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Transit Corridor Systems Planning Study

PHASE II

Prepared for:

Florida Department of Transportation | District Six

Intermodal Systems Development Office

Project Manager | Neil Lyn

June 2015

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1. Introduction

The Florida Department of Transportation's District Six Intermodal Systems Development (ISD) Office is overseeing the Second Phase of the Transit Corridor Systems Planning Study to evaluate potential ridership estimates for various transit corridors within Miami-Dade County.

1.1 Purpose

The purpose of this study is to perform a systems planning level analysis to evaluate the purpose and need for implementation of potential transit service within multiple study corridors. The intent of this study is to provide a fresh look at potential transit corridors throughout Miami-Dade County. This report will identify the travel markets for the County as a whole and for individually selected corridors, while also providing an evaluation of the estimated patronage for selected transit corridors.

1.2 Background

Previous to this report, an initial Phase I Transit Study was performed for the Miami Intermodal Center (MIC)-Dadeland Transit Corridor, which intended to make use of the existing Florida East Coast (FEC) Railroads' Oleander Corridor in Miami-Dade County. This corridor was long considered a viable option since the right-of-way was assumed to be available. Through the course of this study it was determined that the MIC-Dadeland Transit Corridor may not have been the most appropriate investment or the highest demand transit corridor in Miami-Dade County, due to the transit ridership results and demand levels.

As a result of the Phase I study, FDOT's ISD staff wanted to take a fresh look at potential transit corridors without being influenced by jurisdictional concerns or political viewpoints, but to let the data speak for itself. Thus, this Phase II study will provide new potentially viable transit options throughout the County and present initial transit ridership estimates. This new study will identify up to ten potential transit corridors.

1.3 Study Data

For this study, a variety of data were employed to determine the transit needs of each possible corridor. The following provides a description of these various data types.

1.3.1 SERPM Socio-Economic Data

Socio-economic projection data is developed by planning agencies to estimate future year population and employment within specific zones of their municipal area. This data is then used as a basis for identifying trip patterns and estimating highway and transit demands. To accomplish these tasks travel demand models are employed. Model output data is a key component in determining travel markets relevant to highway and transit improvement projects.

Socio-economic data was developed by the Miami-Dade Metropolitan Planning Organization (MPO) for the year 2016. This data is used as input to the Southeast Regional Planning Model (SERPM), version 6.7. Population and employment data are provided by transportation analysis zones (TAZs) which can be as small as a city block, as in Downtown Miami, or even as large as several square miles. These two data are critical to determining the location of where work trips start and end.

1.3.2 2010 Census Data

Census data was most recently collected for 2010. From this data set, several key components were used as part of this analysis. Like the socio-economic data, this data is also provided by TAZ. The first component was information on household income, which will identify areas of households living at or below $25,000 annual income. The next piece of data was the percentage of zero-car households within a TAZ. Finally, the last piece of data identified the percentage of residents older than 65 years of age. Each of these components will help identify areas of high transit need.

1.3.3 Miami-Dade County Activity Centers and Transit Hubs

As part of this study activity centers, existing park-and-ride locations and future transit hubs were reviewed and included in the analysis. Activity centers include places of interest such as large shopping malls, colleges, government offices and tourist destinations. The activity centers were reviewed by the consultant team using our collective common knowledge to determine the relevance of each location to transit usage and whether the location would have a significant enough number of trips to warrant the inclusion in the maps. An example of this was the elimination of several private, for-profit colleges which are largely unknown to most people.

Each of these three location types influenced the initial decision to select particular corridors. Additionally, these locations will be beneficial when determining the locations of transit stops/stations in further analyses.

1.4 MPO Transit Studies

As requested by FDOT staff, a review was performed of transit studies conducted on behalf of the Miami-Dade County Metropolitan Planning Organization (MPO) over the last ten years. During this period a total of 18 studies were performed. Appendix A includes a list of these transit projects, the years they were completed, and a summary of the study.

2. Initial Corridor Identification

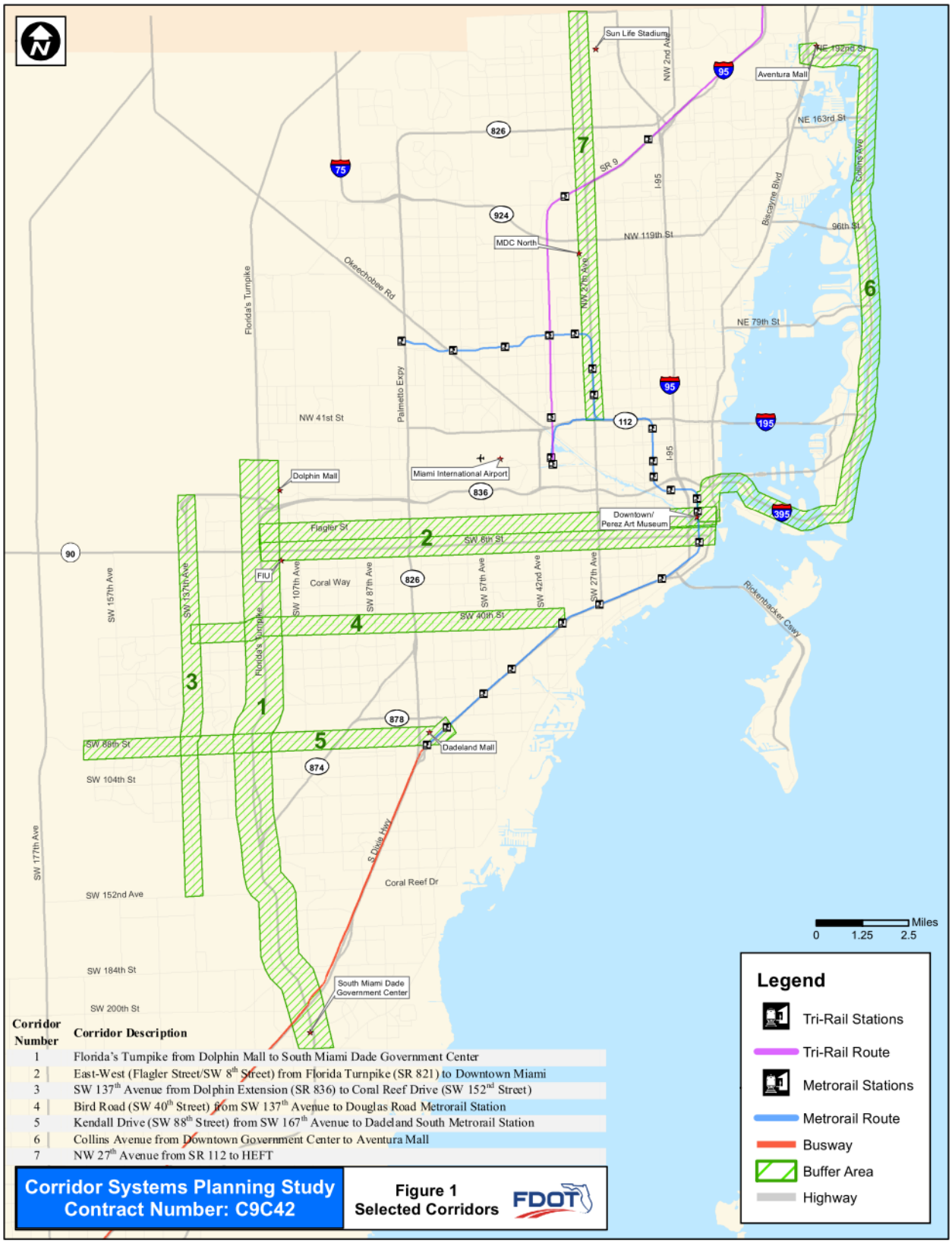
Initially ten corridors were selected for further analysis. The selection of these ten corridors was based on major roadways connecting areas of high population and employment, while also considering location of existing major activity centers, park-and-ride sites and future transit hubs. Areas of high population or employment were identified where their densities were higher than the county average. Results and findings from previous studies were also taken into consideration. The initial ten corridors were as follows:

1. East-West Corridor (Flagler Street/SW 8th Street) from Florida's Turnpike (SR 821) to Downtown Miami
2. Miami Beach Circular Corridor from Downtown Miami along I-395 to Miami Beach then returning via I-195/I-95
3. SW 37th/27th Avenue from Grand Avenue to Miami Intermodal Center (MIC)
4. Kendall Drive/SW 88th Street from SW 117th Avenue to Dadeland Mal
5. Coral Reef Drive/SW 152nd Street from SW 117th Avenue to Dadeland via U.S. 1 Busway
6. Biscayne Boulevard from Downtown to Miami Dade-Broward County Line
7. SR 826/Palmetto Expressway from NW 7th Street to Miami Dade-Broward County Line
8. NW 25th/41st Street from NW 7th Avenue to Miami Dade College West at the Florida's Turnpike
9. Okeechobee Road from MIC to SR 821/Florida's Turnpike
10. Florida's Turnpike (SR 821) from Dolphin Mall to South Miami Dade Government Center at SW 211th Street.

From this initial list, the consultant's team brainstormed with FDOT staff to refine the list of corridors and establish a final group of six corridors. These corridors are illustrated on Figure 1 and described below:

1. Florida's Turnpike from Dolphin Mall to South Miami Dade Government Center
2. East-West (Flagler Street/SW 8th Street) from Florida's Turnpike (SR 821) to Downtown Miami
3. SW 137th Avenue from Dolphin Extension (SR 836) to Coral Reef Drive (SW 152nd Street)
4. Bird Road (SW 40th Street) from SW 137th Avenue to Douglas Road Metrorail Station
5. Kendall Drive (SW 88th Street) from SW 167th Avenue to Dadeland South Metrorail Station
6. Collins Avenue from Downtown Government Center to Aventura Mall.

Figure 1 – Selected Study Corridors



Corridor Number	Corridor Description
1	Florida's Turnpike from Dolphin Mall to South Miami Dade Government Center
2	East-West (Flagler Street/SW 8th Street) from Florida Turnpike (SR 821) to Downtown Miami
3	SW 137th Avenue from Dolphin Extension (SR 836) to Coral Reef Drive (SW 152nd Street)
4	Bird Road (SW 40th Street) from SW 137th Avenue to Douglas Road Metrorail Station
5	Kendall Drive (SW 88th Street) from SW 167th Avenue to Dadeland South Metrorail Station
6	Collins Avenue from Downtown Government Center to Aventura Mall
7	NW 27th Avenue from SR 112 to HEFT

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Figure 1
Selected Corridors

3. Selected Corridor Descriptions

Below is a description of the seven corridors selected for further analysis. Figures 2 through 8 on the following pages provide maps of each corridor.

3.1 Florida's Turnpike Corridor

A transit alternative along this corridor will alleviate traffic congestion and provide mobility alternative along the Turnpike and Palmetto Expressway, which are one of the busiest facilities in Miami-Dade County. This corridor will serve activity centers, such as: the South Dade Government Center, Southland Mall, Zoo Miami, Miami-Dade College, Kendall Campus, Kendall Village, Palms at Town and Country, Florida International University (FIU), Dolphin Mall and IKEA.

3.2 East-West Corridor

Various transit alternatives such as heavy rail, Bus Rapid Transit, and Enhanced Bus Service have been considered for SR 836, Flagler Street and sections of SW 8th Street in the past, in order to connect activity centers such as FIU, Mall of the Americas, Westchester Shopping Center, Blue Lagoon, the MIC, Magic City Casino, Marlins Park, Downtown Miami and Brickell. This transit alternative will serve one of the most congested corridors in Miami-Dade County, since people living in western areas like Kendall and Sweetwater commute to the eastern side of the County to get to work in areas like Blue Lagoon, Downtown and Brickell. The other advantage of this corridor is that it would serve local trips given the amount of residential communities, commercial establishments and offices located along Coral Way, 8th Street, or Flagler Street.

3.3 SW 137th Avenue Corridor

This corridor is a key component of the transportation network in western Miami-Dade County running from SW 200th Street north to NW 12th Street and the Dolphin Expressway Extension. For this study, the transit corridor would operate from SW 152nd Street at Zoo Miami. In recent years this corridor has experienced significant commercial growth, such as the shops at London Square Mall, and continues to provide access to the Kendall-Tamiami Executive Airport. Additionally, this corridor provides walkable access to numerous large residential developments.

3.4 Bird Road Corridor

As a major east-west corridor, Bird Road would serve as a connection between SW 137th Avenue and the Metrorail at Douglas Road. This corridor serves a strong mix of both commercial and residential transit needs, while also providing access to Coral Gables. Additionally, this corridor will provide a connection between the Kendall area, in the City of Miami, and to Downtown Miami and Brickell areas through a connection to Metrorail.

3.5 Kendall Drive Corridor

This corridor will connect the West Kendall area with Dadeland, Sunset Place and eventually with Downtown Miami and Brickell given that this proposed corridor will tie in with the existing Metrorail system. This transit corridor will alleviate traffic congestion along the Turnpike and Palmetto since these are the major facilities connecting trip origins in Kendall (high population density) with trip destinations in Brickell and Downtown Miami (high employment density). This

corridor will serve activity centers, such as: Kendall Village, Palms at Town and Country, and Miami-Dade College's Kendall Campus.

3.6 Collins Avenue Corridor

This corridor will serve several areas of Miami-Dade County with the highest population and employment density, such as Aventura, Brickell/Downtown and Miami Beach. The connection between these areas will benefit tourism and will help overcome the growing challenge for parking.

A transit alternative along this corridor will serve activity centers, such as: Aventura Mall, American Airlines Arena, Adrienne Arsht Center, Jungle Island/Miami Children Museum, Lincoln Road Mall, Miami Beach Convention Center, and all the residential communities including Aventura, Sunny Isles Beach, Surfside, Bal Harbor, Miami Beach and businesses located in Downtown, Brickell and South Beach. It also has the potential to connect to the existing Metrorail system at the Government Center Station in Downtown Miami.

3.7 NW 27th Avenue Corridor

This corridor will provide a transit alternative to high population, low income and zero-car household areas like Miami Gardens and Opa-Locka. Major activity centers along the corridor are Miami-Dade College (North Campus) and Sun Life Stadium. This corridor will also provide potential connection with Metrorail (Northside, Dr. Martin Luther King, Jr., Brownsville stations) and Tri-Rail (Opa-Locka station).

Figure 2 – Florida's Turnpike Corridor

Figure 3 – East-West Corridor

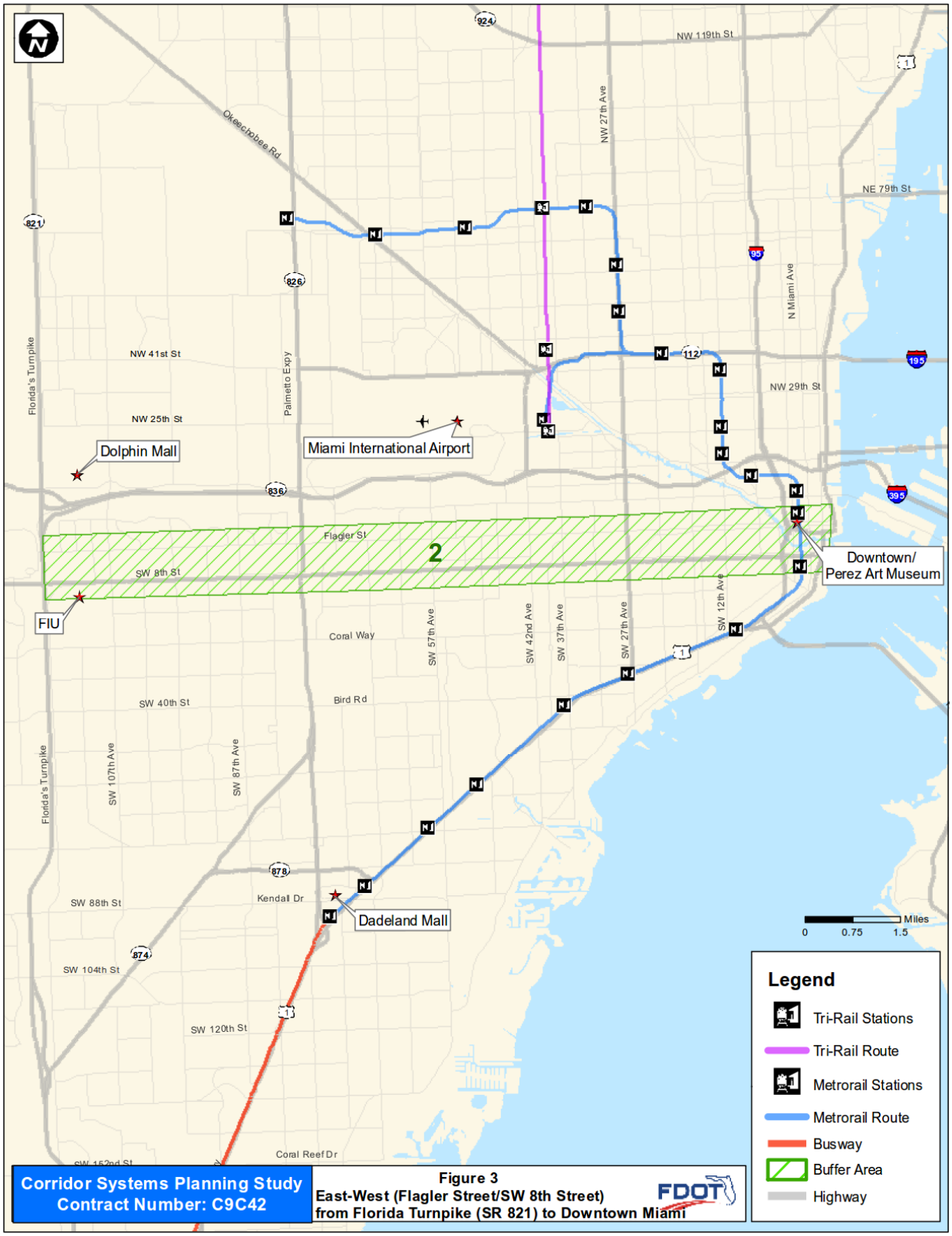


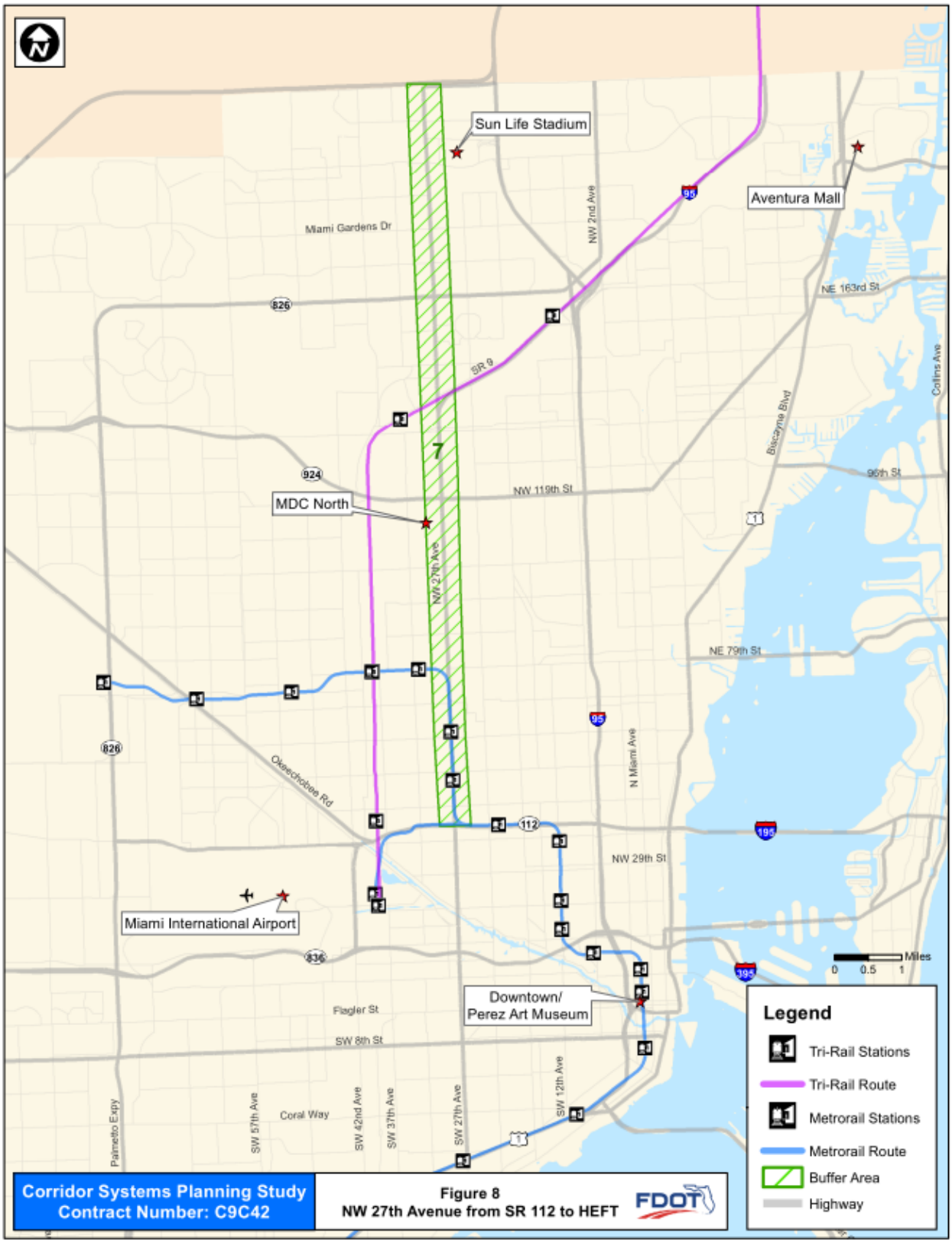
Figure 4 – SW 137th Avenue Corridor

Figure 5 – Bird Road Corridor

Figure 6 – Kendall Drive Corridor

Figure 7 – Collins Avenue Corridor

Figure 8 – NW 27th Avenue Corridor



4. Corridor Ranking

To determine which corridors would have the highest benefit to transit dependant riders, an in-depth analysis of 2010 Census data was performed using GIS software. Initially, a ¼ mile buffer area representing typical travel shed along a transit line, was established around each individual corridor in order to establish an area of influence. The influence area along Corridor 1, Florida's Turnpike, was expanded to one mile, recognizing that such a corridor would serve long distance trips rather than provide direct access to the surrounding and adjacent land uses. On the other hand, the buffer area for the East-West Corridor was extended ¼ mile north of Flagler Street and ¼ mile south of SW 8th Street in order to cover the total land uses adjacent to the main arterials. These buffers were used to extract population and employment densities and the following transit dependant criteria from the Census data at the TAZ level:

1. *Low Income Households* – where the percentage of households with an income of less than $25,000 per year, within a TAZ, is higher than the County's average percentage of 29 percent.
2. *Zero Car Households* – where the percentage of households with zero cars within a TAZ, is higher than the County's average percentage of 11 percent.
3. *Elderly Population* – where the percentage of households with residents of 65 years or older within a TAZ, is higher than the County's average percentage of 14 percent.

From this point, a matrix was developed which ranked each corridor by the density of both population and employment, as well as the three transit dependant criteria. As shown in Table 1, the top three corridors by rank were Collins Avenue (Corridor 6), East-West (Corridor 2), and Kendall Drive (Corridor 5). Additionally, a map is provided in Appendix B which overlays each of the seven corridors onto a traffic analysis zone (TAZ) map for population, employment and the three criteria explained above.

Table 1 – Corridor Ranking

Identified Corridor	2010 Population		2010 Employment		2010 Low Income Households		2010 Zero Car Households		2010 Age 65+ Population		Total Score	Total Rank
	Density (Per Acre)	Rank	Density (Per Acre)	Rank	Density (Per Acre)	Rank	Density (Per Acre)	Rank	Density (Per Acre)	Rank		
1-Florida's Turnpike	10.97	5	4.04	5	0.86	5	0.35	5	1.50	6	26	5
2-East-West	20.97	2	15.62	2	3.55	1	1.44	2	4.01	1	8	2
3-SW 137 Avenue	13.47	4	2.83	7	0.75	6	0.19	7	1.82	4	28	7
4-Bird Road	9.63	6	5.18	4	0.75	6	0.27	6	1.87	3	25	4
5-Kendall Drive	16.75	3	8.90	3	1.39	3	0.51	4	1.75	5	18	3
6-Collins Avenue	23.00	1	30.60	1	2.43	2	1.80	1	2.40	2	7	1
7-NW 27th Ave	9.08	7	3.74	6	1.28	4	0.63	3	1.19	7	27	6

In order to better gauge which facility along the East-West corridor would provide the most benefit, an additional analysis was performed for both Flagler Street and SW 8th Street. As shown in Table 2, Flagler Street proved to be the better corridor with both the highest total ranking as well as for each individual criteria. In order to connect major activity centers and maximize the potential ridership on that route, it is recommended that the Flagler Street route start at the Florida International University Campus, (SW 8th Street) before heading north on SW 107th Avenue to continue along Flagler Street.

Table 2 – East-West Corridor Ranking

East-West Corridor	2010 Population		2010 Employment		2010 Low Income Households		2010 Zero Car Households		2010 Age 65+ Population		Total Score	Total Rank
	Density (Per Acre)	Rank	Density (Per Acre)	Rank	Density (Per Acre)	Rank	Density (Per Acre)	Rank	Density (Per Acre)	Rank		
2-Flagler Street	23.46	1	19.93	1	3.86	1	1.6	1	4.39	1	5	1
2-SW 8th Street	18.37	2	11.6	2	3.18	2	1.23	2	4.02	2	10	2

Subsequent to the East-West Corridor analysis, a final corridor ranking was developed, as shown in Table 3. It was determined by the team and FDOT that the Turnpike Corridor would not be appropriate at this time, and was thereby removed from the list of corridors.

Table 3 – High Potential Transit Corridor Ranking

High Potential Transit Corridor	2010 Population		2010 Employment		2010 Low Income Households		2010 Zero Car Households		2010 Age 65+ Population		Total Score	Final Rank
	Density (Per Acre)	Rank	Density (Per Acre)	Rank	Density (Per Acre)	Rank	Density (Per Acre)	Rank	Density (Per Acre)	Rank		
1-Flagler Street	23.46	1	19.93	2	3.86	1	1.6	2	4.39	1	7	1
2- SW 137 Avenue	13.47	4	2.83	6	0.75	5	0.19	6	1.82	4	25	6
3-Bird Road	9.63	5	5.18	4	0.75	5	0.27	5	1.87	3	22	4
4-Kendall Drive	16.75	3	8.90	3	1.39	3	0.51	4	1.75	5	18	3
5-Collins Avenue	23.00	2	30.60	1	2.43	2	1.80	1	2.40	2	8	2
6-NW 27th Ave	9.08	6	3.74	5	1.28	4	0.63	3	1.19	6	24	5

5. Estimated Ridership

The final step of the study analysis involved estimating daily ridership for the selected transit corridors. This effort was performed using the Southeast Regional Planning Model (SERPM), version 6.5.4, which is the region's current approved model. Each of the selected corridor routes was coded into the model as representing a light rail transit (LRT) mode, light rail transit (LRT)/bus rapid transit (BRT) service on a separate guideway, with stations provided every mile, and fare set equal to that of Metrorail. Headways for each route were set to 10 minutes in the peak periods and 15 minutes during the offpeak. The model runs were performed using 2016 socio-economic data. The ridership estimates resulting from these model runs are summarized in Table 4.

Table 4 – 2016 Corridor Ridership Estimates

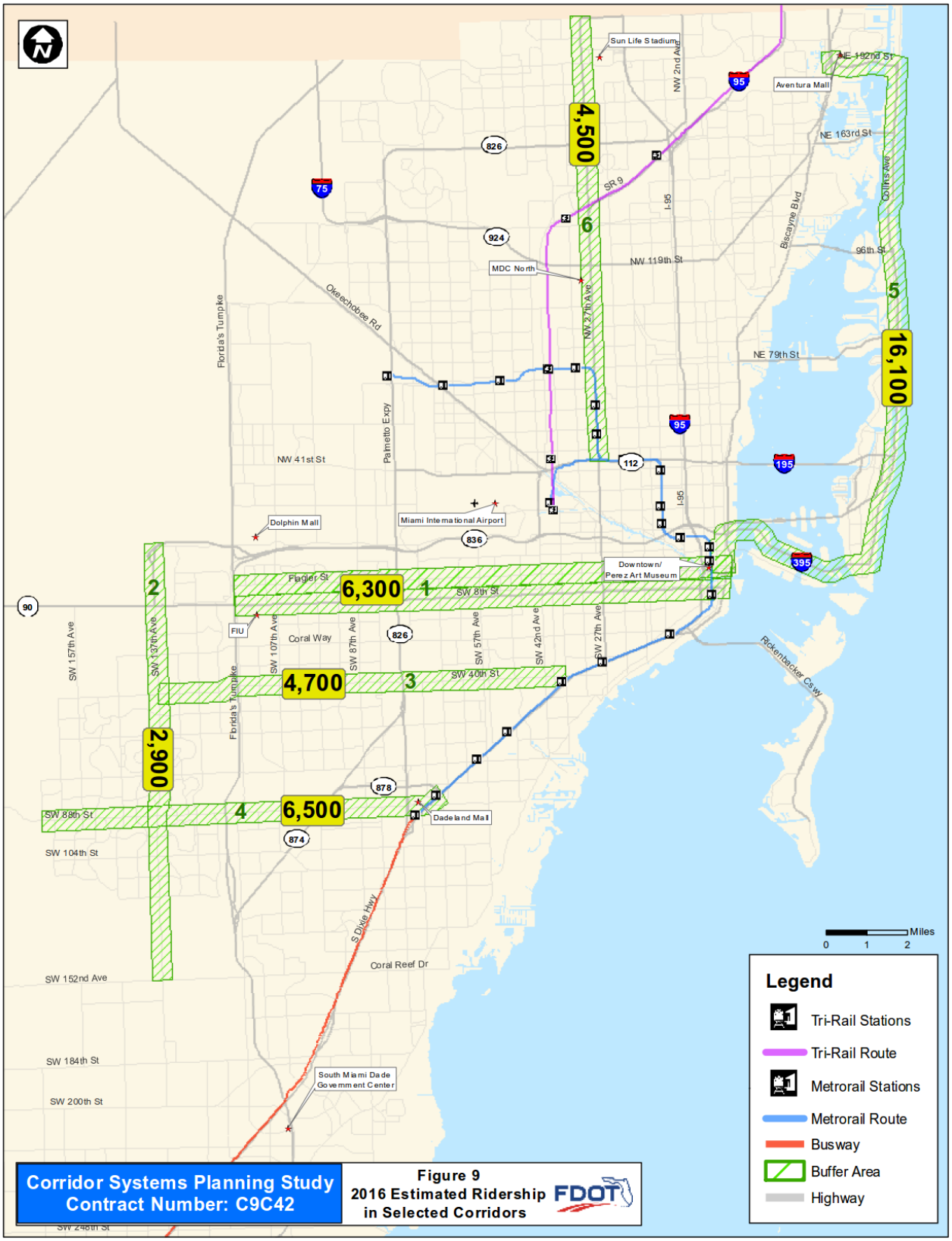
High Potential Transit Corridor	2016 Estimated Daily Ridership
1-Flagler Street	6,300
2- SW 137 Avenue	2,900
3-Bird Road	4,700
4-Kendall Drive	6,500
5-Collins Avenue	16,100
6-NW 27th Ave	4,500

Table 5 – Potential Transit Corridors influence on 2016 Metrorail Ridership Estimates

Scenario	2016 Metrorail Estimated Daily Ridership	Difference	% Change
NoBuild	87,104		
1-Flagler Street	87,131	27	0.03%
2- SW 137 Avenue	86,415	-716	-0.82%
3-Bird Road	87,147	732	0.85%
4-Kendall Drive	87,385	238	0.27%
5-Collins Avenue	89,700	2,315	2.65%
6-NW 27th Avenue	88,507	-1,193	-1.33%

Table 5 above shows how the six potential corridors considered, will influence 2016 Metrorail estimated daily ridership numbers. Of all six potential corridors, the Collins Avenue corridor increases 2016 estimated Metrorail daily ridership by close to three percent, whereas other corridor contributions is less than 1%.

Figure 9 – 2016 Corridor Estimated Daily Ridership Map



6. Conclusion and Next Steps

It is important to remember that the goal of this study was not to identify the single best transit corridor in Miami-Dade County, but to identify several possible corridors which would be a benefit to the existing transit system in their own right or in conjunction with other recommended corridors. As shown in both Tables 3 (High Potential Transit Corridors) and 4 (Corridor Ridership Estimates), the top three corridors were the same: 1) Flagler Street, 4) Kendall Drive, and 5) Collins Avenue. These three corridors ranked highest in both potential transit user need and in estimated 2016 daily ridership. Table 5 shows the contribution of these corridors towards Metrorail ridership, which confirms the potential benefit to be gained through the implementation of these transit routes.

Following the completion of this Phase II study, the next step of the process is to perform a more detailed feasibility analysis for each individual corridor or a selected group of corridors. These reports would further look into the potential for implementing the selected transit corridors by looking at right-of-way availability, identifying possible fatal flaws, as well as providing an initial cost (Capital and O&M) estimate for the project. Additionally, these studies will look into both LRT and BRT modes, with each operating either at-grade or via separated guideways. These potential corridors would require further coordination with the MPO and Miami Dade Transit for further implementation strategies.

Appendix A

List of Miami-Dade County MPO Transit Studies between 2004-2014

Appendix A – Miami-Dade MPO Transit Studies between 2004-2014

	Study Name	Year of Completion	Study Description
1	137th Avenue Corridor Study	2007	Purpose of the study: Examine the feasibility of making 137th Ave the fourth north/south facility between Homestead and Central Miami-Dade. The study evaluates roadway and safety improvement alternatives along SW 137th Ave from SW 344th St to the extension of SR 836. Objective of the 137th Street Corridor: 1) Increase capacity to accommodate future travel demand, 2) Improve access management, 3) Provide roadway continuity. 3 out of 7 alternatives developed meet the overall objectives of the study. The selected alternatives must be phased as follows: Phase I: Parkway Facility (Boulevard with context sensitive design), Phase II: 6-lane major North-South corridor, Phase III: 6-lane, grade separated high flow facility.
2	Bay Link Phase 2 (Miami-Miami Beach Transportation Corridor Study)	2004 (locally Preferred Alternative Report)	The refined LPA has approx. 18.04 route miles in length and includes 42 stations (the length does not include lead track required to access the yard and shop site). The downtown Miami Segment is approx. 6.02 route miles and has 16 stations (Includes Watson Island Station and 8 other stations that would be shared with City of Miami Streetcar Project). The MacArthur Causeway segment and Miami Beach segment are approx. 3.35 and 3.6 route miles respectively and have 26 stations (9 of these stations would be shared with the dedicated Miami Beach Corridor ("Green Line") which is approx. 5.05 route miles in length)
3	City of Miami Beach North & Middle Beach Transit Planning Study	-	The study corridor extends from 71st Street in North Beach to 17th Street in South Beach. The route traverses A1A along both Collins Ave and Indian Creek Dr where these two roads form a one-way pair. The corridor also includes east-west segments at 71st St, 41st St and 17th St. The corridor is served by 11 MDT bus routes and South Beach Local transit circulator.
4	Coastal Communities Transportation Master Plan	2007	Purpose of the Project : Produce short, mid and long-term multimodal solutions to transportation issues to the barrier island communities (City of Miami Beach, City of Aventura, City of Sunny Isles Beach, Town of Bal Harbour Village, Town of Bay Harbour Islands, Town of Surfside and City of North Bay Village). Study the existing and future sub-regional transportation network through data collection, analysis and public involvement (Traffic Pattern in the corridor and transit riders pattern was also studied. According to the study approx 74% of the transit trips cross Biscayne Bay). A total of 49 projects have been developed under four different criteria (Capacity Improvement, Corridor Enhancements, Alternate Mode, Policy Project). Intermodal Feasibility Study, Biscayne Blvd. Corridor Study {Aventura - Downtown Miami}, Causeway Flow Enhancements, Liason with South Florida Commuter Services projects came as top priority projects under four different criteria's mentioned above.
5	CSX Corridor Evaluation Study	2009	Objective of the study: Phase I evaluated the potential of creating a new CSX Rail alignment known as the Lehigh Spur starting at Oleander Junction (NW 12th Street\NW 72nd Avenue) at Miami International Airport (MIA) to link with the CSX GPC spur west of Krome Avenue near Kendall Drive (SW 88th Street). Phase II - Evaluated freight consolidation strategies and new alignment options. Phase III studied possible uses for the CSX tracks and right-of-way for other transportation or joint use purpose. The study concluded that CSX ROW between Oleander Junction and Metrozoo is viable. BRT is seemed as a favorable option from capital and funding perspective but building a BRT has several issues such as ROW acquisition, negotiations with CSX and building new CSX connection. The optimal BRT will use the CSX right-of-way from Kendall Drive south; use Kendall drive between the CSX and Metrorail Dadeland North station on reserved bus lanes and connect to the FEC corridor northward from Dadeland to Oleander Junction. Joint use of the FEC and CSX seems to be an optimal situation but will require additional study.

	Study Name	Year of Completion	Study Description
6	Douglas Road Transit Corridor	2014	Purpose of the Study: To evaluate premium transit options along Douglas Road from MIC to the Metrorail System on US 1. Five (5) different alternatives were analyzed along 42nd Ave/Le Juene Road, Ponce de Leon Blvd, 32nd Ave, 37th Ave, 27th Ave connecting from MIC to Metrorail Stations (Douglas Road/University). The corridor along 37th Ave has the shortest route and largest potential market. This alternative is the least expensive given the cost per potential rider. The study concluded that the Ponce de Leon Blvd alignment should be advanced as the 1st option followed by Le Juene road and the 37th Avenue.
7	Florida East Coast (FEC) Transit Connection Study	2009	Purpose of the Study: To identify potential transit connection alternatives on the FEC Ludlam Corridor (Width of corridor = 100 feet) between MIA and Dadeland North Metrorail Station. 4 alternatives were analyzed 1) Multi-use trail only, 2) Multi-use trail with busway transit, 3) Multi-use trail with at-grade passenger rail transit, 4) Multi-use trail with elevated passenger rail transit. The study determined busway alternative to be the preferred alternative for the following reasons: i) ability of ROW to accommodate the busway option, ii) bus service flexibility, iii) future extension opportunity to extend the South Dade busway service, iv) lower implementation cost than other alternatives, v) opportunity to provide signalized intersections crossings to enhance trail safety.
8	Implementation Plan for Enhanced Bus Service (EBS) along Biscayne Boulevard	2013	Purpose of the Study: To develop a detailed plan for the implementation of EBS along Biscayne Blvd. between Downtown Miami and Aventura Mall. The approx corridor length is 15 miles and the corridor is considered a high priority since it goes through the historic core of the county along FEC corridor and links Aventura, North Miami, North Miami Beach, Miami Shores, Midtown, Design District, Wynwood and Downtown Miami. Biscayne EBS would replace MDT's existing Route 93 (Omni Loop to be eliminated). The new system will provide 17 stations with 15 min initial peak period headway and 20 min off peak headways are suggested in this study along the route. Transit signal priority improvements are recommended at 11 intersections along the corridor. Queue Jump and By-Pass Lanes are also recommended at different locations. Estimated travel time savings are between 8.8% and 14% in northbound and southbound directions during AM and PM. Approximate cost estimated for Biscayne EBS project is around $32Million. (Note: In May 2012, MDT entered in Joint Participation Agreement (JPA) with FDOT, which will allow the agency to get matching funds through the State Transit Corridor Program).
9	Kendall-Link Alternatives Analysis Study	2007	Purpose of the Study: To Develop short, medium and long range rapid transit recommendations within Kendall area in MDC. Goal: To identify the cost-effective, productive and affordable means to use major transit capital investments and service improvements to strengthen mobility connections between Kendall area and other key regional activity centers in MDC Mixed traffic or curb lane alternative, exclusive lane or median BRT and an elevated BRT/HOT alternatives were analyzed. Tier I and Tier II included detailed alternative analysis, capital/maintenance/operating costs and traffic analysis. Four (4) corridors were identified under Tier I 1) Kendall Corridor {BRT, LRT, Metrorail}, 2) HEFT/107th Corridor {BRT, Metrorail}, 3) 826/874 Corridor {BRT}, 4) CSX Corridor {DMU}. Tier II analysis eliminated 826/874 corrdior and added 137th Ave corridor. Four (4) Corrdiors presented under Tier II analysis were 1) Kendall Drive {Exclusive BRT, Metrorail}, 2) HEFT Corridor {Metrorail [Extesnion of E-W Corridor]}, 3) CSX Corridor {DMU}, 4) 137th Ave. Corridor {BRT}. The study did not prioritize the options presented under Tier II analysis instead suggested further technical analysis.

	Study Name	Year of Completion	Study Description
10	Metrorail/Coconut Grove Connection Study Phase II	2007	Purpose of the Study: To examine the feasibility of establishing an exclusive ROW transit connection between Metrorail line and Coconut Grove Village Center. This study is divided into Phase I (Background Research and Technical Data Development) which identified 3 transit options BRT, LRT and Automated Cableway People Mover (ACPM). Phase II of the study conducted a preliminary planning analysis (Cost and traffic analysis) to determine the viability of the transit options. Analysis revealed that the current ridership numbers are way lower than the suggested ridership numbers and the associated costs are too high to support suggested BRT and LRT transit systems, whereas for ACPM system the direct ridership estimates are similar and very low as BRT and LRT systems the indirect ridership (dependent on attraction value) might make the system viable (the attraction value of this transportation mode is not determined from this study). The Study suggested three route options Route # 1A (BRT), 2A (LRT) & 3A (ACPM).
11	Modeling Support for Near Term Transportation Improvements Study	2010	Purpose of the Study: To provide travel forecasting services to support the MPO's and MDT's efforts to develop a Near-Term Public Transportation Plan for Miami-Dade County. The Plan focuses on the evolution of transit services within the County's People's Transportation Plan (PTP) corridors during the two-to-five year time frame. The travel forecasting helped to identify 1) the performance of proposed transit service improvements and 2) the impact of proposed service improvements on existing transit routes and system-wide transit services. The model run was performed on 3 corridors that have been part of County's PTP (Flagler Corridor {Enhancement to existing service (Route 51) - From P&R lot at SW 8th St and 147 Ave to Miami Govt. Center, Length - 15.5 miles, Stations - 19} , North Corridor {Enhancement to existing service (Route 97) - From P&R loat at NW 215 St and NW 27th Ave to MIC, Length - 13.5 miles, Stations - 9} and East-West Corridor {New Route - From P&R Lot at SW 8 St and SW 147 Ave to MIC, Length - 12.9 miles, Stations - 7} Note: All Station information is directional). The ridership forecasts indicate that service improvements will result in additional 1,292 daily riders for the three identified services and a system-wide increase of nearly 2,200 daily riders (Excludes STS). The service improvements will require an initial outlay of appro. $51.2 million in capital cost. The user benefits analyzed using FTA's SUMMIT program summarizes that transit users would save an equivalent of 262 hours of travel time when the proposed services are implemented.
12	NW 27th Avenue Enhanced Bus Service	2013	Objective of the project: To enhance transit service and increase transit ridership along the corridor, while working towards the long term goal of implementing rail transit. The corridor is from P&R at NW 215 St and NW 27th Ave to MIC. Transit stations are to be spaced at approx. 1 mile intervals along the corridor and at major destinations with 10 and 20 minutes peak and off-peak headways respectively. The major elements of the EBS include i) Transit Signal Priority, ii) Bus Queue jumps at 3 key intersections (NW 199th, 119th, 79th St), iii) Transit terminal and P&R facility, iv) State-of-the-art bus stations. v) Distinctive service branding. Total Capital Costs = Approx. $27.575 million and O&M cost = Approx. $ 3.737 million annually (Which is a $1.118 million increase over 297 Orange Max O&M costs annually).

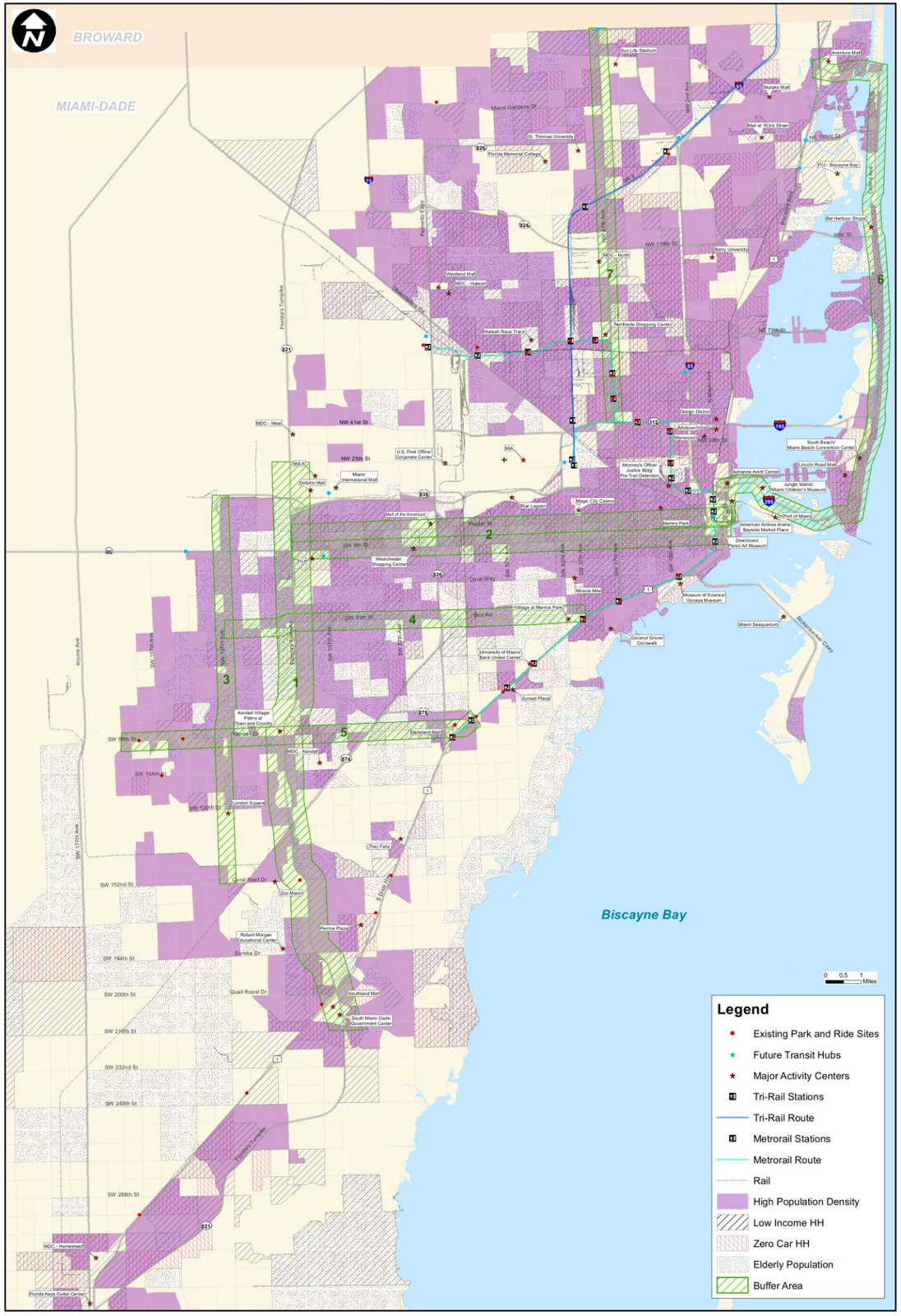
	Study Name	Year of Completion	Study Description
13	NW/NE 36th Street Study	2007	The objective of this study: Is to develop and evaluate mobility enhancement alternatives along the NW/NE 36th Street corridor (The study boundaries are NW/NE 54th St to the north, NW/NE 20th St to the South, NW 7th Avenue/S.R. 7/US 441 to the west, and Biscayne Bay to the east). LOS along east-west road segments are at LOS C & D whereas roadway segments in North-South directions are at LOS E & F. Volume to Capacity analysis revealed that the North-South surface streets are approaching their overall capacity and strategies will need to be developed to increase the person movement capacity in these corridors as the travel demand increase. Issues that were identified included traffic impacts associated with redevelopment, limited available capacity along north-south roadways, intersection capacity constraints at the intersections of NE 36th Street at NE 2nd Avenue/Federal Highway and NE 36th Street at Biscayne Boulevard, constrained right-of-way limits opportunities for roadway widening, safety, speeding, and cut through traffic. The recommended improvements along the corridor range from specific intersection improvements to a new fixed guideway transit lines.
14	South Dade Managed Lanes	2008	The objective of this study: To assess the feasibility of managed lanes concepts in the right-of-way for the South Dade Busway and to evaluate the revenue generating potential for improving the corridor. Three (3) alternatives were discussed in this study. Alt #1: Two-lane at-grade alternative, Alt #2: Grade separation of managed lanes at the locations identified in the Locally Preferred Alternative for the South Link Study. (7 grade separation structures were recommended across a total of ten cross-streets in the South Link Study The remainder of the Alternative 2 managed lanes corridor would be at-grade. Three typical cross sections were identified Alt # 2A: Three-lane cross section with reversible center lane to provide two lanes in the peak direction during the peak period, Alt # 2B: Four-lane cross section with two lanes each direction, Alt # 2C: Two-lane cross section (hybrid between Alternative 1 and 2), Alt #3: Four-lane fully elevated cross section of managed lanes with two lanes in each direction and no at-grade intersections. Four-lane fully elevated cross section of managed lanes with two lanes in each direction and no at-grade intersections. The three-lane or four-lane alternatives provide greater revenue but would need to be supplemented by alternative funding sources. Alt #3 provides significantly greater overall mobility benefits since the fully elevated alternative would remove at-grade intersections along the managed lanes. The advancement of managed lanes concept hinges upon the following key policy decisions like i) Funding mechanism, ii) Percent of revenue reserved for transit improvement, iii) Envelope for Metrorail extension.
15	South Link (South Miami-Dade Transit Corridor Study)	2006	Goals of the project: Improve i) corridor mobility, ii) citizens access to employment, iii) corridor safety and improve operating efficiencies, iv) Reduce auto dependency, v) Accommodate future growth by providing South Miami Dade citizens with high quality and cost effective transit service, vi) Modify development patterns in the corridor to support transit, vii) Develop plan for increment; increase in transit infrastructure. Tier-I (Qualitative) and Tier-II (Quantitative) analysis was performed. Tier-I analysis identified 7 alternatives out of which 3 alternatives (LRT, Metrorail to Florida City and BRT) were selected by CAC based on factors like reduction in travel time, increase in ridership and costs. Tier - II process was advanced with some refinements to the initial definition of the alternatives and also added Hybrid Metrorail to Florida City alternative to the Tier-I 3 selected alternatives. Key parameters such as Ridership, Traffic Impacts, Capital Cost, O&M Cost, Transit User Benefits & Cost Effectiveness, Cost-Effectiveness. After careful review and comparison of Tier-II alternatives with public, MPO's and CAC, a locally preferred alternative (LPA) was voted and selected. The LPA is a Modified Enhanced BRT with provisions of supporting a long-range Metrorail extension south of SW 104th St as demand warrants.

	Study Name	Year of Completion	Study Description
16	SW 152nd Street Corridor Transportation Study	2008	Purpose of the Study: Is to identify alternatives for improving traffic flow along SW 152nd Street (Approximately 7.5 miles in length) from SW162nd Avenue to SW 89th Ct (Just ease of US-1). The study identified short (2010) and mid-term (2015) mobility alternatives for improving traffic flow along the corridor and also longer term improvements beyond 2015 were also identifies for further study. Some of the short term improvements suggested in the study are Intersection improvements at SW 137th and SW 117th Ave, Access Management related improvements between 112th Abe and 107h Ave, Transit stop infrastructure improvements at major intersections, Enhancements to the P&R lot at 117th Ave. Mid-Term Improvements include: SW 152nd St widening, Express bus service on the HEFT to FIU, Capacity improvement projects along 162 and 157th Ave, Implementing Transportation Demand Management (TDM) strategies. Long-Term Improvements: SW 136th St connection to SR-874, BRT along the corridor from SW 137th/177th Ave to Dadeland South, Bicycle facilities along the corridor, Improve network connection to SW 177th ave, Address Land Use Transportation Nexus.
17	Tolled Highways with Rapid/Enhanced Bus Routes	2013	Two scenarios were considered in this study. Scenario A: Emerging Express Lane Network: Regional network of segregated median express lanes on existing expressway facilities. Scenario B: Express Roadway/Lane Hybrid Network: Based on a network of all-lane tolling with contiguous HOV lanes on most toll facilities and two Biscayne Bay crossings (MacArthur Causeway and Julia Tuttle Causeway) combined with segregated median express lanes on non-tolled expressway facilities. Scenario A was developed based on providing high speed one-seat ride connections between 15 existing or planned transit hubs, 18 express bus routes were developed from the 15 hubs. Scenario B: The proposed highway network for Scenario B was developed based primarily on providing an alternative to the toll-within-a-toll configuration associated with tolled roadways that create several constraints/challenges. Key factors such as Overall Systemwide and Managed/HOV Lane Performance, Auto Occupancy, Transit Network Ridership, Net Toll Revenues, Facility Capital and Operating Costs were analyzed using SERPM model results. After careful review of the benefits and challenges associated with 2 scenarios the study recommended a more detailed analysis of all-lane time-of-day tolling with HOV lanes and Managed Lanes on all future projects by agencies like MDX, FDOT, MDC.
18	Transit Service Evaluation Study	2011	Objectives of the Study: To analyze the impacts of the service December 2009 changes; develop an on-going monitoring program; and to develop standards for the installation, relocation and elimination of bus stops. Route and Corridor analysis (6 selected corridors: Biscayne, Flagler St, NE 2nd Ave, US-1 Busway, SR 7, NW 27th St) was conducted using APC data. For corridor level review several performance measures (Passenger/Trip, Passenger/Vehicle Miles, Passenger/Revenue hour, Fareboxratio, Ridesrship, Direct Operating Costs etc.,) were used to examine groups of routes within a corridor to identify any route overlap or any areas of potential ridership where service is not currently provided. Recommendations of Biscayne Corridor: Route 62 to be consolidated with those of Route 3 & 93. Recommendations of Flagler Corridor: Combine route 11 and 51 and implement BRT/EBS in the corridor. Recommendation of NE 2nd Ave Corridor: Combine route 9 and 10 and implement BRT/EBS. Recommendations of South Miami-Dade US-1 Busway Corridor: Develop a trunk-and-feeder service by truncating Routes 52, 252, and 287 before entering the Busway and improve headways on Routes 31 and 38 to accommodate the riders from these feeder routes. Recommendations SR 7 Corridor: Maintain existing service along the corridor. North Corridor/NW 27th St Corridor: Separate Route 27 at the Brownsville Metrorail Center into two parts and continue the existing Route 97 limited stop service. Long term plans for this corridor involve the construction of a Metrorail extension to the north portion of the County. Systemwide Recommendations: Service design improvemment (Implementing Trunck-and-Feeder System, Use of technology, Use of Jitney's, Private sector and Strategic visioning).

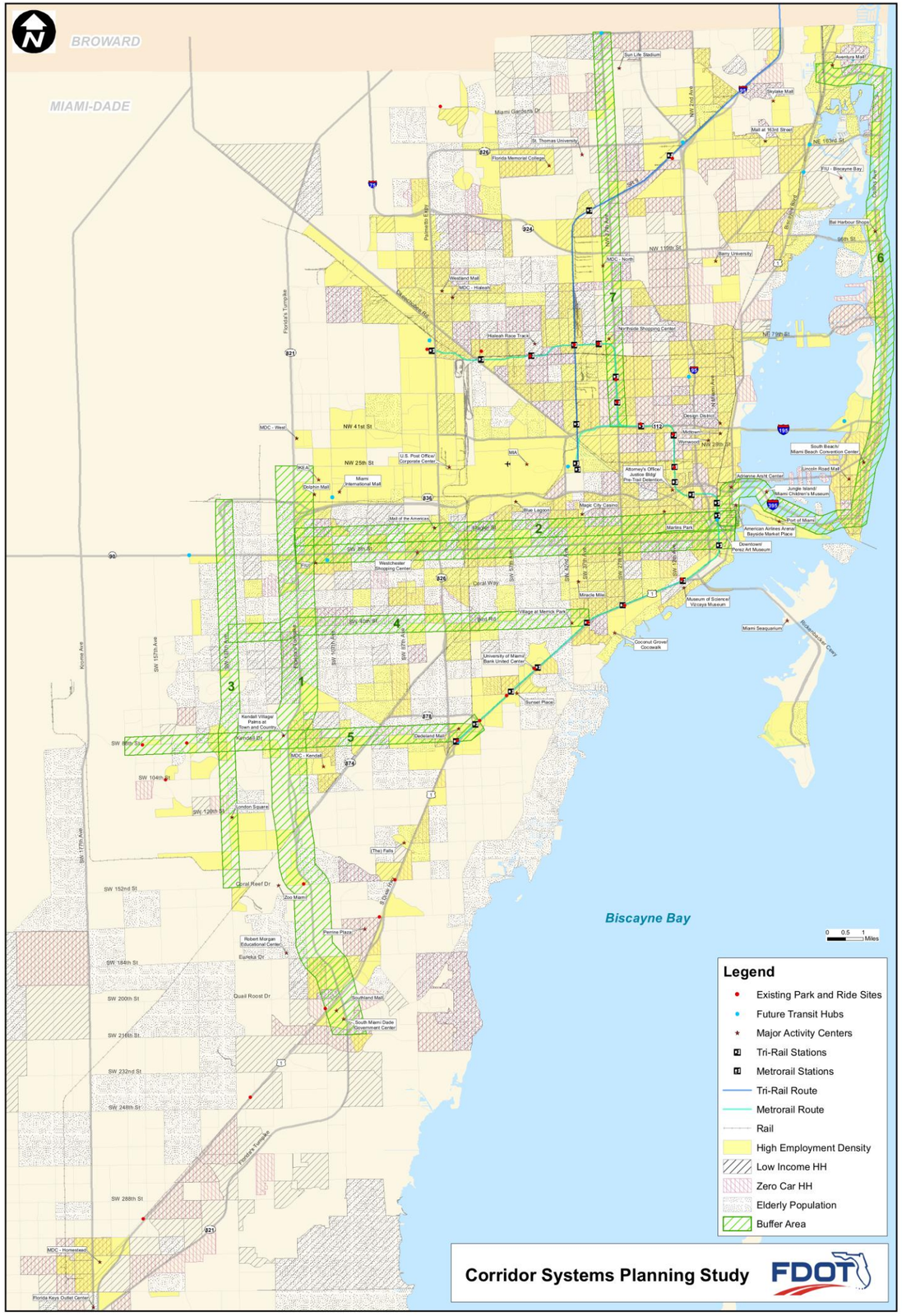
Appendix B

Maps of Proposed Alternatives

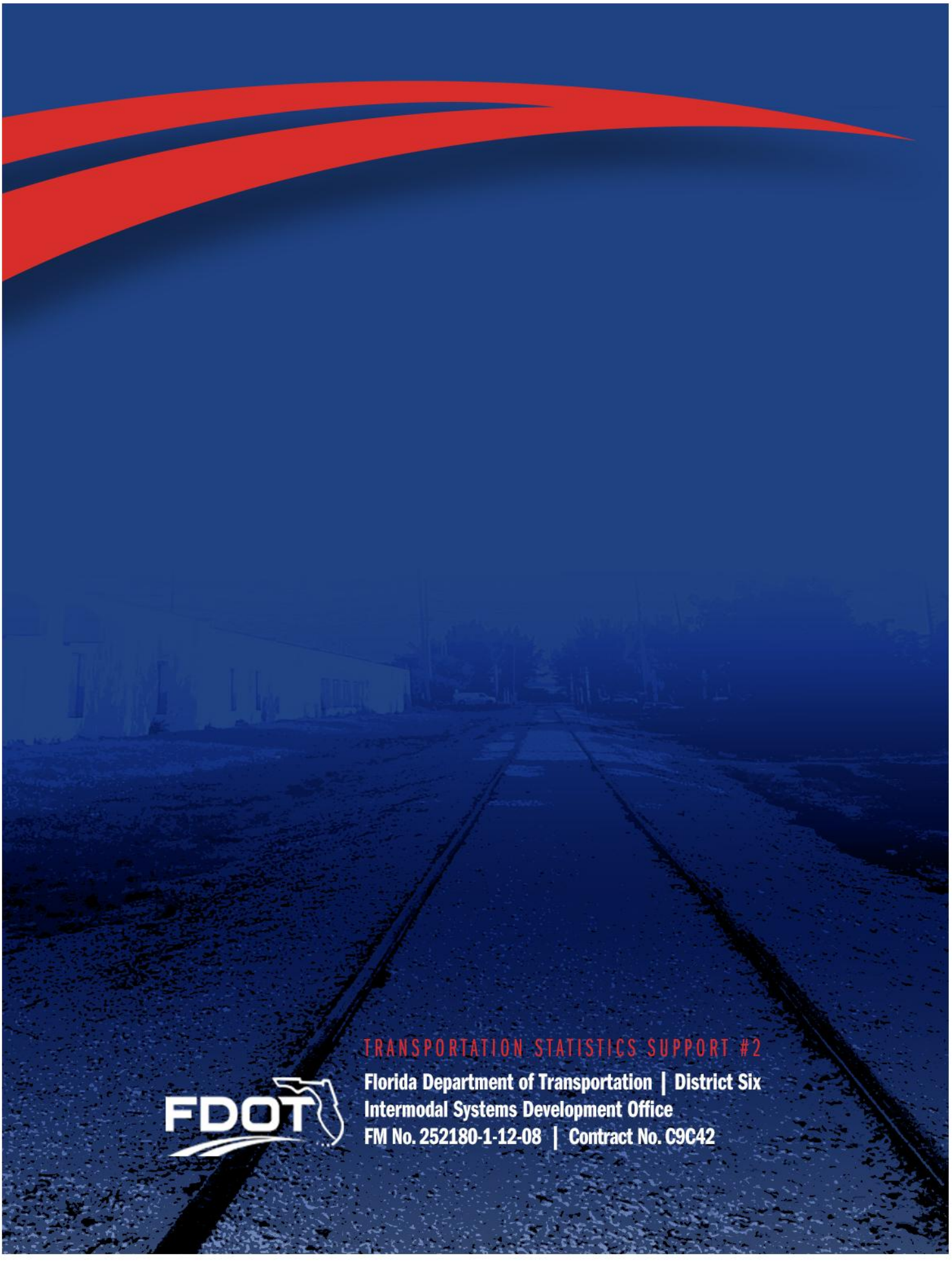
Population Density



Employment Density



Corridor Systems Planning Study FDOT


TRANSPORTATION STATISTICS SUPPORT #2
Florida Department of Transportation | District Six
Intermodal Systems Development Office
FM No. 252180-1-12-08 | Contract No. C9C42
FDOT