periods.

All three BRT routes would operate along the same alignment between Dolphin Terminal and the NW 87th Avenue BRT station. With this, the composite headway between the Dolphin Terminal and NW 87th Avenue would be five minutes during operation in the AM and PM peak periods.

The refined Alternative 2 was further evaluated based on the following two phases: Phase 1 to include Routes 1 and 2 and Phase 2 to include Route 3 in addition to Phase 1.

3.2.2 Heavy Rail Transit (HRT) Alternative 3 - Refined

Refinements to the HRT Alternative 3 presented at the April 2020 TPO Board meeting consist of starting the HRT line at the Tamiami Terminal instead of at the FIU Panther Station. The line would run elevated along WW 8th Street, SW 137th Avenue, and along the north side of the SR 836 Extension to the Dolphin Terminal. East of the Dolphin Terminal, the line would follow the same alignment as in Alternative 3 presented at the April 2020 TPO Board meeting running along the

south side of SR 836/Dolphin Expressway to the MIC/MIA Station. This alternative will provide a one-seat ride from the Tamiami and Dolphin Terminals to Dadeland South via Downtown Miami. The alternative also includes the commuter express bus routes assumed in the No-Build Alternative.

With the westward extension of the existing Orange Line from the MIA/MIC Station, an additional 11 stations would be constructed between the proposed Tamiami Terminal and the existing MIA/MIC Station. The stations are placed to serve and provide connection with north-south transit routes and in proximity to major activity centers. Station location will be optimized once the LPA is selected.

Service would be provided daily (Monday through Sunday) from 5AM to 12AM (midnight) with 9-minute headways during the AM and PM peak and 15-minute headways all other times.

3.2.3 Commuter Rail Transit (CRT) Alternative 4 - Refined

The Commuter Rail Transit (CRT) Alternative 4 presented at the April 2020 Board meeting was refined to provide a BRT connection to Tamiami Terminal. The BRT shuttle would begin at the Tamiami Terminal, run in the dedicated center reversible transit only lane on SW 8th Street and SW 137th Avenue. From NW 137th Avenue, the route would access SR 836 Extension, running in the center of the expressway. Direct access to and from SR 836 Express to the Dolphin Terminal would be provided via the ramps proposed to be constructed by MDX. Walk access would be provided from the Dolphin Terminal to the existing CSX Line at the CRT Station to be located on the south side of NW 12th Street, across from the Dolphin Terminal.

The BRT shuttle is proposed to operate on weekdays and Saturdays from 5AM to 12AM (midnight) at 10-minute headways during the AM and PM peak and 15-minute headways evenings and weekends. On Sundays, service would be provided from 5AM to 12AM (midnight) at 15-minute headways at all times.

East of the Dolphin CRT Station, the refined alternative is identical to the one presented at the April 2020 TPO Board meeting. The alternative consists of a new passenger commuter rail service that would operate on the existing CSX Railroad tracks currently used for freight service. An additional track (double track) would be constructed as part of the alternative and the existing tracks improved to accommodate Federal Railway Administration (FRA) compliant passenger commuter rail cars. Freight service would continue to operate on the line.

Six commuter rail stations would be constructed west of the existing MIA/MIC Station with the Dolphin Station, across from the Dolphin Terminal, serving as the final terminal station on the commuter rail line. Service would be provided on weekdays and Saturdays from 5AM to 12AM (midnight) at 10-minute headways during the AM and PM peak and 15-minute headways evenings and weekends. On Sundays, service would be provided from 5AM to 12AM (midnight) at 15-minute headways at all times.

3.3 Refined Build Alternatives – Stations

Each of the alternative include stations located at critical locations to maximize access and ridership. Table 1 summarizes the station locations proposed under each of the refined alternative, including the total number of stations under each one.

Table 1: Station Locations

Stations	BRT Refined Alternative 2	HRT Refined Alternative 3	CRT Refined Alternative 4
Tamiami Terminal	1	1	1
Dolphin Terminal	1	1	1
107 th Avenue	1	1	1
97 th Avenue	1	1	1
87 th Avenue	1	1	1
Mall of the Americas	1	1	0
72 nd Avenue @ 12 th Street	0	0	1
7 th Street @ Milam Dairy	1	1	0
The Wedge ¹	0	1	0
7 th Street @ 62 nd Avenue	0	1	0
57 th Avenue @ 12 th Street	1	0	1
LeJeune Road/NW 42 nd Avenue	1	1	0
MIA/MIC	1	1	1
Total Number of Stations	10	11	8

¹ Southeast corner of SR 826/Palmetto Expressway and NW 7th Street

4 Corridor Characteristics

This section discusses the major roadway facilities within the study Corridor and provides information regarding the roadway characteristics such as facility type, median treatment, posted speed limit, and number of lanes.

4.1 Major Expressways

SR 836/Dolphin Expressway, SR 826/Palmetto Expressway and the Homestead Extension of Florida's Turnpike (HEFT) are the major highways passing through the Corridor. SR 836/Dolphin Expressway is the primary east-west connection and will carry close to 300,000 vehicles per day based on

estimated 2040 traffic volumes. SR 836 west of SR 826/Palmetto Expressway provides access to the HEFT and continues further west to SR 825/NW 137th Avenue. SR 826/Palmetto Expressway carries over 260,000 vehicles per day and the HEFT carries close to 121,000 vehicles per day. During peak periods, all three major highways operate over capacity and experience significant delays.

4.2 Major Arterials

SW 8th Street is classified as an urban principal arterial and serves as a restrictive highway due to the presence of median. The facility runs east-west and provides access to SR 836 Extension via SW 137th Avenue and has an interchange with the Turnpike east of SW 122nd Avenue. The annual average daily traffic (AADT) volumes along SW 8th Street ranges from 50,000 to 57,000 vehicles per day between SW 147th Avenue and SW 107th Avenue. DTPW recently broke ground on the construction of the Tamiami Terminal located in the southwest corner of SW 147th Avenue and SW 8th Street. FDOT has plans to widen SW 8th Street west of SW 137th Avenue from a six-lane divided to an eight-lane divided facility through FDOT Project FM #439918-1. This project was let in July 2020 and is a federally funded safety project. FDOT has requested coordination with D6 Safety Office in order to confirm the proposed changes to the intersection of SW 8th St. and SW 137th Ave. will meet the federal safety requirements.

SW 137th Avenue is a six-lane divided minor urban arterial running north-south and connecting SW 8th Street to the SR 836 Extension. The annual average daily traffic on SW 137th Avenue is approximately 48,000 vehicles per day. The interchange with SR 836 Extension allows for north-south to east-west movements. The Snapper Creek Canal (C2) runs along the east side of SW 137th Avenue.

SR 836 Extension is an east-west four-lane limited access tolled facility, extending SR 836/Dolphin Expressway to the west and connect to SW 137th Avenue. The facility is classified as urban principal arterial-freeway expressway. The Extension runs north of and parallel to NW 12th Street. The annual average daily traffic on SR 836 Extension is approximately 18,000 vehicles per day.

NW 12th Street is an east-west arterial that runs north of and parallel to SR 836/Dolphin Expressway along the entire length of the Corridor. The annual average daily traffic (AADT) volumes along NW 12th Street range from 25,000 to 34,000 vehicles per day west of Palmetto Expressway. NW 12th Street continues as Perimeter Road east of NW 72nd Avenue/Milam Dairy Road.

NW 7th Street east of NW 87th Avenue also runs parallel to SR 836/East-West Expressway and serves as one of the key roadway facilities, providing access to several activity centers including the Mall of Americas, retail outlets, wholesale outlet, home improvement retail chain, elementary school and multi-family housing west of SR 826/Palmetto Expressway. The AADT volumes on NW 7th Street range from 20,000 to 28,000 vehicles per day east of SR 826/Palmetto Expressway. West of SR 826/Palmetto Expressway, the daily traffic volume on NW 7th Street is close to 13,000 vehicles per day. NW 7th street is not continuous and does not provide a connection under SR 826/Palmetto Expressway.

NW 107th Avenue, NW 87th Avenue, NW 72nd Avenue, NW 57th Avenue and NW 42nd Avenue are the major north-south arterials that provide access to the Corridor via interchanges with SR 836/Dolphin Expressway. The AADT volumes along these arterials in the vicinity of SR 836 are greater than 40,000 vehicles per day. NW 97th Avenue intersects with NW 12th Street and NW 7th Street but does not have an interchange with SR 836.

4.3 Roadway Link Data

Figure 7 and Figure 8 illustrate the roadway functional classification and the number of lanes of all major roadway within the Corridor study area. The roadway link geometry and characteristics within the study area are described in the *Existing Conditions Traffic and Transit Operations Analysis Memorandum*. The information on the various roadways within the Corridor includes the facility type, the number of lanes, posted speed limits and the type of median. Data on roadway characteristics were obtained from field observations and from FDOT's Straight Line Diagrams (SLD).

4.4 Railroad Facilities

There are two railway lines traversing the study area, which include CSX and the Florida East Coast (FEC) railroad. There are a total of ten (10) railroad crossings within the study area as identified in Figure 9. The CSX runs parallel on the northside of SR 836 between Miami International Airport and the Dolphin Terminal. At-grade crossings are located on:

- NW 42nd Avenue (beyond the project limits)
- NW 57th Avenue
- NW 72nd Avenue
- NW 78th Avenue
- NW 82nd Avenue
- NW 84th Avenue
- NW 87th Avenue
- NW 12th Street (east of NW 72nd Avenue and west of NW 87th Avenue)
- NW 107th Avenue, and
- NW 111th Avenue

There are no railroad crossings for the FEC within the study area. South of NW 12th Street, service on the FEC line has been discontinued and transformed into the Ludlam Trail

Figure 7: Roadway Functional Classification

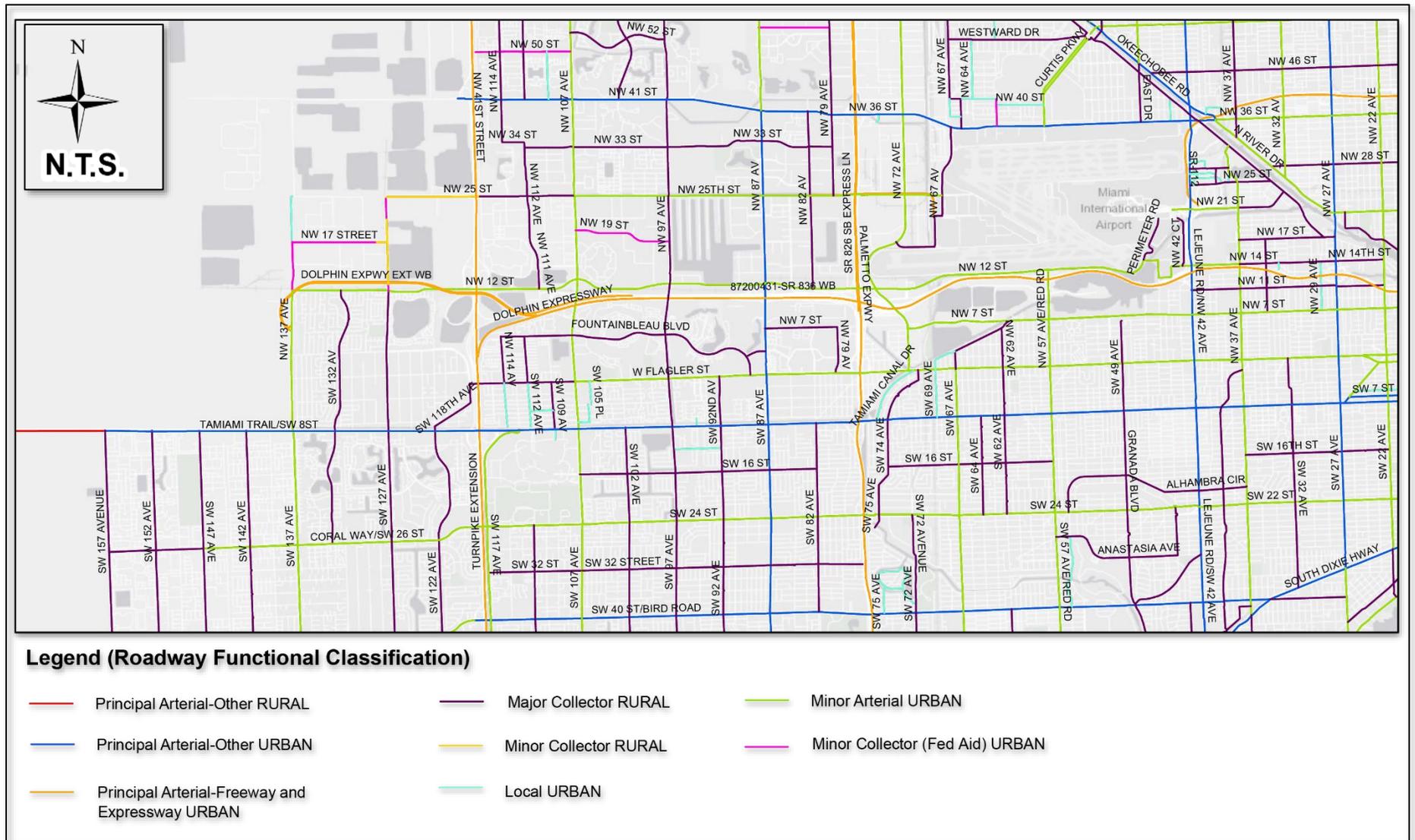


Figure 9: Railroad Crossing Locations



5 Corridor Analysis

In planning studies, a corridor is described as a broad geographical band that follows a general directional flow and connects major sources of trips. A multimodal corridor may contain various parallel and cross streets, highways, transit lines, and routes. The SR 836/Dolphin Expressway is identified as the East-West Rapid Transit Corridor in the Miami-Dade County SMART Plan and established as the only feasible corridor considered for this project. The East-West Corridor is approximately two miles wide, one mile north and south of the major roadways included in the study, namely SR 836 and SR 821/Florida's Turnpike.

6 Alternatives Analysis

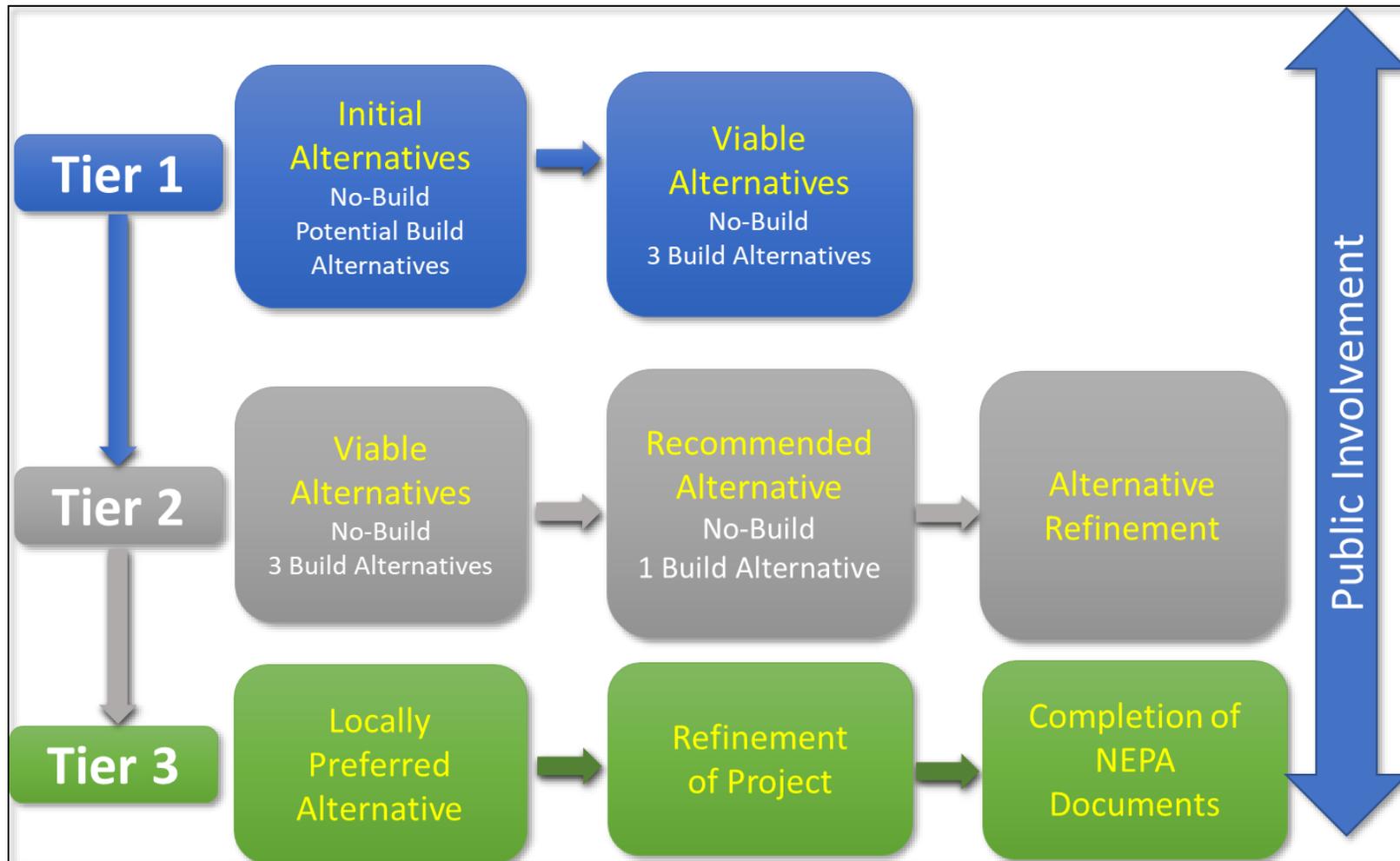
The screening of the various alternatives evaluated was conducted in a tier-based sequence. A first phase, or initial screening, consists of evaluating a wide range of alternatives on a qualitative, quantitative and fatal flaw basis. In this initial phase, several alternatives and modes along the corridor which include all alternatives identified in the study Scope of Services will be evaluated. This initial screening results in a defined set of alternatives to be further evaluated in Tier 2 screening process.

The No-Build Alternative was used as a basis of comparison to evaluate the proposed benefits and impacts of the proposed improvements. The No-Build consists of all the cost feasible projects including highways, and multimodal options included in the County's 2040 Long-Range Transportation Plan (LRTP).

Tier 1 screening process alternatives evaluation results in the identification of viable Build Alternatives to be carried into Tier 2 screening process for further analysis. In Tier 2, a comparative evaluation of the Build Alternatives and the No-Build Alternative against a more detailed set of performance measures is performed. The Tier 2 screening analysis results in the identification of a Recommended Build Alternative based on detailed analysis and input from stakeholders. The Recommended Alternative is further refined, evaluated and used for completion of the required documents based on the National Environmental Protection act (NEPA) as the Locally Preferred Alternative (LPA). The overall process is illustrated in Figure 10.

Recognizing the importance of the East-West Corridor, opportunities for regional connectivity using the existing Dolphin Terminal and proposed Tamiami Terminal as strategic transfer hubs were identified. To that end, the alternatives described above were evaluated to provide connections to the southwestern areas of the County, to the existing Dolphin Terminal and the Tamiami Terminal, and to Downtown Miami.

Figure 10: Alternatives Screening Process



7 Engineering Analysis

Conceptual plans and typical sections have been developed for each of the refined build alternatives. For planning purposes and to facilitate the Tier 2 evaluation, these concept plans were used to assess project impacts based upon the footprint of each of the proposed alignments and station locations. These plans also informed the planning level cost estimates, and further assisted with the assessment of social, natural and physical environment impacts.

The proposed refined build alternative conceptual plans were completed in accordance with FDOT Design Criteria. When developing alignment and station stop concepts, the plans referenced Miami-Dade County's Compendium of Transit Design Criteria.

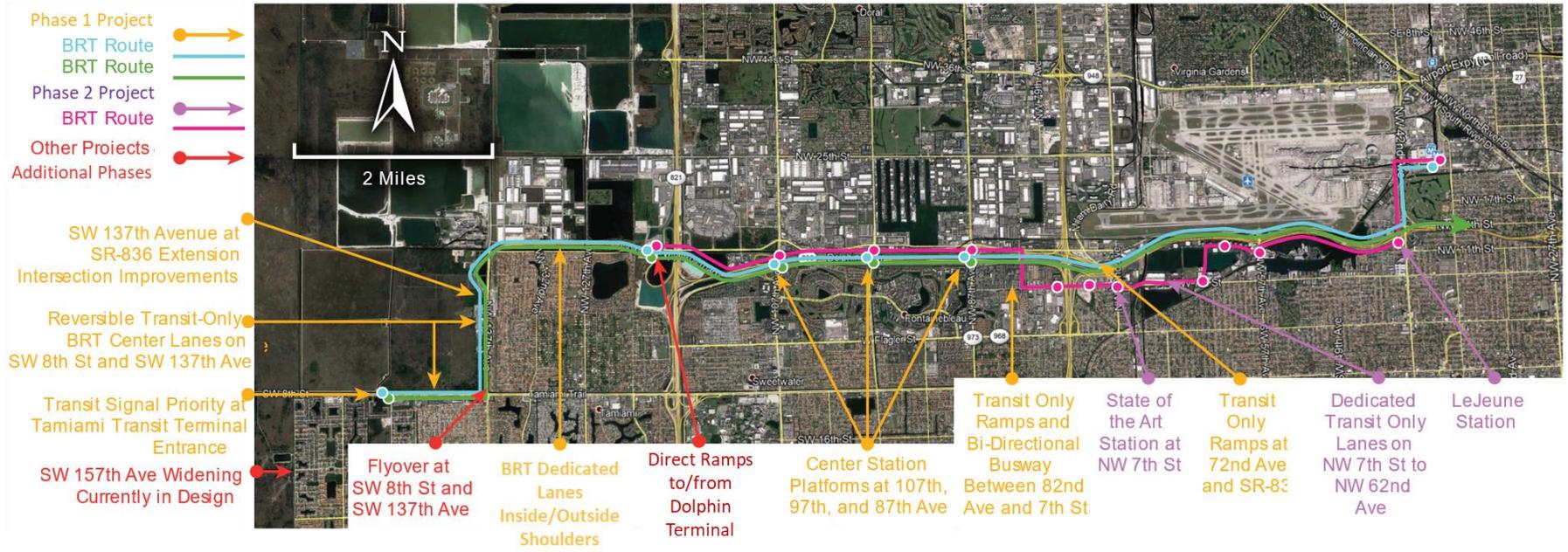
The refined conceptual roll plots/exhibits were shared with public stakeholders and agencies at every opportunity during the public involvement process. This was done to further inform the stakeholders and gain their inputs on elements of the alternatives that impacts their facilities. Upon selection of the recommended alternative as the LPA, the plans for that alternative will be further developed based upon additional detailed analysis and public input.

The Recommended BRT Refined Alternative 2 will be implemented in two phases. Figure 11 Recommended BRT Refined Alternative 2 Elements identified the various engineering elements included in each phase. The BRT will be running on dedicated lanes as follows:

- SW 8th Street – proposed reversible dedicated transit only center lane from Tamiami Terminal to SW 137th Avenue
- SW 137th Avenue - proposed reversible dedicated transit only center lane from SW 8th Street to SR 836 Extension Ramps
- SR 836 Extension – inside/outside shoulder running
- SR 836 – dedicated center lanes with center stations at 207th, 97th and 87th Avenue
- NW 7th Street – dedicated BRT lane in each direction from Mall of the Americas to NW 52nd Avenue, in addition to existing lanes

The typical sections for each of the refined alternatives is provided as a support document to this package.

Figure 11: Recommended BRT Refined Alternative 2 Elements



7.1 Traffic Operations Analysis

Traffic operation analyses were performed for existing traffic conditions as well as future conditions with each of the Build Alternatives presented at the April 2020 TPO Governing Board Meeting, as well as the SR 836 Express Alternative 1 or No-Build Alternative. The traffic impacts east of the Dolphin Terminal are expected to be generally the same for the HRT Refined Alternative 3 and CRT Refined Alternative 4 as the alignments and stations remain the same. The Recommended BRT Refined Alternative 2 significantly improves traffic operation east of the Dolphin Terminal from the one presented in April 2020. By running in the center of SR 836 instead on the outside shoulders, the Recommended BRT Alternative eliminates friction with vehicles entering and existing SR 836 at 107th, 97th, and 87th Avenue. Traffic impact is also minimized along the arterials by providing transit only lanes on SW 8th Street and SW 137th Avenue and adding dedicated BRT lanes on NW 7th Street.

Once the TPO Governing Board selects the Locally Preferred Alternative for the Corridor, additional traffic analysis will be conducted based on the selected mode and alignment.

8 Refined Alternative Analysis Summary

A summary matrix was developed to document the results of the analysis of the three refined alternatives evaluated. The refined alternatives were analyzed using cost, mobility, and environmental effects criteria. Below is a description of each of the parameters and elements used for analysis:

- Cost - This parameter includes estimated construction capital costs, operating and maintenance costs, and cost effectiveness (based on FTA Criteria)
- Mobility - This parameter includes mode shift, estimated ridership, and estimated travel times
- Environmental Effects – This parameter includes identification of potential noise impacts, potential number of parks affected and contamination/hazardous waste site Impacts

A description and source of each of the evaluation criteria is provided in the up-coming sections.

8.1 Project Cost

A summary of the estimated Construction/Capital Cost, Operations and Maintenance Cost, and Cost-Effective Rating (New Starts) for each of the refined alternatives evaluated is provided in Table 2. The data provided in the table is based on range assuming plus/minus 10 percent of the calculated values. The analysis shows that the BRT refined alternative yields the lowest overall cost and falls within the medium-low cost effectiveness threshold established by FTA as part of their Capital Investment Grants (CIG) Program.

Table 2: Refined Alternative Cost Criteria Summary

Evaluation Parameters	BRT Refined Alternative 2	HRT Refined Alternative 3	CRT Refined Alternative 4
	Route 1 - Tamiami Terminal to MIC	Tamiami Terminal to MIC (no transfer to Dadeland South Station)	BRT Shuttle - Tamiami Terminal to Dolphin Station CRT - Dolphin Station to the MIC
	Route 2 - Tamiami Terminal to Downtown		
	Route 3 - Dolphin Station to MIC		
Cost Criteria			
Construction / Capital Cost (including Right-of-Way Cost)	\$418.4 M	\$2,346.7 M	\$1,046.4 M
Operations and Maintenance (O&M) Cost	\$20.9M to \$25.6M	\$39.9M to \$48.7M	\$27.0M to \$33.0M
Cost Effectiveness (New Starts)	Medium - Low	Low	Low
Time of Implementation (construction period only)	2 to 3 Years	6 to 8 Years	4 to 5 Years

8.1.1 Capital Costs

The preliminary capital cost estimates are based on the elements included in each of the refined alternative such as park-and-ride facility cost, roadway construction cost, transit station cost and cost associated with transit vehicles. Park-and-ride facility construction cost estimates were based on local bid prices per square foot, excluding right-of-way. The roadway cost estimates were based on the draft conceptual plans developed for each of the refined alternatives analyzed as part of the refined alternatives evaluation. The unit costs were based on the Florida Department of Transportation Long Range Estimates (LRE) and Basis of Estimates Average Unit Cost for year 2019-2020 Miami Dade County (Area 13). Capital costs for transit vehicles were estimated based on current DTPW transit bids for compressed natural gas buses for BRT, recent procurement costs for Metrorail vehicles, and data from South Florida Regional Transit Agency (SFRTA) for Commuter Rail vehicles. Service assumptions were based on DTPW's National Transit Database (NTD) for 2018 report. Capital cost estimates (range of plus/minus 10 percent from the estimated cost) summarized in Table 2 will be further refined as the project advances into future phases of development.

8.1.2 Right-of-way Impacts

Right-of-way impacts were identified where transit stations are located and/or where additional land is required to accommodate the proposed improvements. A list of properties impacted by each refined alternative alignment was provided to DTPW for cost estimation. The number of acres for each refined alternative is estimated as follows:

- BRT Refined Alternative 2 – (includes Route 1, Route 2, and Route 3): 6 acres
- HRT Refined Alternative 3 – 66 acres
- CRT Refined Alternative 4 - 46 acres

Right-of-way for Park-and-Ride Stations is included in the number of acres for each refined alternative listed above.

8.1.3 Operations and Maintenance Costs

The annual operating and maintenance (O&M) cost estimates for the refined alternatives were based on Miami-Dade DTPW's most recently available O&M cost data as reported to the FTA National Transit Database. Unit cost rates are calculated by dividing the line item expense by the value of the supply variable. These supply variables correspond to the number of revenue vehicle hours and miles of service and the number of vehicles operated in maximum service operated during the subject year. The estimated O&M costs are summarized Table 2.

8.1.4 Cost Effectiveness

Flowing FTA Guidelines, cost effectiveness ratios were calculated for each of the refined alternatives. FTA uses this parameter as only one of the criteria for rating funding recommendations. A summary of the Cost Effectiveness rating is provided in Table 2.

8.1.5 Estimated Construction Time

Construction impacts vary by alternative. The BRT Refined Alternative 2 is estimated to have the shortest construction time, 2 to 3 years, as this alternative only requires improvements to existing outside shoulders on SR 836, repurpose of one travel lane in each direction on NW 7th Street, signal upgrades at the interchanges ramp termini, and construction of the proposed stations.

In addition to the station construction, the HRT Refined Alternative 3 is estimated to take the longest, 6 to 8 years, as it includes construction of elevated guideways, requiring construction of numerous bridges, with some over the SR 836 and the Florida's Turnpike. Timeframe for the CRT Refined Alternative 4 is estimated at 4 to 5 years, accounting for the time required to double-track the existing CSX railroad line.

8.2 Mobility

One of the goals of implementing premium transit in the East-West Corridor is to provide transportation and mobility options to the traveling public and to the 110,200 people living and the 102,200 working in the area. The following sections provide a summary of each of the three criteria used to evaluate the mobility of the refined alternatives: mode shift, ridership, and travel time. The results are summarized in Table 3.

Table 3: Refined Alternative Mobility Criteria Summary

Evaluation Parameters	BRT Refined Alternative 2	HRT Refined Alternative 3	CRT Refined Alternative 4
	Route 1 - Tamiami Terminal to MIC	Tamiami Terminal to MIC (no transfer to Dadeland South Station)	BRT Shuttle - Tamiami Terminal to Dolphin Station CRT - Dolphin Station to the MIC
	Route 2 - Tamiami Terminal to Downtown		
	Route 3 - Dolphin Station to MIC		
Mobility Criteria			
Mode Shift from Auto to Transit (Daily Vehicle Mile Travel Reduction from No-Build)	25.2K to 30.8K	53.1K to 64.9K	15.9K to 19.5K
Route Level Ridership 2040 Route-level Daily Ridership (STOPS Model)	9,610 to 10,680	19,520 to 23,860	6,630 to 7,290
Travel Time - Tamiami Station to MIC (minutes)	24	25	28

8.2.1 Mode Shift

Mode shift was estimated based on the ability of a refined alternative to reduce the number of auto trips with the implementation of transit service in the Corridor. This measure is evaluated countywide in order to account for transfers to and from other modes to the proposed transit service in the Corridor. The analysis shows that the BRT refined alternative results in the lowest amount of auto transit trips in the region, hence in a higher number of travelers switch from auto to transit mode. Accordingly, the BRT refined alternative is estimated to have the highest capacity for mode shift to transit of all the refined alternatives.

Reductions in vehicle miles travelled (VMT) are linked to reductions in greenhouse gas emissions, lessening negative impacts to air quality. A reduction in VMT also indicates lesser reliance on personal cars which in turns improves mobility with more travelers choosing to use transit as their mode of transportation.

8.2.2 Ridership/Trips on Project

The travel patterns associated with East-West Corridor were identified using a combination of datasets and models in the region. Travel demand modeling was performed using the Simplified Trips on Project Software (STOPS) model to evaluate ridership as required by FTA for New Starts/Small Starts application. The range of ridership is based on the average 2020 and 2040 estimate, plus/minus 10 percent.

Based on this measure, the HRT Refined Alternative 3 attracts the highest number of transit riders based on trips on projects at 19,520 to 23,860 per day. The next highest number of riders is estimated to be the BRT Refined Alternative 2 at 9,610 to 10,680 riders per day. The CRT Refined Alternative 4 is estimated to generate the lowest number of riders per day at 6,630 to 7,290. The high ridership with the HRT Refined Alternative 3 can be explained by the fact that in addition to a one-seat ride to Downtown Miami similar to the BRT Refined Alternative 2, the HRT provides a seamless connection from Tamiami Terminal, Dolphin Terminal, the MIC to Dadeland South,

capturing a much wider market than the other alternatives. The CRT Refined Alternative has the most at-grade crossing and therefore more opportunity for delay of the options studied, and requires a transfer to Tamiami Terminal and Downtown Miami, with corresponding lower ridership.

8.2.3 Transit Travel Times

Each of the refined alternatives evaluated would improve the transit travel speeds when compared to current conditions, as they provide for exclusive travel lanes and guideways for the modes evaluated. For comparison purposes, travel times were evaluated for each of the refined alternatives from the Tamiami to the MIC as they all provide service between these two points. These travel times were also compared to using the car during peak periods. The estimated travel time is based on the results of the travel demand forecast from the SERPM model and based on the transit operating plans as presented in the alternatives descriptions. The BRT Refined Alternative 2 shows the lowest travel time of 24 minutes from Tamiami Terminal to the MIC. This is followed by the HRT Refined Alternative 3 at 25 minutes. The CRT Refined Alternative 4 shows the highest estimated travel time at 28 minutes from Tamiami to the MIC.

8.3 Environmental Effects

A summary of the environmental effects criteria is provided in Table 4 with further details on each refined alternative provided in the following sections.

Table 4: Refined Alternative Environmental Effect Criteria Summary

Evaluation Parameters	BRT Refined Alternative 2	HRT Refined Alternative 3	CRT Refined Alternative 4
	Route 1 - Tamiami Terminal to MIC	Tamiami Terminal to MIC (no transfer to Dadeland South Station)	BRT Shuttle - Tamiami Terminal to Dolphin Station CRT - Dolphin Station to the MIC
	Route 2 - Tamiami Terminal to Downtown		
	Route 3 - Dolphin Station to MIC		
Environmental Effects Criteria			
Draft Potential Noise Impacts	Medium	Medium-High	High
Potential Number of Parks Affected	15 Parks	15 Parks	15 Parks
Contamination/Hazardous Waste Site Impacts	65 Sites	55 Sites	87 Sites
Construction Impacts	Medium	High	Medium-High

8.3.1 Noise and Vibration

The noise and vibration assessments for the refined alternative study area were conducted in accordance with the *FTA Transit Noise and Vibration Impact Assessment Manual*, dated May 2006 (also referred to as the FTA Manual). The noise-sensitive properties within the refined alternative study area with the potential to be adversely affected by the project alternatives were identified through field reviews of the project corridor, GIS analysis and reviews of Miami-Dade County property records.

The noise analysis identified a number of properties with exposure to noise levels reaching the lowest range of an FTA moderate impact at 6 and 8 properties under the CRT Alternative.

Furthermore, severe noise impacts occurrences were limited to one location, Site R14, the Miami Airport Hilton Blue Lagoon Hotel under the proposed HRT refined alternative. In general, the moderate impacts reported under the CRT refined alternative are the direct impact of the CRT transit movements.

The acoustic effectiveness and general feasibility and reasonableness of any proposed abatement measures will be considered as part of the next phase of the project assessment process once a locally preferred alternative is selected. This will allow for further refinements in estimated noise exposure levels and acoustic effectiveness of any recommended mitigation measures, including the potential noise reduction effectiveness of quiet zone technology. Potential rail transit vibration abatement measures, such as resilient fasteners and ballast mats and their effectiveness in reducing vibration, will also be considered as part of the next project phase assessment once a preferred transit alternative is selected.

8.3.2 Potential Parks Affected - Section 4(f) Impacts

Fifteen (15) potential Section 4(f) resources including parks, recreational facilities and trails, have been identified within the study area and are shown in Table 5. Field reviews were conducted on June 5, 2017 to confirm the findings of the desktop analysis. The desktop review for parks, recreational facilities and trails for the western study area was conducted in September 2020. No permanent use of these resources is anticipated based on the currently proposed refined alternative alignments. If needed, an exception for temporary occupancy (use) of Section 4(f) property may be required during construction.

Table 5: Parks, Recreational, Section 4(f) Potential

ID	Name	Address/Location	Owner	Comments
1	Jose Villalobos Dominoes Park	10620 SW 7 th Terrace, Sweetwater	City of Sweetwater	The city acquired the land through a grant from the State of Florida. It is an area for residents to play dominoes
2	Carlow Park	10601 SW 5 th Street, Sweetwater	City of Sweetwater	The Claude and Mildred Pepper Senior Activities Center is onsite. A tot lot, tennis, racquetball and basketball courts are present.
3	Tamiami Linear Park / James M. Beasley Linear Park	Runs along north side of Tamiami Trail from SR 821 to SW 107 th Avenue	Miami-Dade	National Park Project (ID 12-00221) / Sweetwater Linear Park Flood Protection, South Florida Water Management District (SFWMD)
4	Snapper Creek Trail Corridor	Extends south along C-2 Canal from Tamiami Trail for approximately 5.6 miles	Miami-Dade	Northern section of trail ending at Tamiami Trail (US 41) is proposed (and funded)
5	Tamiami Canal Park	SW 122 nd Avenue to Turnpike	Miami-Dade	Located along Tamiami Canal
6	Miccosukee Link Corridor	Starts at SR 821, runs west along Tamiami Canal for ~5.9 miles.	Miami-Dade	FDEP Office of Greenways and Trails, Land Trail Opportunities and Priorities. Proposed in the River of Grass Greenway (ROGG) Feasibility and Master Plan. This gateway is near the corner of SW 8 th Street and SW 157 th Avenue, near the eastern terminus of the ROGG Study Area
7	Ronselli Park	250 SW 114 th Avenue., Sweetwater	City of Sweetwater	Park has facilities for baseball, t-ball, soccer, football, basketball, and racquetball, Jorge Mas Canosa Youth Center

ID	Name	Address/Location	Owner	Comments
8	Robert King High/ Carlos Arboleya Campground	7025 W Flagler Street, Miami	City of Miami	Large active park with numerous sports fields (basketball, baseball, soccer), swimming pool, hiking trails and campground.
9	Ludlam Trail Corridor	Crosses corridor at NW 72 nd Avenue, extends north to south.	Miami- Dade	FDEP Office of Greenways and Trails, Land Trail Opportunities and Priorities. Proposed 6-mile trail within abandoned FEC R/W. The land was purchased by Miami-Dade in 2018 and the trail will be constructed in multiple phases.
10	Perimeter Trail	Generally runs around the perimeter of the Miami International Airport	Miami- Dade	FDEP Office of Greenways and Trails, Land Trail Opportunities and Priorities. Proposed approx. 9.8 miles long trail to surround Miami International Airport.
11	Antonio Maceo Park	5135 NW 7 th Street, Miami	City of Miami	On Blue Lagoon, boat ramp, playground and picnic area
12	Kinloch Park	455 NW 47 th Avenue, Miami	City of Miami	Basketball, playground
13	Melreese Golf Course	1802 N 37 th Avenue Miami	City of Miami	Public golf course. This site is being consider for the new Major League Soccer Stadium.
14	Grapeland Heights Park / Water Park	1550 NW 37 th Avenue, Miami	City of Miami	Urban green space with a ball field, tennis courts & seasonal water park.
15	North Trail Park	780 NW 127 th Avenue, Miami, FL 33182	Miami- Dade	Popular urban park offers a recreation center, sports courts & fields, a playground & picnic space.

8.3.3 Contamination/Hazardous Waste Site Impacts

Potential and known contamination sites were identified within 500 feet of the proposed East-West corridor, except for landfills and superfund sites, which included a one-mile buffer. A contamination risk rating system was used to evaluate the likelihood that a contaminated site may have impact on the project. The rating system provides information needed to plan proper handling of contamination through avoidance, remediation, or mitigation. There are four contamination risk rating categories (No, Low, Medium or High) that are appropriately assigned to each property or site evaluated for potential contamination impacts to the project.

Between 87 and 55 sites may have potential impacts within the refined alternative study area, depending on mode. These were identified by reviewing available databases of potentially contaminated sites. Known contaminated sites were confirmed by a desktop Geographic Information Systems (GIS) analysis. Potentially contaminated sites (i.e., 'housekeeping' sites) were identified by field survey and then researched to determine if file information was available. The following summarizes potentially impacted sites for each alternative.

- BRT Refined Alternative – 65 sites, 6 High, 11 Medium, 42 Low; Brownfield (6)
- CRT/BRT Refined Alternative – 87 sites, 15 High, 18 Medium, 48 Low; Brownfield (6)
- HRT Refined Alternative – 55 sites, 7 high, 8 Medium, 33 Low; Brownfield (7)

8.3.4 Construction Impacts

Construction impacts vary for each refine alternative. The BRT Alternative 2 - Refined is expected to have "medium" impacts due to the proposed shoulder improvements, construction of new ramps, interchange improvements and construction of the proposed station, and repurposing of the lanes on NW 7th Street to accommodate the BRT lanes. The level of construction-related

impacts with the HRT Alternative 3 – Refined are considered high as most of the guideway is elevated with some sections over the Turnpike and SR 836. In addition, the HRT Alternative 3 - Refined requires a longer construction period than the other alternatives. Construction impacts with the CRT Alternative 4 - Refined are ranked low since most of the work required to double-track the line can occur away from the vehicular travel lanes. Impacts will be concentrated at the railroad crossings to construct the second track.

8.4 Recommended Refined Alternative

The BRT, HRT, and CRT refined alternatives were evaluated relative to the criteria described above and summarized in Table 6. Each alternative has strengths, but overall, the BRT Refined Alternative performs the best when all criteria are taken into consideration. The following key points helped the BRT refined alternative stand out as the Recommended Alternative.

Cost Criteria

- Most affordable – 80 percent less expensive than the HRT refined alternative and less than 40 percent of the cost of the CRT refined alternative
- Achieves a better cost effectiveness rating of “medium-low” compared to a “low” rating to lower overall cost compared to the HRT and CRT refined alternatives

Mobility Criteria

- Moves more people than the CRT refined alternative
- Similar to the HRT refined alternative, provides a one seat-ride to Downtown
- Most competitive travel time from Tamiami Terminal to the MIC due to lesser number of stations

Environmental Effects Criteria

- Minimal noise impacts
- Minimal construction impacts as most occurs on inside shoulders, outside of travel lanes

In addition to the evaluation criteria above, the following supports selection of the BRT refined alternative as the Recommended Alternative for the East-West Corridor:

- The BRT refined alternative builds on already implemented BRT service in the Corridor, with the 836 Express routes running in the outside lanes of SR 836 and providing point-to-point service from FIU, Tamiami, and Dolphin Terminal to the MIC and Downtown Miami.
- The BRT refined alternative also supports and complements the SMART plan's proposed Bus Express Rapid Transit (BERT) on the Turnpike. The connection/transfer between the Turnpike BERTs and the East-West's BRT refined alternative would take place at the recently completed Dolphin Station. While the Dolphin Station, BERT service on the Turnpike, and the East-West's BRT refined alternative may be implemented/constructed at different times, they are all part of the integrated, phased approach to providing regional mobility envisioned in the SMART Plan.
- The BRT refined alternative also connects major proposed and existing developments to regional transportation hubs. Major developments and destinations include: the proposed American Dream Mall (largest Mall in the US with three million square feet of retail and entertainment space), the proposed Dolphin Terminal 45-acre Transit Oriented Development, Florida International University (home to close to 60,000 students), and Miami International Airport with more than 40 million passengers a year.

Table 6: Refined Alternative Analysis Summary

Evaluation Parameters	BRT Refined Alternative 2	HRT Refined Alternative 3	CRT Refined Alternative 4
	Route 1 - Tamiami Terminal to MIC	Tamiami Terminal to MIC (no transfer to Dadeland South Station)	BRT Shuttle - Tamiami Terminal to Dolphin Station CRT - Dolphin Station to the MIC
	Route 2 - Tamiami Terminal to Downtown		
	Route 3 - Dolphin Station to MIC		
Cost Criteria			
Construction / Capital Cost (including Right-of-Way Cost)	\$418.4 M	\$2,346.7 M	\$1,046.4 M
Operations and Maintenance (O&M) Cost	\$20.9M to \$25.6M	\$39.9M to \$48.7M	\$27.0M to \$33.0M
Cost Effectiveness (New Starts)	Medium - Low	Low	Low
Time of Implementation (construction period only)	2 to 3 Years	6 to 8 Years	4 to 5 Years
Mobility Criteria			
Mode Shift from Auto to Transit (Daily Vehicle Mile Travel Reduction from No-Build)	25.2K to 30.8K	53.1K to 64.9K	15.9K to 19.5K
Route Level Ridership 2040 Route-level Daily Ridership (STOPS Model)	9,610 to 10,680	19,520 to 23,860	6,630 to 7,290
Travel Time - Tamiami Station to MIC (minutes)	24	25	28
Environmental Effects Criteria			
Draft Potential Noise Impacts	Medium	Medium-High	High
Potenital Number of Parks Affected	15 Parks	15 Parks	15 Parks
Contamination/Hazardous Waste Site Impacts	65 Sites	55 Sites	87 Sites
Construction Impacts	Medium	High	Medim-High

8.5 Recommended Refined Alternative Phasing

The recommended refined alternative described in Table 7, below, proposes to maximize leveraging of federal funding by phasing the Recommended BRT Alternative into two projects, under \$300M each in order to be eligible for Small Starts funding under the FTA's CIG program. Table 7 provides a summary of the cost and ridership for each of the proposed project phases.

Table 7: Recommended BRT Phasing Summary

Recommended BRT Refined Alternative 2 Phases	Estimated Capital Costs (\$2020)	Estimated O&M Costs (Average Annual)	Ridership (Average of 2020 and 2040 Daily Riders per Day)	Cost Effectiveness (Small Starts)
Phase I BRT Route 1 – Tamiami Terminal to MIC via Dolphin Terminal BRT Route 2 – Tamiami Terminal to Downtown Miami via Dolphin Terminal	\$265 M	\$15.5-\$18.9 M	7,110 to 8,690	Medium-High
Phase II BRT Route 3 – Dolphin Terminal to MIC	\$153 M	\$5.4 to \$6.6 M	2,485 to 3,040	Medium

9 Public Involvement

Table 8 lists meetings held or scheduled in addition to the meetings and briefings identified in the Executive Summary prepared for the April 2020 Miami-Dade TPO Governing Board Meeting.

A Public Kickoff Meeting was held for both elected/appointed officials (June 13, 2017) and the public (June 15, 2017). Elected officials have been briefed on the status of the project regularly since that time as shown in Table 8. In April 2018, the Department hosted two Corridor Workshops at various locations along the Corridor to obtain input from the community on the project and possible alternatives. In January 2019, two Alternatives Public Workshops (APWs) were held to provide interested members of the community the chance to provide feedback on several possible alternatives for the project.

Throughout the life of the project, the team has also engaged the Project Advisory Group (PAG) to gauge public opinion and discuss the projects with stakeholders within the Corridor at different phases. The PAG meetings were held on March 20, 2018, January 9, 2019, and March 31, 2020.

Overall community feedback is that improvements are needed to be implemented as population will continue to grow in the corridor and mobility will continue to be an impediment to the region's growth and quality of life of its population. Implementation of more transit service in the corridor is viewed as a positive approach to addressing mobility issues. Below is a summary matrix of all past briefings and presentations for this project.

Since April 2020, the project concepts have been refined. During September and October 2020, partner briefings were held to review the refined concepts with the Florida Department of Transportation, Miami-Dade Expressway Authority, Miami-Dade Transportation Planning Organization staff and Miami-Dade Transportation Planning Organization Governing Board members. Conceptual alignments, station layouts and station renderings were reviewed at the briefings.

Table 8: Public involvement Activities

Subject	Location	Date
Miami-Dade Expressway Authority Briefing	Virtual Meeting	September 21, 2020
Miami-Dade Transportation Planning Organization	Virtual Meeting	September 25, 2020
City of Doral Briefing	Virtual Meeting	September 29, 2020
Commissioner Martinez Briefing	Virtual Meeting	October 7, 2020
Commissioner Sosa Briefing	Virtual Meeting	October 9, 2020
Florida Department of Transportation Briefing	Virtual Meeting	October 9, 2020
Commissioner Bovo	Virtual Meeting	October 13, 2020

Subject	Location	Date
Commissioner Diaz	Virtual Meeting	October 14, 2020
Mayor Oliver Gilbert	Virtual Meeting	October 15, 2020
Mayor Martell	Virtual Meeting	October 15, 2020
Mayor Losner	Virtual Meeting	October 15, 2020
Commissioner Edmonson	Virtual Meeting	October 16, 2020
Commissioner Suarez	Virtual Meeting	October 19, 2020
Commissioner Higgins	Virtual Meeting	October 19, 2020
Commissioner Levine Cava	Virtual Meeting	October 19, 2020
Commissioner Heyman	Virtual Meeting	October 20, 2020
Mayor Bien-Aime	Virtual Meeting	October 20, 2020
School Board Member Hantman	Virtual Meeting	October 20, 2020
Mayor Suarez	Virtual Meeting	October 21, 2020
Commissioner Souto	Virtual Meeting	October 21, 2020
Commissioner Monestime	Virtual Meeting	October 22, 2020
Commissioner Steinberg	Virtual Meeting	October 22, 2020
Vice Mayor Lago	Virtual Meeting	October 22, 2020
Council Vice-President, Mr. De La Rosa	Virtual Meeting	October 22, 2020

10 Funding Considerations

Funding to implement transit improvements on the East-West Corridor will come from a variety of sources, including local, state, federal and private funds.

Miami-Dade County is seeking to concurrently implement the Rapid Transit Corridors and Bus Express Rapid Transit Network identified in the SMART Plan.

As each corridor advances, the Miami-Dade TPO Governing Board will make decisions about prioritizing projects, allocating funding from existing revenue sources, and possibility executing public-private partnerships to help facilitate the implementation of the overall vision.

Since the adoption of the SMART Plan in 2016, the Miami-Dade TPO Governing Board has already taken proactive steps to address the funding challenges associated with implementing these major transit projects.

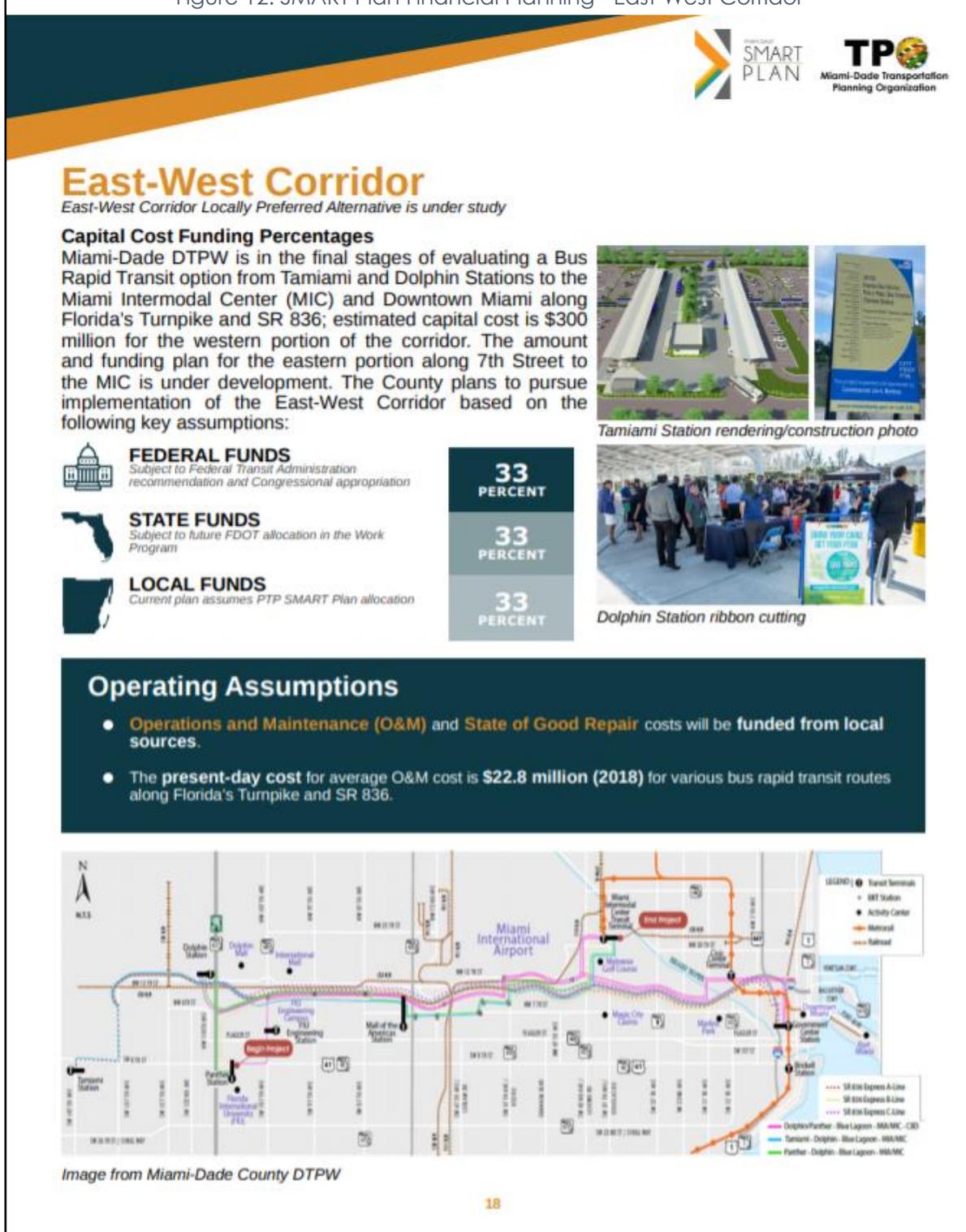
TPO RESOLUTION #41-17

**RESOLUTION ESTABLISHING THE FINANCIAL PLAN FRAMEWORK
FOR THE STRATEGIC MIAMI AREA RAPID TRANSIT (SMART) PLAN**

In September 2017, the Miami-Dade County TPO Governing Board adopted Resolution 41-17, which established a financial plan framework for the SMART Plan. This resolution identified potential funding sources that the County intends to utilize to execute its transit vision. Specific to the East-West Corridor, the TPO envisions a funding partnership equally splitting Federal, FDOT, and Local funds for capital costs. The federal portion would come from an FTA Capital Investment Grant program allocation for a New Starts and/or Small Starts grant. The TPO would also commit a combination of local funds to cover annual operating costs for a minimum of 30-years. The TPO also recommends utilizing local funds for State of Good Repair projects. Finally, while the current TPO SMART Plan funding strategy anticipates using the PTP SMART Plan allocation as a local match, TPO Resolution #41-17 allows the County to utilize other local funding, including:

- Tax Increment Financing
District Local Option Gas Tax
- Developer Contributions
- State Match
- Federal Match
- Transportation Infrastructure Finance
and Innovation Act (TIFIA)
- Special Taxing District
- Municipal Contribution
- Miami-Dade County General Fund
Allocation

Figure 12: SMART Plan Financial Planning - East-West Corridor



Source: 2020 Financial Report: SMART Plan Financial Planning, Financial Modeling and Strategy, June 2020