

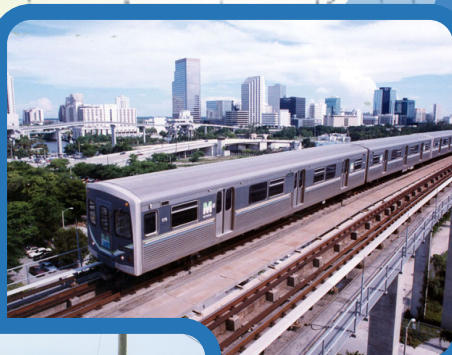
South Miami-Dade Corridor (South Link) Study Update

Prepared For:



MIAMI-DADE
METROPOLITAN
PLANNING
ORGANIZATION

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Prepared by



Gannett Fleming

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Prepared for:

Miami-Dade Metropolitan Planning Organization

111 NW 1st Street, Suite 920

Miami, FL 33128

Prepared by:

Gannett Fleming, Inc.

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TABLE OF CONTENTS

Study Purpose:	1
Background:	1
Projected Growth:.....	2
Traffic:	5
Transit Network:	6
Alternatives:.....	7
Transit Ridership:	15
Cost for Alternatives:	15
Capital Costs	15
Operating and Maintenance Costs (O&M)	16
Cost-Benefit Analysis of Alternatives:.....	18
Recommendations:	22
Planned Projects in the Study Area:	22
TDP	22
TIP	22
LRTP	23
Policy Decisions:.....	24
Project Phasing:	24

FIGURES

1 – Study Area Segments	3
2 – SERPM 7 Model Networks – Corridor Segment TAZs	4
3 – Alternative 1 – No Build	10
4 – Alternative 2 – TSM/Baseline.....	11
5 – Alternative 3 – Light Rail Transit	12
6 – Alternative 5 – Metrorail to Florida City	13
7 – Alternative 6 – Metrorail/BRT	14

TABLES

1 – Comparison of 2030 and 2040 SE data for South Link Corridor and Miami-Dade County.....	2
2 – Growth by Segment	5
3 – Average Annual Daily Traffic (AADT) Growth	6
4 – Systemwide Transit Ridership Forecast	15
5 – Capital Costs (millions)	16
6 – O&M Costs for Tier II Alternatives (millions)	18
7 – Tier I Evaluation Matrix	18
8 – User Benefits of Tier II Alternatives	19
9 – Cost per New Rider of Tier II Alternatives.....	20
10 – Tier II Evaluation Matrix.....	21

APPENDIX – TIER 1 ALTERNATIVES

Study Purpose:

The South Miami-Dade Corridor Alternative Analysis (South Link) Study, completed in June 2006, identified potential transit improvements along the US 1 (South Dixie Highway/Busway Corridor) i.e. South Corridor. This study, referred to as the 2006 South Link Study in this report, was conducted by the Miami-Dade Metropolitan Planning Organization (MPO) to address the lack of north-south mobility, failing levels of service, high projected growth, and the imbalance of jobs and housing in the area. The 2006 South Link Study was part of the post People's Transportation Plan (PTP) passage attempt to identify future premium transit improvements beyond the existing and planned improvements for the Busway. The South Link Study recommended, and supported by the Miami-Dade MPO Board, the Modified Enhanced Bus Rapid Transit (BRT) Alternative 6 including an Enhanced BRT system from SW 104th Street south to Florida City within the existing and future (at the time) South Miami-Dade Busway right-of-way and a Metrorail extension from the Dadeland South Metrorail Station to SW 104th Street with a possible future extension as demand warrants.

The 2006 South Link Study evaluated alternatives in two tiers. The alternatives in Tier I were identified by the public with input from the technical committee and evaluated based on the transportation needs of the corridor and the goals and objectives of the study. The Tier I analysis was more of a qualitative analysis based on available and limited data. The Tier II analysis was a more quantitative analysis with refined alternatives with more detailed information on the alternative systems and more detailed estimates.

This update, also conducted by the Miami-Dade MPO, provides a cursory review of selected portions of that study and provides updated information, as applicable. Potential environmental effects were not reviewed or analyzed during this update.

Background:

The Miami-Dade Busway is a 19.8 mile two lane dedicated bus corridor that provides local and limited stop bus service between Florida City (SW 344th Street) and Dadeland South Metrorail Station. The Busway is open to transit buses and emergency vehicles. The Busway has 30 stations including 29 Busway stations and a Metrorail station and intersects 45 cross streets. The two 12 foot lanes are separated by a four foot flush median buffer with eight foot shoulders. The speed limit is 45 miles per hour though buses are required to go 15 miles per hour or less to cross all intersections. There are currently six park-and-ride lots located along the Busway at the following locations:

- SW 152nd Street – Corral Reef Drive
- SW 168th Street
- SW 112th Avenue
- SW 244th Street
- SW 296th Street
- SW 344th Street – West Palm Drive, Florida City – recently opened in June 2015

The Busway opened in February 1997. The initial phase was 8.3 miles serving Dadeland South to the Cutler Ridge area at SW 122nd Avenue. In April 2005, the Busway was extend five miles from SW 112th Avenue to SW 264th Street. The 2006 South Link Study was conducted during this time. The final phase opened in December 2007, a 6.5 mile extension from SW 264th Street to SW 344th Street in Florida City.

The Busway runs parallel and within a half a mile to US 1/South Dixie Highway, a heavily congested north-south corridor along the eastern part of Miami-Dade County connecting the southern part of the county (Florida City) to Downtown Miami and north. There are a limited number of other north-south facilities that traverse the entire southern part of the county which include: the Homestead Extension of the Florida Turnpike (HEFT) in eastern Miami-Dade County and Krome Avenue along the western urban boundary.

Projected Growth:

The 2006 South Link Study projected high socioeconomic (SE) growth rates for the future year 2030 in the corridor for housing, workers, and employment, based on the 2000 Census. Though south Miami-Dade County is one of the fastest growing areas in the county, the effects of the economic downturn in the late 2000s slowed these growth rates. The updated projected SE data, based on the 2010 Census and for the future year 2040, still shows substantial projected growth but not at the same rates as in the 2006 South Link Study.

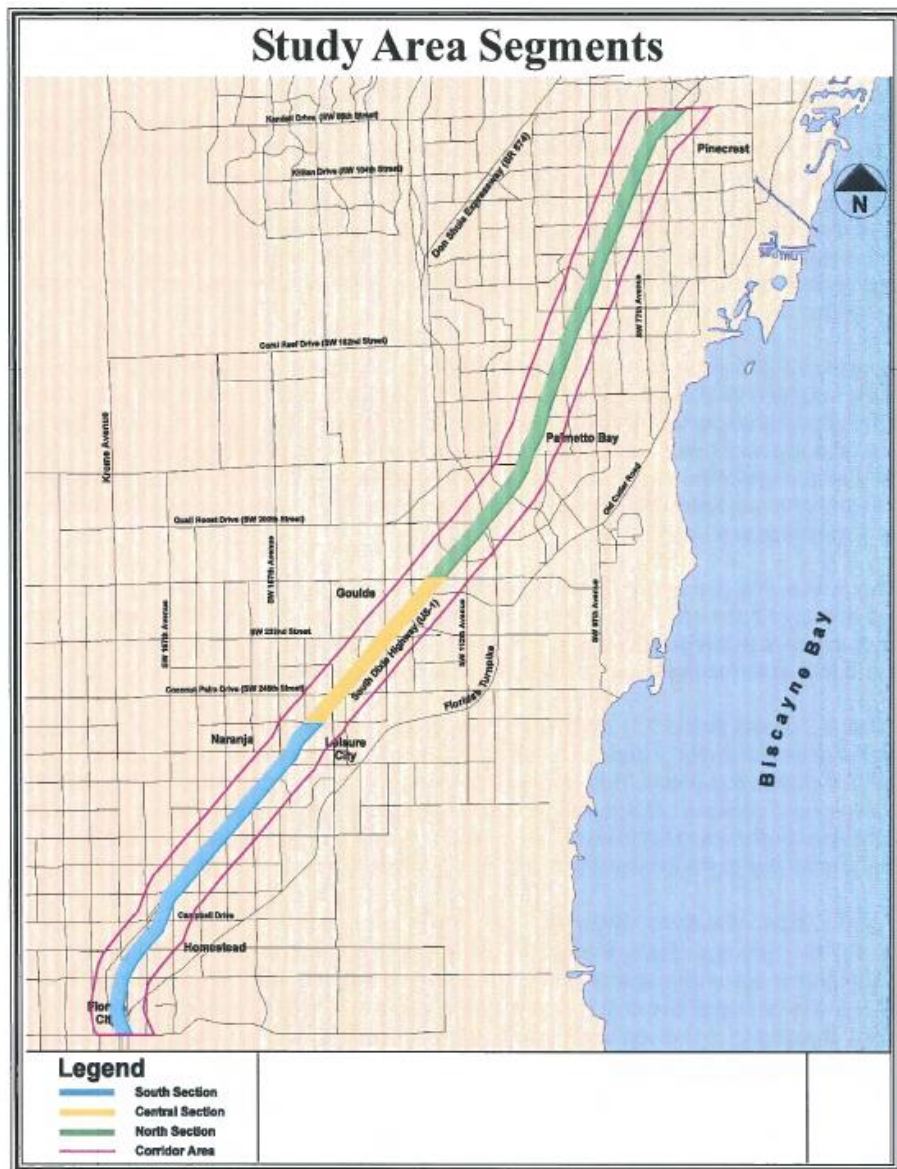
To analyze and update the SE data, a comparison of the 2030 and 2040 forecasts was conducted to understand the differences in the two SE data forecasts. To facilitate the comparison, a traffic analysis zone (TAZ) equivalent of three general areas in Miami-Dade was made to compare the 2000 and 2030 SE data conditions to the latest SERPM 7, 2010 base year and 2040 forecast conditions. In the 2006 South Link Study, a two-mile wide buffer was used around the US 1/Busway corridor to summarize the SE data for 2030. A similar buffer for this update was developed to compare the 2030 and 2040 SE datasets for the Corridor. Using this new equivalency for 2030 and 2040, a summary of the SE data conditions are presented in **Table 1** below contrasting a few major variables within the study corridor (buffer area) – Corridor, the rest of South Miami-Dade County – South County Portion, South Miami-Dade County – South County, the rest of Miami-Dade County – Rest of County, and the county as a whole – Miami-Dade Totals.

TABLE 1 – Comparison of 2030 and 2040 SE data for South Link Corridor and Miami-Dade County

Study Area	2030 HH	2040 HH	2040-2030 % HH Diff	2030 POP	2040 POP	2040-2030 % POP Diff	2030 EMP	2040 EMP	2040-2030 % EMP Diff
Corridor	81,885	86,068	5%	255,881	261,336	2%	101,425	128,349	27%
South County Portion	165,402	137,645	-17%	511,003	466,700	-9%	103,308	148,310	44%
South County	247,287	223,713	-10%	766,884	728,036	-5%	204,733	276,659	35%
Rest of County	837,603	933,089	11%	2,382,407	2,374,102	0%	1,385,504	1,328,898	-4%
Miami-Dade Totals	1,084,890	1,156,802	7%	3,149,291	3,102,138	-1%	1,590,237	1,605,557	1%

Table 1 shows a 5% increase of households (HH) in the 2040 forecast over the 2030 forecast, 2% more population (POP), and 27% more employment (EMP) in the Study Area corridor. However, South County as whole, which includes the 2040 Corridor increases, shows a decline in households of 10% and a relative decline of population of 5% in the 2040 forecast from the 2030 forecast. The 2040 Employment forecasts for the entire South County area does show a strong increase of 35% over the 2030 forecast. The 2040 forecast for the rest of the county to the north shows an 11% increase in households, a slight decrease in population, and a 4% decrease in employment over the 2030 forecast. The differences between the two forecasts are mixed with increases and decreases in the various areas without a definite trend overall. The corridor was evaluated as three subsections to illustrate the change in density of the Population Growth along the corridor, as shown in **Figure 1 – Study Area Segments**, from the 2006 South Link Study.

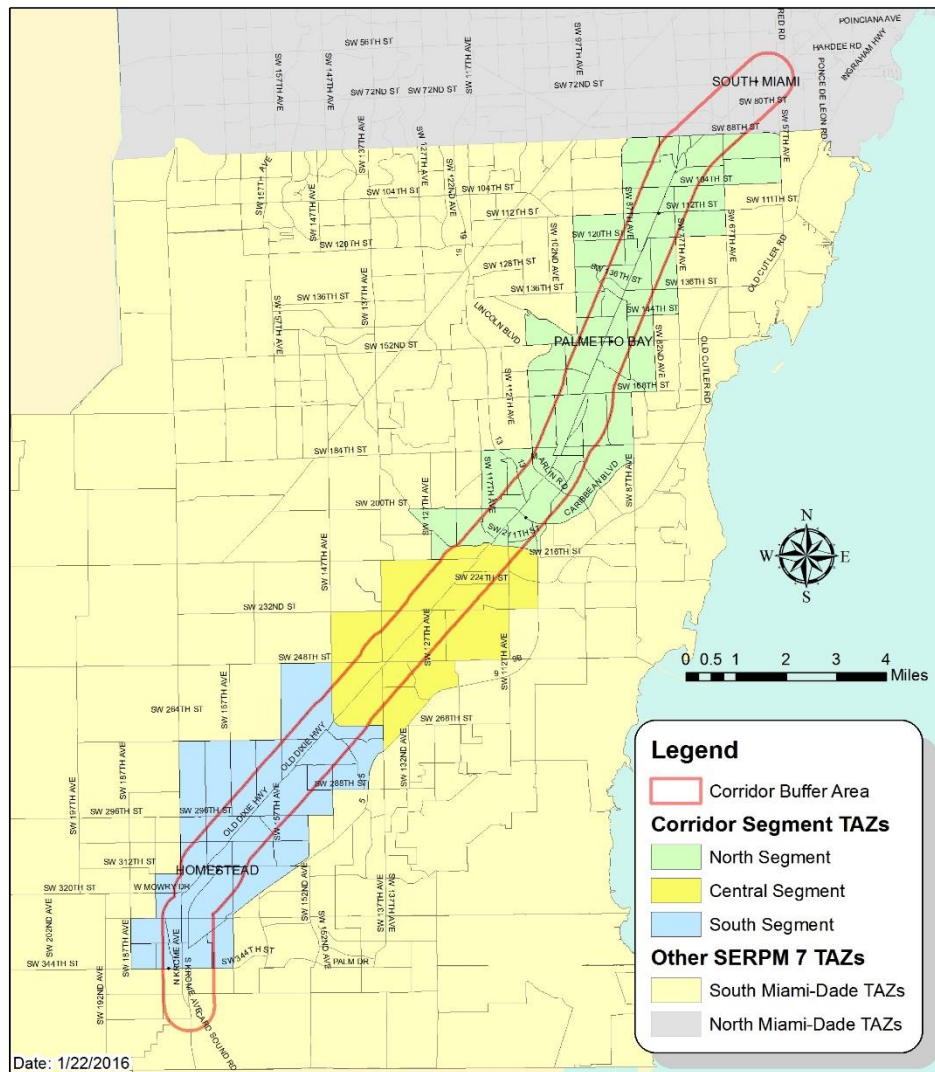
FIGURE 1



Source: South Miami-Dade Corridor Alternative Analysis Report (South Link Study), June 2006, The Corradino Group, Inc., page 5.

The following map represents the equivalent TAZ combinations by segment used for this update to compare the population growth at the segment level using the SERPM 6 and SERPM 7 SE datasets.

FIGURE 2 – SERPM 7 Model Networks – Corridor Segment TAZs



As shown on the map, the two-mile wide buffer splits many of the TAZs used for the comparison. Comparison calculations were performed for the area inside and outside of the buffer assuming homogeneity across the TAZ to get the closest match to the 2006 Study by Segment. For the final comparisons, data for the entire TAZ was used to match the 2006 Study. The results of this evaluation of the data from the SERPM 7 are presented in the following **Table 2 – Growth by Segment** and contrasted with the 2006 Study Results.

TABLE 2 – Growth by Segment

Segments	North Segment			Central Segment			South Segment			Total Corridor		
	Report	SERPIM 7	% Diff	Report	SERPIM 7	% Diff	Report	SERPIM 7	% Diff	Report	SERPIM 7	% Diff
	2000	2010		2000	2010		2000	2010		2000	2010	
Base Population	57,490	82,448	43%	38,089	29,957	-21%	47,830	54,760	14%	143,409	167,165	17%
Population/Sq. Mile	5,581	4,142	-26%	9,522	2,983	-69%	8,696	3,908	-55%	7,242	3,803	-47%
Population/Acre	8.7	6.5	-25%	14.9	4.7	-68%	13.5	6.1	-55%	11.3	5.9	-47%
	2030	2040		2030	2040		2030	2040		2030	2040	
Projected Population	83,613	97,760	17%	68,132	70,314	3%	85,492	93,262	9%	237,237	261,336	10%
% Growth	45.5%	19%	-59%	78.8%	134.4%	71%	79%	70%	-11%	65.4%	56.3%	-14%
Population/Sq. Mile	8,117	4,912	-39%	17,033	7,002	-59%	15,544	6,656	-57%	11,981	5,945	-50%
Population/Acre	12.7	7.7	-39%	26.6	10.9	-59%	24.3	10.4	-57%	18.7	9.3	-50%

*Note areas analyzed may not be exactly the same as the 2006 South Link Study

This comparison shows that it was difficult to replicate the 2006 Study's results exactly due to differences in the TAZ configurations and combinations used for the corridor segmentation. However, the trend of the forecasts shows that although there is a slightly higher population density in the Northern Segment in the current years, a higher population density is expected in the Central and Southern segments than that of the Northern segment in the future.

Traffic:

The traffic congestion and constrained conditions in the US 1/Busway corridor are known facts and well documented in previous studies. Based on 2010 conditions, most of US 1 from Dadeland South to SW 248th Street operates at level of service (LOS) F with few short segments with a range of better LOSs. By 2040, LOS on US 1 will continue to decline south to Florida City and have fewer segments of improved LOS. In summary:

- US 1 is four (4) lanes between SW 344th and SW 244th Streets and six (6) lanes from SW 244th Street to Dadeland South
- US 1 is heavily congested, traffic volumes continue to increase from south to north
- US 1 is constrained and has reached its limits for widening
- There are a limited number of north-south facilities in southern Miami-Dade County
 - HEFT is a four (4) lane limited access toll facility that extends all the way across South Miami-Dade County and is planned to be widened based on the latest 2040 LRTP. Express Lanes are currently being constructed from SW 288th Street/Biscayne Drive north to SR 836.
 - Krome Avenue at the time of the 2006 study was a two-lane rural facility along the western edge of the Urbanized Boundary. Krome Avenue is currently under construction to be widened to 4 lanes.

The 2006 South Link Study documented the growth along US 1 by comparing the Average Annual Daily Traffic (AADT) between 1994 and 2003 near major intersections. These values are compared to the most recent 2014 AADT near the same intersections in **Table 3 – Average Annual Daily Traffic (AADT) Growth**. Based on this data, the traffic volumes continue to grow through the central and northern segments of the corridor and remains about the same in the most southern segment of the corridor.

TABLE 3 – Average Annual Daily Traffic (AADT) Growth

US 1 Intersection	1994 AADT	2003 AADT	% Growth 1994-2003	2014 AADT	% Growth 2003-2014
SR 826	90,000	94,000	4.44%	99,500	5.85%
SW 152 nd St	61,000	74,000	21.31%	76,500	3.38%
SW 288 th St	28,000	32,500	16.07%	*38,500	18.46%
SW 328 th St	11,800	30,000	154.24%	29,500	-1.67%

*268th Street values were used

Transit Network:

Most of the same Metrobus Routes currently operate on the Busway as they did in 2006, except for Route 65 which was deleted. A summary of the bus routes that currently operate on the Busway are as follows:

- Route 1 – Serves Perrine Shopping Center, Southland Mall, and Quail Roost Drive/SW 117th Avenue and operates on the Busway for a short segment between SW 172nd Street and SW 168th Street. Northbound and southbound headways are 40 minutes throughout the day, 6:35 AM to 7:43 PM.
- Route 31 – Busway Local – Serves South Dade Government Center, Southland Mall, The Falls, and Dadeland South Metrorail Station. Northbound and southbound headways vary from 11 minutes to 30 minutes and the route operates from 4:49 AM to 8:55 PM.
- Route 34 – Busway Flyer – Provides weekday express limited stop service on the Busway between Florida City and Dadeland South Metrorail Station. Northbound service operates between 4:56 AM and 9:05 PM and southbound service operates between 3:46 PM and 7:50 PM. Both northbound and southbound headways are between 7 and 15 minutes.
- Route 35 – Serves Homestead High School to Miami-Dade College (MDC) Kendal Campus along a varied route that uses the Busway in the Goulds and Cutler Bay areas to MDC Kendal Campus. Northbound and southbound headways vary and the route operates between 5:07 AM to 12:30 AM.
- Route 38 – Busway Max – Provides service from Florida City (Walmart) to Dadeland South Metrorail Station along the Busway and serves Southland Mall. Northbound and southbound headways range from 7 to 15 minutes during the AM and PM peak periods. This route operates 24 hours a day.
- Route 52 – Serves Community Health of South Dade, Southland Mall/South Dade Government Center, and Dadeland South Metrorail Station along a varied route that includes the northern portion of the Busway from SW 144th Street north. Northbound and southbound headways range from 26 to 45 minutes during the AM and PM peak periods and the route operates 4:33 AM and 11:55 PM.
- Route 136 – Provides weekday rush-hour service only between SW 112th Street and SW 147th Avenue and Douglas Metrorail Station. This route uses the Busway from SW 104th Street north to Dadeland South Metrorail Station.
- Route 252 – Coral Reef Max – Serves County Walk and Zoo Miami along Coral Reef Drive to the Busway and north to Dadeland South Metrorail Station. Eastbound and westbound headways vary and the route operates between 5:31 AM and 9:03 PM.

- Route 287 – Saga Bay Max – Provides weekday rush-hour service only between South Dade Health Center and Dadeland South Metrorail Station. This route enters the Busway at SW 168th Street and continues north to Dadeland South Metrorail Station. Both Northbound and southbound headways are approximately 30 minutes.

Alternatives:

The alternatives in the 2006 South Link Study were developed and analyzed in two tiers. The same alternatives were reviewed and reevaluated for this study based on updated socioeconomic data, traffic, and costs. Brief descriptions of the alternatives for both tiers are described below. The description of these alternatives (except for the No Build in Tier I) are taken directly from the 2016 South Link Study, done by The Corradino Group. More detailed descriptions may be found in the 2006 South Link Study report.

The Tier 1 Alternatives were identified as follows:

Alternative 1: No Build Alternative

The No Build Alternative included the completion of the South Miami Busway to SW 344th Street in Florida City. At the time of the 2006 South Link Study, the last 6.5 miles of the Busway was not yet complete and open for operations. This alternative consists of existing plus planned and programmed projects including the addition of several park-and-ride lots, implementation of community circulators, and of 15 minute peak headways on most routes.

Alternative 2: Transportation Systems Management (TSM)

This alternative would include modification of the existing bus service in the southern half of Miami-Dade County. Under the Transportation System Management (TSM) alternative, fixed-route service would continue to feed the existing Dadeland South Metrorail station from Florida City. The TSM alternative would provide substantially more park-and-ride facilities. Signal prioritization would be an essential modification to the Busway to improve transit travel time on the Busway.

Alternative 3: Light Rail Transit (LRT) to Florida City

This alternative would provide light rail transit (LRT) service from SW 104th Street to Florida City. It includes a one-mile extension of Metrorail from Dadeland South to the vicinity of SW 104th Street on the existing Busway. This alternative consists of approximately 19.5 miles of a light rail facility powered by a catenary with tracks within the original Busway right-of-way. The LRT service would be at-grade and a transfer would still be required at the SW 104th Street station. Stations spacing would be identical to the stops on the Busway, approximately at 1/2 mile intervals with easy access for bus riders, pedestrians, and passengers at stations.

Alternative 4: Metro Rail to Southland Mall/Bus Rapid Transit (BRT) from Dadeland South to Florida City

This heavy rail alternative would provide rapid transit service between the existing Dadeland South Metrorail station and the Southland Mall/South Dade Government Center area. The bus service improvements proposed for the TSM alternative would provide transit service improvements in the remainder of the corridor to Florida City. This alternative would be an eight-mile extension of Miami-Dade Transit's elevated, heavy rail system. The Metrorail vehicles and guideway would be similar to existing services in Miami and operate on an exclusive, elevated guideway. The Busway portion would extend from the proposed Metrorail station in the vicinity of the Southland Mall to Florida City, approximately 11 miles. The Busway would operate on an exclusive, at-grade guideway.

Alternative 5: Metrorail to Florida City

This alternative would provide heavy rail rapid transit service from the existing Dadeland South Metrorail station to Florida City. This alternative would extend Miami-Dade County's elevated rapid transit system an additional 19 miles. The Metrorail vehicles and guideway would be similar to existing services in Miami.

Alternative 6: Metrorail to SW 104th Street/BRT from Dadeland South to Florida City

This alternative would include the construction of a new one-mile extension of Metrorail to the vicinity of SW 104th Street on the existing Busway. South of SW 104th Street, Alternative 6 proposes that the existing Busway be converted to a bus rapid transit (BRT) corridor. BRT service would run from SW 104th Street in the north to Florida City in the south, and include grade separation for the BRT corridor at several critical roadway crossings to enhance overall system safety, and to achieve greater travel time and trip reliability benefits for BRT users.

Alternative 7: Diesel Multiple Unit (DMU) on CSX/Kendall Drive and Maintain Operation on Existing Busway

The DMU Alternative for the South Link Corridor consists of diesel multiple unit (DMU) commuter rail service in the CSX corridor between Florida City and Dadeland, combined with the TSM alternative on the Busway. The DMU technology is a general term for a diesel-powered train in which the propulsion and control systems are contained within each vehicle. DMUs can have control cabs at both ends of the vehicle, which simplifies out-and-back, point to point operations. DMUs can also pull up to two standard commuter coaches for increased capacity.¹

A map of each tiered alternative from the 2006 South Link Study can be found in the appendix.

Based on the 2006 South Link Study, the two low cost alternatives and three build alternatives, as recommended by the CAC, from Tier I were brought forward to the Tier II analysis. Alternative 4 Metrorail to Southland Mall/Bus Rapid Transit (BRT) from Dadeland South to Florida City and Alternative 7 Diesel Multiple Unit (DMU) on CSX/Kendall Drive and Maintain Operation on Existing Busway were eliminated. The alternatives that advanced to Tier II were refined. In addition, a new alternative, Alternative 5A Hybrid, was added as a less expensive alternative to Metrorail. Brief descriptions of the Tier II alternatives from the 2006 South Link Study are as follows:

- **Alternative 1 No Build**

"The No-Build Alternative is required for analysis by the federal government and its purpose is to examine what would happen in the corridor if no new projects were constructed. In addition, the No-Build Alternative is used as the baseline alternative for evaluating the impacts of the Tier II build alternatives."² See **Figure 3**.

- **Alternative 2 Transportation System Management (TSM)**

"The Transportation System Management (TSM) Alternative includes projects in the corridor that would be relatively easy to implement and these projects include modification of local bus routes to better feed the

¹ Source: *South Miami-Dade Corridor Alternative Analysis Report (South Link Study)*, June 2006, The Corradino Group, Inc., page ES-7, ES-13.

² Source: *South Miami-Dade Corridor Alternative Analysis Report (South Link Study)*, June 2006, The Corradino Group, Inc., page 97.

Busway, construction of additional park-and-ride facilities, and provision of bus priority signalization along the corridor.”³ See **Figure 4**.

- **Alternative 3 Light Rail Transit (LRT)**

“The Light Rail Transit (LRT) Alternative would provide light rail transit service from the Dadeland South Metrorail terminus to Florida City. The LRT service would operate at ground level along the existing Busway right-of-way.”⁴ In Tier II, Alternative 3 (LRT) does not include a Metrorail extension to SW 104th Street. See **Figure 5**.

- **Alternative 5 Metrorail**

“The Metrorail Alternative would provide elevated guideway rapid transit service from the existing Dadeland South Metrorail station to Florida City. The Metrorail tracks and stations would be within the existing Busway right-of-way.”⁵ See **Figure 6**.

- **Alternative 5 A Hybrid**

“The Dual Mode Metrorail Alternative would utilize a hybrid Metrorail that could draw power from two different sources. The Metrorail vehicles would operate along the existing Metrorail system drawing power from the electrified third rail. In addition, these vehicles would be retrofitted to draw power from an overhead power line, enabling the vehicle to operate at ground level from the Dadeland South Metrorail station to Florida City along the existing Busway right-of-way.”⁶

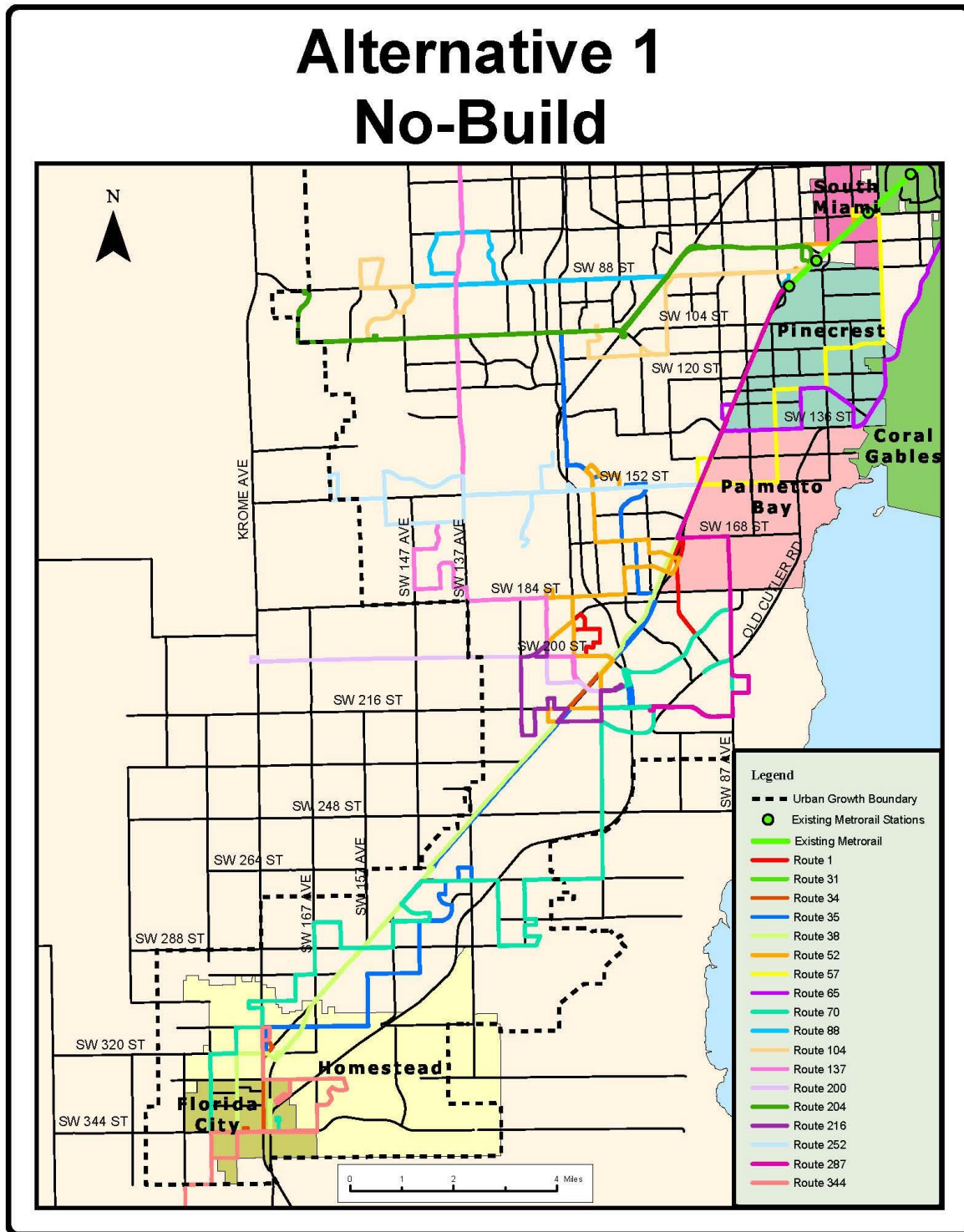
- **Alternative 6 Enhanced Bus Rapid Transit (BRT)**

“The Bus Rapid Transit (BRT) Alternative would provide bus rapid transit service from Dadeland South to Florida City along the existing Busway right-of-way. This alternative would also provide flexibility for buses to leave the Busway and provide direct service to local neighborhoods.”⁷ See **Figure 7**.

^{3, 4, 5} Source: *South Miami-Dade Corridor Alternative Analysis Report (South Link Study)*, June 2006, The Corradino Group, Inc., page 97.

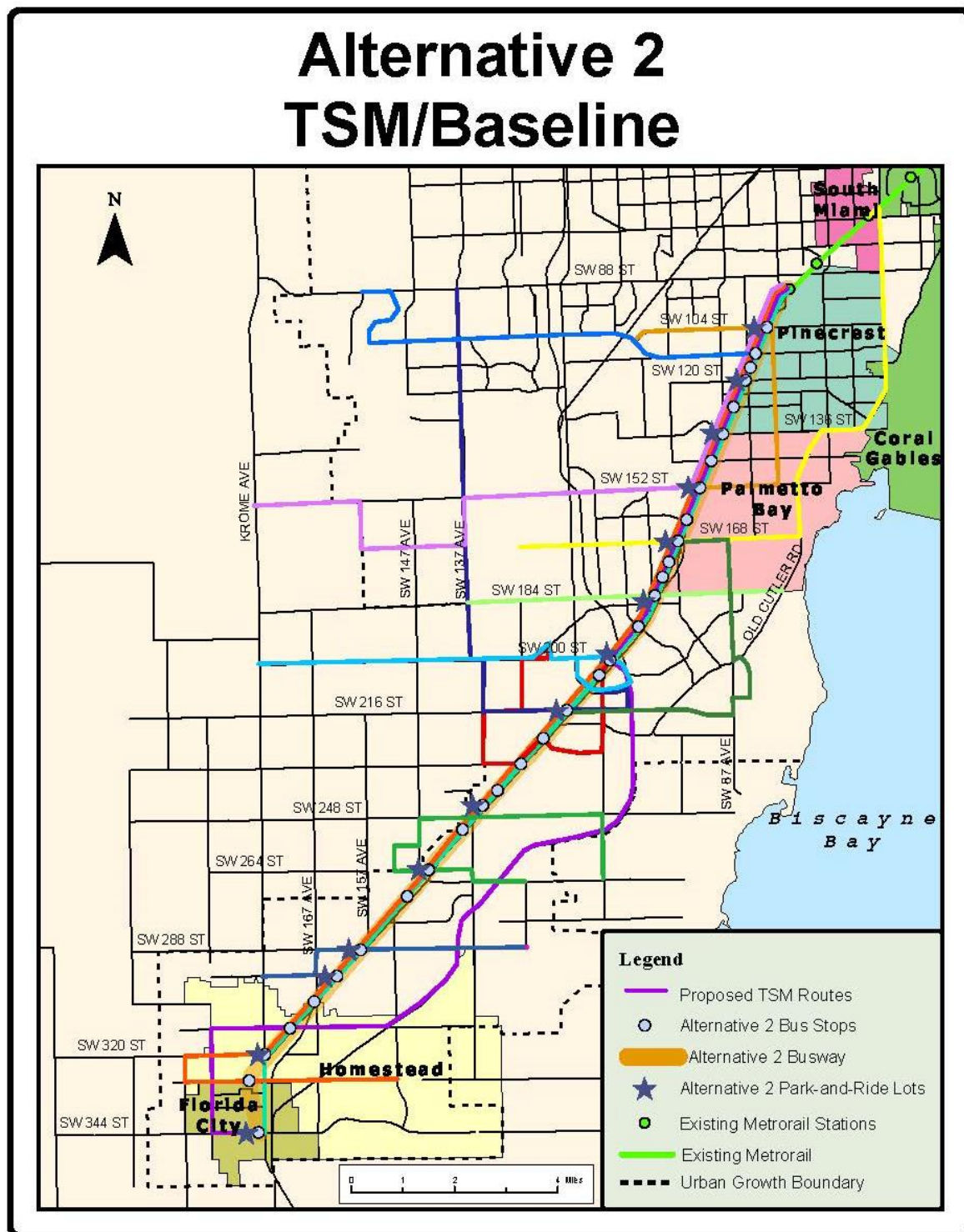
^{6, 7} Source: *South Miami-Dade Corridor Alternative Analysis Report (South Link Study)*, June 2006, The Corradino Group, Inc., page 98.

FIGURE 3



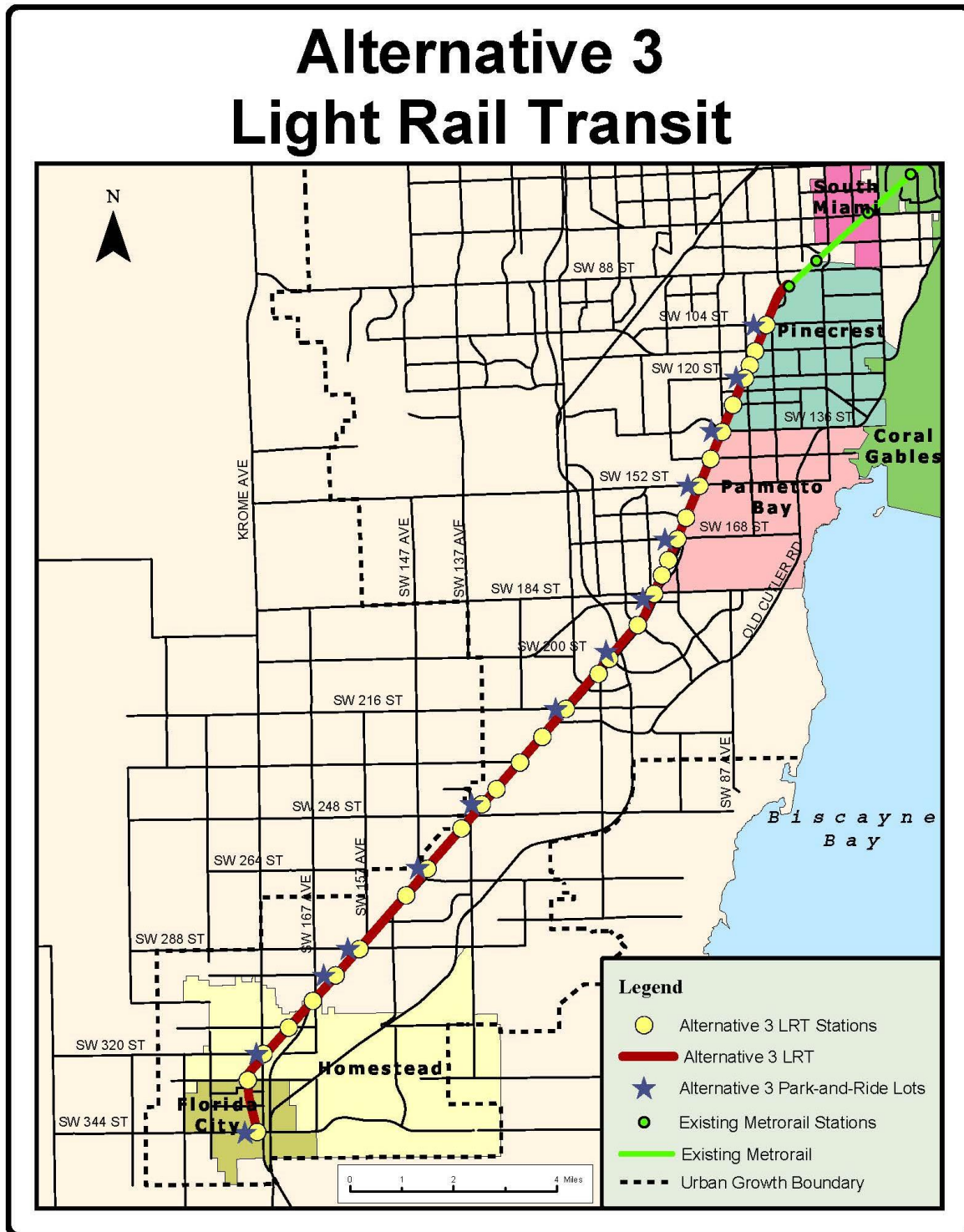
Source: South Miami-Dade Corridor Alternative Analysis Report (South Link Study), June 2006, The Corradino Group, Inc., page 99.

FIGURE 4



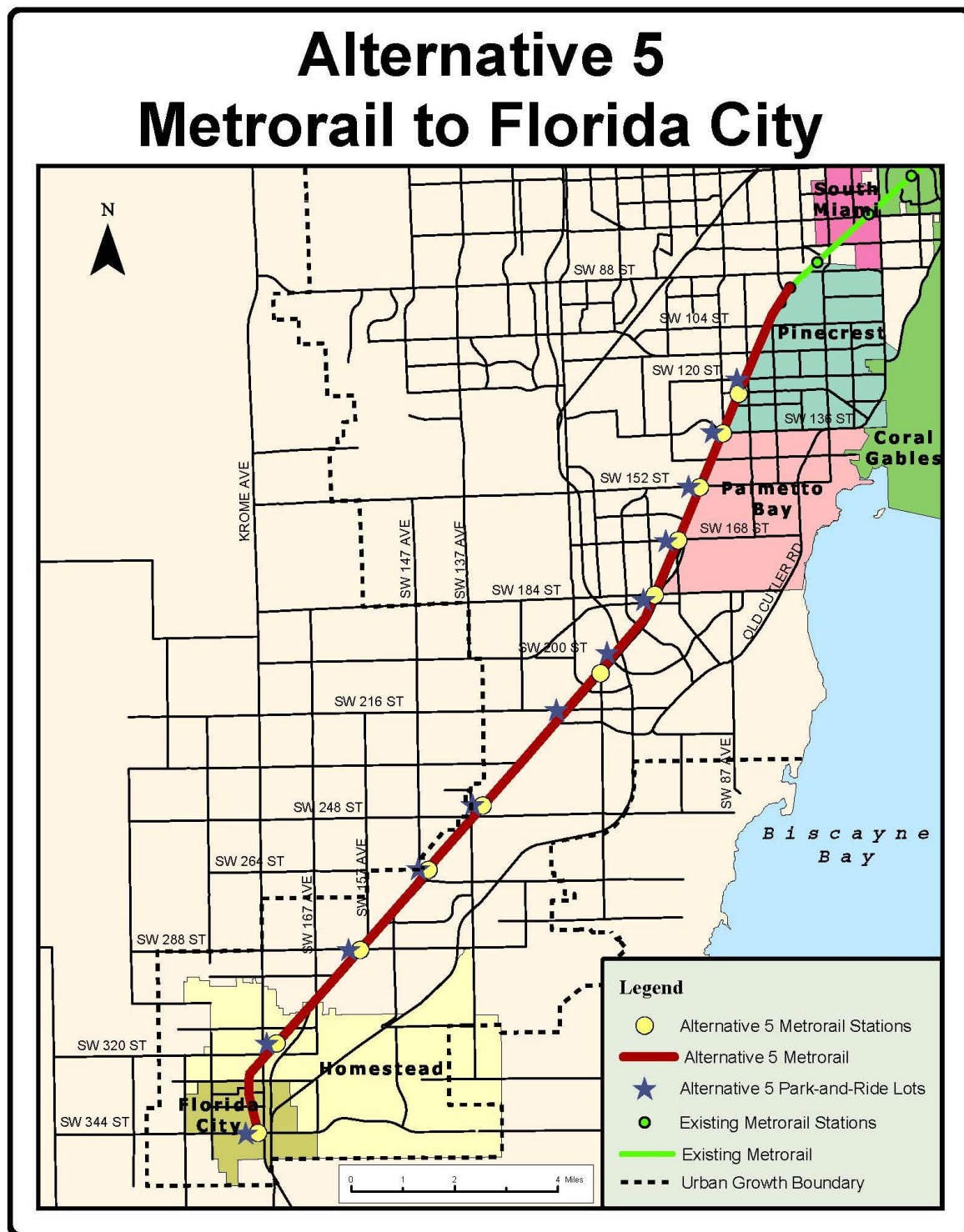
Source: South Miami-Dade Corridor Alternative Analysis Report (South Link Study), June 2006, The Corradino Group, Inc., page 104.

FIGURE 5



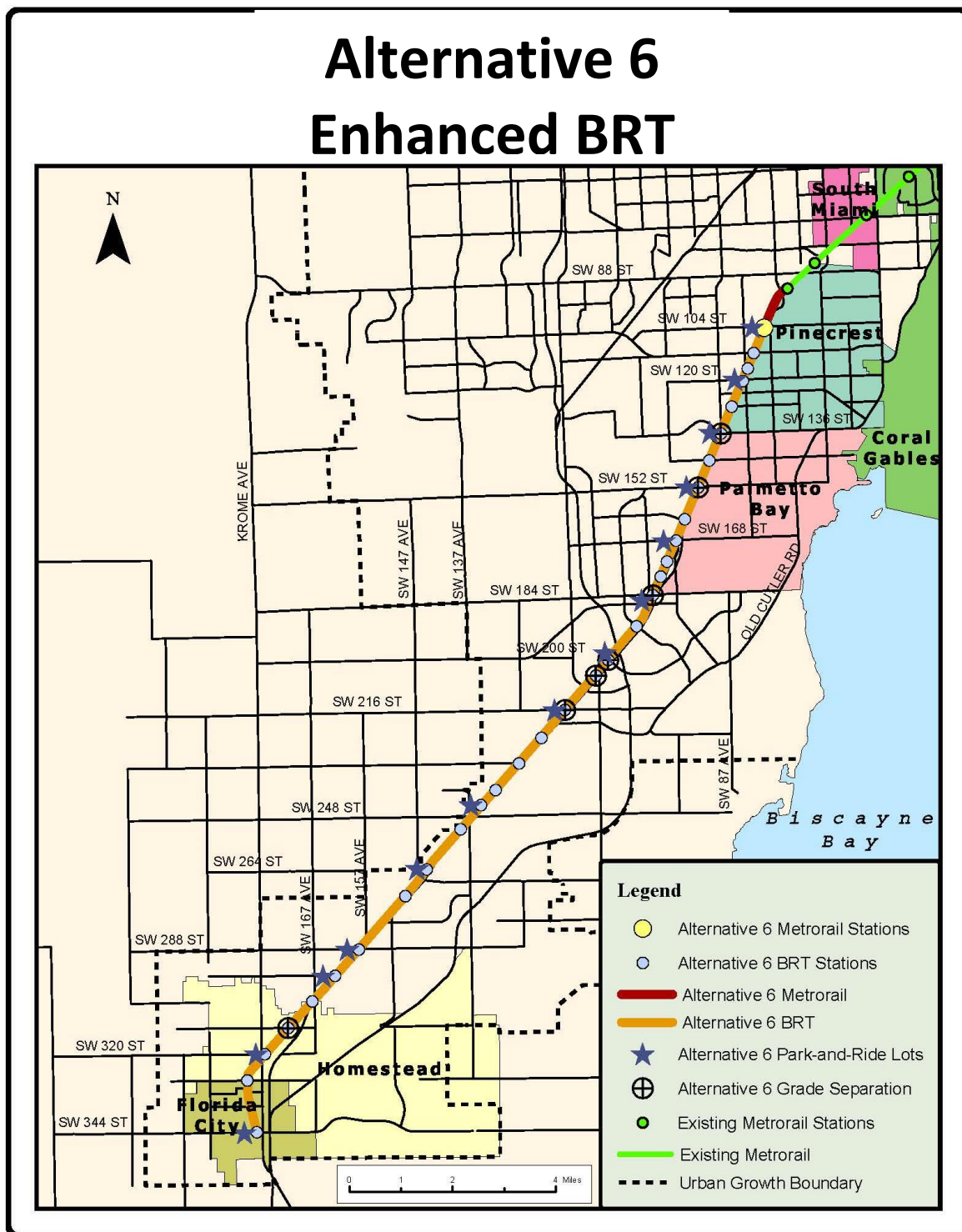
Source: South Miami-Dade Corridor Alternative Analysis Report (South Link Study), June 2006, The Corradino Group, Inc., page 108.

FIGURE 6



Source: South Miami-Dade Corridor Alternative Analysis Report (South Link Study), June 2006, The Corradino Group, Inc., page 117.

FIGURE 7



Source: South Miami-Dade Corridor Alternative Analysis Report (South Link Study), June 2006, The Corradino Group, Inc., page 132.

Transit Ridership:

The South Link Study performed in 2006 used the latest South East Regional Planning Model (SERPM) version 6 that was available at the time. This model was based on Year 2000 conditions, networks, and socioeconomic (SE) data, with a future forecast year of 2030. The model forecasts produced transit ridership for each of the Study alternatives which included a reduction of the background bus transit in most cases from the “No-Build” and Transportation Systems Management (TSM) baselines.

The transit ridership update is based on the ridership results by alternative from the 2006 South Link Study. Factors were applied based on the differences of the 2040 and 2030 socioeconomic datasets considering the increases or decreases of households and employment across the Miami-Dade area. Special consideration was given to the ridership along the alternatives based on the growth changes that were present in the socioeconomic data in the corridor area. **Table 4** –Systemwide Transit Ridership Forecasts table outlines the total transit trips and boardings derived from the 2006 study and the updated transit ridership forecasts.

TABLE 4 – Systemwide Transit Ridership Forecast

Alternative	Total Transit Trips		Total Transit Boardings		%Change in Transit Trips Over TSM		%Change in Transit Boardings Over TSM	
	2030	2040	2030	2040	2030	2040	2030	2040
Alt 1. No Build	303,360	315,000	603,707	627,000				
Alt 2. TSM	304,720	316,000	606,413	629,000				
Alt 3. LRT	310,592	323,000	614,054	640,000	1.93%	2.22%	1.26%	1.75%
Alt 5. Metrorail	309,187	321,000	602,673	624,000	1.47%	1.58%	(0.62%)	(0.79%)
Alt 5A. Metrorail Hybrid	309,187	321,000	602,673	624,000	1.47%	1.58%	(0.62%)	(0.79%)
Alt 6. Enhanced BRT	307,879	320,000	615,945	644,000	1.04%	1.27%	1.47%	2.38%

2030 - Forecast from 2006 Report using SERPM 6

2040- Updated forecast using SERPM 7 2040 SE Data

Cost for Alternatives:

Capital and Operating and Maintenance (O&M) cost for each alternative evaluated in the Tier I and Tier II analysis of the 2006 South Link Study were updated based on available information. For those alternatives that were carried forward from Tier I to Tier II, the same cost was used in both the Tier 1 and Tier II evaluation updates.

Costs in the 2006 South Link Study were presented in 2005 dollars. The cumulative inflation in the United States between 2004 and 2014 was 22.66% and 21.2% as documented by inflationdata.com based on the Consumer Price Index (CPI) published by the US Bureau of Labor Statistics and usinflationcalculator.com also documented as based on CPI, respectively. The average cumulative inflation rate of 22% was used to convert 2005 costs to 2014 costs for this report.

Capital Costs

Capital costs, fixed one-time expenses to build the system, were calculated as follows:

- For Alternative 2 (TSM/Baseline), Alternative 5A (Hybrid), Alternative 6 (BRT Enhanced), and Alternative 6 (DMU) capital costs were inflated to 2014 dollars since details of these proposed alternatives were not available and lack of data on comparable systems.
- For Alternative 3 (LRT) and Alternative 5 (Metrorail), the Federal Transit Administration (FTA) Cost Model using the FTA Capital Cost Database was used to determine “order-of-magnitude” cost estimates. Costs in the database are based on federally-funded projects and FTA’s Standard Cost Categories. Available data was inputted into the Cost Model to determine the estimated cost. The costs calculated using FTA’s Cost Model in 2014 dollars were compared to the 2005 costs inflated to 2014 dollars. The range of these costs are presented in this report.
- For Alternative 4 (Metrorail plus BRT), the unit costs calculated from Alternative 5 (Metrorail) were used.

The updated capital costs for each alternative in both Tier I and Tier II are shown in **Table 5 – Capital Costs**, in comparison to the capital cost developed in the 2006 South Link Study.

TABLE 5 – Capital Costs (millions)

Alternative	2005 \$	2014 \$
Alt 2. TSM/Baseline	\$126.5	\$154.33
Alt 3. LRT	\$853.9	\$1,042.0 - \$1,383.0
Alt 4. Metrorail + BRT*	\$895.4	\$1,165.2 - \$1,287.4
Alt 5. Metrorail	\$1,649.8	\$2,012.7 - \$2,821.6
Alt 5A. Metrorail Hybrid	\$1,208.6	\$1,474.50
Alt 6. Enhanced BRT	\$423.3	\$516.26
Alt 7. DMU*	\$325.5	\$397.11

* Indicates a Tier I alternative

Operating and Maintenance Costs (O&M)

Operating and Maintenance Costs (O&M) are annual expenses related to the operations and maintenance of a facility. The O&M costs calculated in the 2006 South Link Study were based on the FTA methodology and available information at the time. The FTA methodology uses cost for vehicle hours of operations, vehicle miles, and peak vehicle days which normally include operations, maintenance, and administration. The 2006 South Link Study used this methodology to calculate the O&M costs for the background bus network for all alternatives and Alternative 5 (Metrorail).

The projected O&M costs calculated in the 2006 South Link Study for the bus background network was compared to the actual bus O&M costs recorded for 2005. It was found that the projected O&M cost was underestimated compared to the actual cost recorded by Miami-Dade Transit (MDT). An adjustment factor was applied to the estimates and inflated to 2014 dollars. The O&M cost for the background network is included in each alternative

and is the O&M cost for Alternative 1 (No Build). This same methodology was applied to the difference in the bus background network for each alternative. After applying this methodology, no further calculations were necessary for Alternative 3 (TSM/Baseline).

Since there is not an existing LRT system in Miami-Dade County for reference or comparison, the O&M cost calculated for Alternative 3 (LRT) in the 2006 South Link Study was reviewed and compared to the estimated O&M cost in the 2015 Beach Corridor Transit Connection Study on a per revenue mile basis and ranged from \$12.69 per revenue mile to \$32.07 per revenue mile (in 2014 dollars), respectively. O&M cost for existing Light Rail Transit systems, based on the 2013 National Transit Databased (NTD), were also reviewed. O&M costs for the LRT systems reviewed, ranged from \$6.98 to \$41.75 with an average of \$19.74 per revenue mile (in 2014 dollars). The substantial variation results from the age of the system, the size of the system, bookkeeping by an individual agency, union versus non-union, and cost of living for the various cities. The range of O&M costs between the 2006 South Link Study and the 2015 Beach Corridor Transit Connection Study fall within the range of existing systems. The average O&M from these two studies was applied to the proposed system in Alternative 3 (LRT) to determine the O&M costs.

The O&M cost for Metrorail in the 2006 South Link Study used a more detailed FTA methodology based on a detailed MDT cost model that includes eight cost factors including: cost for platform hours, passenger boardings, stations, yards, and track miles in addition to the train hours of operation, vehicle miles, and number of vehicles used in the Metrobus O&M calculations. However, in the absence of updated costs, the same methodology used to determine the O&M cost for the background bus network was used to estimate Metrorail O&M costs. The projected O&M costs calculated in the 2006 South Link Study for Metrorail was compared to the actual bus O&M costs recorded for 2005 for Metrorail. It was found that the projected O&M cost was underestimated compared to the actual cost recorded by MDT. An adjustment factor was applied to the estimates and inflated to 2014 dollars. Similar to the 2006 South Link Study, the O&M cost estimated for Alternative 5 (Metrorail) was also assumed for Alternative 5A (Metrorail Hybrid).

Many transit agencies with existing BRT systems do not report separate O&M BRT costs in the National Transit Database (NTD) but rather include BRT O&M costs in with their bus O&M costs. Similarly, the O&M cost for the Busway is not reported separately as a BRT system but instead included with the other bus O&M cost for Miami-Dade Transit (MDT). The additional cost for BRT O&M from the 2006 South Link Study was calculated the same way the bus background network was calculated with the adjustment factor and inflated to 2014 dollars. This method identified a BRT O&M cost of \$7.89 per revenue mile. O&M costs for existing BRT systems were also researched. The Lane Transit District (LTD) in Eugene, Oregon and the Greater Cleveland Regional Transit Authority (GCRTA) reported BRT O&M costs separate from bus O&M cost in the NTD; LTD as \$13.21 per revenue mile in the 2012 NTD (The 2013 NTD was not available for Eugene) and GCRTA reported \$9.58 per revenue mile in the 2013 NTD. The reported BRT O&M cost for these two agencies were similar to their reported bus O&M cost. LTD reported \$10.47 per revenue mile for their bus O&M and GCRTA reported \$11.80 per revenue mile for their bus O&M for the same time periods. Therefore, the BRT O&M cost upper limit was calculated using the same O&M cost as the bus O&M for MDT in 2014 using \$11.17 per revenue mile.

Alternative 4 (Metrorail + BRT) and Alternative 7 (DMU) are Tier I alternatives that were not advanced to Tier II, therefore there is limited information on their system operations. O&M costs shown are based on cost per mile for bus and train. The bus O&M cost is based on the background bus network. The Metrorail O&M is based on the O&M cost for Alternative 5 and the DMU O&M was inflated to 2014 dollars.

The updated and the 2006 South Link Study O&M costs for the Tier II alternatives are shown in **Table 6 – O&M Cost for Tier II Alternatives**. The O&M costs for each alternative are separated by O&M costs for the background bus system and O&M cost for the proposed system. Also shown for each alternative are the O&M costs above the No Build alternative.

TABLE 6 – O&M Costs for Tier II Alternatives (millions)

Alternative	Background Bus O+M Cost		Build O+M Cost		O+M Cost above No Build	
	2005 \$	2014 \$	2005 \$	2014 \$	2005 \$	2014 \$
Alt 1. No Build	\$227.9	\$397.6				
Alt 2. TSM	\$236.1	\$412.0			\$8.2	\$14.4
Alt 3. LRT	\$218.6	\$381.4	\$28.4	\$61.9	\$19.1	\$45.7
Alt 5. Metrorail	\$218.6	\$381.4	\$46.7	\$89.6	\$37.4	\$73.4
Alt 5A. Metrorail Hybrid	\$218.6	\$381.4	\$46.7	\$89.6	\$37.4	\$73.4
Alt 6. Enhanced BRT	\$236.3	\$416.5	\$2.4	\$4.2	\$10.8	\$18.9

Annualized costs, the annual cost of owning a system or asset over its lifespan, are needed to determine transit user benefits and cost effectiveness. Annualized costs are based on the numbers of years a system is expected to be in service and the annualized factor. The factors used in the 2006 South Link Study were applied to the capital cost to determine the annualized capital costs. O&M costs are presented on an annualized bases.

Cost-Benefit Analysis of Alternatives:

As noted previously, the Tier I analysis was a more qualitative analysis than the Tier II analysis. The criteria in the Tier I analysis that could be updated for those alternatives that were not forwarded to Tier II is shown in **Table 7 – Tier I Evaluation Matrix**, in comparison to the data in the 2006 South Link Study.

TABLE 7 – Tier I Evaluation Matrix

Criterion	Alt 1. No-Build		Alt 4. Metrorail + BRT		Alt 7. DMU	
	2030	2040	2030	2040	2030	2040
Future employment near stations	40,943	51,793	31,724	40,131	64,083	53,317
Future population near stations	102,909	105,070	86,929	88,755	148,370	135,462
	2005 \$	2014 \$	2005 \$	2014 \$	2005 \$	2014 \$
Capital Cost per mile (millions)			\$81.40	\$105.9 - \$148.5	\$15.50	\$18.90
Total Capital Cost Range			\$895.4	\$1,165 - \$1,634	\$325.5	\$397.0
Operating and Maintenance Costs	\$227.9	\$397.6				
System operating cost per mile	\$6.44 / bus mi	\$9.15 / bus mi	\$6.44 / bus mi	\$9.15 / bus mi	\$6.44 / bus mi	\$9.15 / bus mi
			\$8.59 / train mi	\$9.91 / train mi	\$11.56 / train mi	\$14.10 / train mi

The cost-effectiveness and cost benefit analyses performed in the 2006 South Link Study were based on the Federal Transit Administration's (FTA) cost-effectiveness ratios for analysis of alternatives and include:

- Cost per hour of user benefit – incremental cost and benefits of build alternatives
- Cost per new rider

The user benefit and cost per new rider were updated by on the annualized costs. The user benefit hours used to calculate the user benefit comes from the travel demand model. Since travel demand modeling was not part of this scope, the user benefit hours from the 2006 South Link Study were used and left constant. The updated User Benefits of Tier II Alternatives in comparison to the 2006 South Link Study are shown in **Table 8 – User Benefits of Tier II Alternatives**.

TABLE 8 – User Benefits of Tier II Alternatives

Alternative	Alt 3. LRT		Alt 5. Metrorail	
	2005 \$	2014 \$	2005 \$	2014 \$
Annualized Capital Cost (in 000's)	\$66,843	\$81,500 - \$108,170	\$124,570	\$151,929 - \$212,983
Annual O+M Cost (in 000's)	\$10,923	\$31,379	\$29,236	\$58,992
Total Annualized Cost (in 000's)	\$77,766	\$112,879 - \$139,549	\$153,806	\$210,921 - \$271,975
User Benefit Hours (annual)	1,337,485		1,399,748	
Cost/Hour of User Benefit	\$58.14	\$84.40 - \$104.34	\$109.88	\$150.70 - \$194.30

* User Benefit Hours used from 2006 South Link Study

Alternative	Alt 5A. Metrorail Hybrid (Optional)		Alt 6. Enhanced BRT	
	2005 \$	2014 \$	2005 \$	2014 \$
Annualized Capital Cost (in 000's)	\$94,370	\$114,315	\$33,927	\$40,722
Annual O+M Cost (in 000's)	\$29,236	\$58,992	\$2,584	\$4,508 - \$6,245
Total Annualized Cost (in 000's)	\$123,606	\$173,307	\$36,511	\$45,231 - \$46,967
User Benefit Hours (annual)	1,399,748		1,147,010	
Cost/Hour of User Benefit	\$88.31	\$129.58	\$31.83	\$39.43 - \$40.95

* User Benefit Hours used from 2006 South Link Study

The updated Cost per New Rider in comparison to the 2006 South Link Study are shown in **Table 9 – Cost per New Rider of Tier II Alternatives**.

TABLE 9 – Cost per New Rider of Tier II Alternatives

Alternative	Alt 2. TSM/Baseline		Alt 3. LRT	
	2005 \$	2014 \$	2005 \$	2014 \$
Annualized Capital Cost (in 000's)	\$15,863	\$19,353	\$66,843	\$81,500 - \$108,170
Annual O+M Cost (in 000's)	\$8,823	\$14,360	\$17,502	\$45,739
Total Annualized Cost (in 000's)	\$24,687	\$33,713	\$84,345	\$127,239 - \$153,909
	2030	2040	2030	2040
New Riders	1,360	1,400	7,232	8,000
Annual New Riders	421,600	437,720	2,241,920	2,325,000 - 2,542,000
Cost Per New Rider	\$58.55	\$77.02	\$37.62	\$50.05 - \$66.20

Alternative	Alt 5. Metrorail		Alt 5A. Metrorail Hybrid (Optional)	
	2005 \$	2014 \$	2005 \$	2014 \$
Annualized Capital Cost (in 000's)	\$124,570	\$151,929 - \$212,983	\$94,370	\$114,315
Annual O+M Cost (in 000's)	\$37,467	\$73,352	\$37,467	\$73,352
Total Annualized Cost (in 000's)	\$162,037	\$225,281 - \$286,335	\$126,837	\$187,667
	2030	2040	2030	2040
New Riders	5,827	6,500	5,827	6,500
Annual New Riders	1,806,370	1,875,500 - 2,042,900	1,806,370	1,875,500 - 2,042,900
Cost Per New Rider	\$89.70	\$110.28 - \$152.67	\$72.98	\$91.86 - \$100.00

Alternative	Alt 6. Enhanced BRT	
	2005 \$	2014 \$
Annualized Capital Cost (in 000's)	\$25,366	\$40,722
Annual O+M Cost (in 000's)	\$10,815	\$18,868 - \$20,605
Total Annualized Cost (in 000's)	\$36,181	\$59,591 - \$61,327
	2030	2040
New Riders	4,500	5,000
Annual New Riders	1,395,000	1,453,900 - 1,571,700
Cost Per New Rider	\$25.94	\$37.91 - \$42.18

A summary of the updated Tier II criteria in comparison to the 2006 South Link Study is shown in **Table 10 – Tier II Evaluation Matrix**.

TABLE 10 – Tier II Evaluation Matrix

Alternative	Alt 2. TSM		Alt. 3 LRT		Alt. 5 Metrorail		Alt 5A. Metrorail Hybrid		Alt 6. Enhanced BRT	
	2030	2040	2030	2040	2030	2040	2030	2040	2030	2040
Total Transit Trips	304,720	316,000	310,592	323,000	309,187	321,000	309,187	321,000	307,879	320,000
Total Transit Boardings	606,413	629,000	614,054	640,000	602,673	624,000	602,673	624,000	615,945	644,000
New Riders	1,360	1,400	7,232	8,000	5,827	6,500	5,827	6,500	4,500	5,000
New Boardings	2,706	2,800	7,641	8,500	(3,740)	(2,500)	(3,740)	(2,500)	9,532	17,500
Rail Boardings	235,712	245,000	257,798	269,000	244,516	254,000	244,516	254,000	238,100	247,000
Bus Boardings	330,643	343,000	315,923	327,000	317,656	329,000	317,656	329,000	337,479	355,000
	Alt 2. TSM		Alt. 3 LRT		Alt. 5 Metrorail		Alt 5A. Metrorail Hybrid		Alt 6. Enhanced BRT	
	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
Current Employment near stations	40,313	45,191	34,036	38,154	24,478	27,440	24,478	27,440	39,420	44,190
Current Population near stations	57,871	68,056	47,746	56,149	32,848	38,629	32,848	38,629	56,515	66,462
Current Low-income HH	2,766	3,162	2,298	2,627	1,075	1,229	1,075	1,229	3,560	4,069
	2030	2040	2030	2040	2030	2040	2030	2040	2030	2040
Future Employment near stations	59,869	75,734	50,010	63,263	35,759	45,235	35,759	45,235	58,792	74,372
Future Population near stations	98,173	100,235	79,125	80,787	57,318	58,522	57,318	58,522	95,012	97,007
	Alt 2. TSM		Alt. 3 LRT		Alt. 5 Metrorail		Alt 5A. Metrorail Hybrid		Alt 6. Enhanced BRT	
	2005 \$	2014 \$	2005 \$	2014 \$	2005 \$	2014 \$	2005 \$	2014 \$	2005 \$	2014 \$
Capital Costs (millions)	\$126.5	\$154.3	\$853.9	\$1,041.8 - \$1,382.6	\$1,649.8	\$2,012.7 - \$2,821.6	\$1,208.6	\$1,474.5	\$423.3	\$516.3
O&M Costs (Change from No-Build) (millions)	\$8.2	\$14.4	\$19.2	\$45.7	\$37.5	\$73.4	\$37.5	\$73.4	\$10.8	\$23.1
Annual cost/new rider	\$58.55	\$77.02	\$38.36	\$50.05 - \$66.20	\$89.70	\$110.28 - \$152.67	\$72.98	\$91.86 - \$100.00	\$25.94	\$37.91 - \$42.18
Cost/(Hour of user benefit)			\$58.14	\$84.40 - \$104.34	\$109.88	\$150.70 - \$194.30	\$88.30	\$129.58+	\$31.83	\$39.43 - \$40.95

Recommendations:

Based on the analysis above, the recommended alternative is Alternative 6 (Enhanced BRT) which is the same alternative that was recommended in the 2006 South Link Study. This recommendation was anticipated since the alternatives and operating systems remained the same and the relationship among the alternatives did not change significantly. Both the cost per hour of user benefit and the cost per new rider for Alternative 6 (Enhanced BRT) are substantially less than the respective costs compared to other alternatives and support this conclusion. The cost per user benefit hour for the Enhanced BRT is around \$40/hour of user benefit and the next closest is Alternative 3 (LRT) with a cost of \$84.40/hour of user benefit. The cost per new rider for Alternative 6 (Enhanced BRT) is \$40/new rider and the next closest is Alternative 3 (LRT) with a range of \$50.05 to \$66.20 per new rider.

This alternative was the Locally Preferred Alternative (LPA) identified in the 2006 South Link Study. The MPO Governing Board voted to support the “Modified Enhanced Bus Rapid Transit (BRT) Alternative 6 with a provision of supporting a long-range Metrorail extension south of SW 104th Street as demand warrants as the Locally Preferred Alternative for the South Miami-Dade Transit Corridor,” as stated in MPO Resolution # 30-06, dated June 22, 2006.

Planned Projects in the Study Area:

The Miami-Dade Transit’s (MDT’s) Transit Development Plan (TDP) FY 2016 – 2025 and the 2040 Long Range Transportation Plan (LRTP) were reviewed for planned projects in the study area. Three projects were identified in the TDP and several projects were identified in the Transportation Improvement Program (TIP) and LRTP as follows:

TDP

- Busway ADA Improvements - Continuation of pedestrian accessibility improvement along South Miami-Dade Busway. (2016)
- Busway Park-and-Ride Lot (Quail Roost Drive) – Construct park-and-ride facility at Busway and SW 184th Street. (2018)
- Busway Lot – Construct park-and-ride facility with 150 parking spaces at Busway and SW 200th Street. (2020) – Privately funded.

TIP

- SR 5/US 1/S Dixies Highway from SW 152nd Street to SR 9/I-95, PD&E/EMO Study
- MDT – South Miami Dade Busway routes operating assistance from Dadeland to Florida City
- Park and Ride Facility at SW 168th Street and Busway, acquire land at SW 168th Street & Busway for a park and ride facility. Acquisition completed FY10-11, currently undergoing land improvements
- SW 137th Avenue from SR-821 (HEFT) to US 1, widen from 2 to 4 lanes, under design
- SW 137th Avenue from US 1 to SW 200th Street, completion as two continuous lanes under design
- SW 268th Street from US 1 to SW 112th Avenue, continuous left turn lane along SW 268th Street, under design
- SW 264th Street from SW 147th Avenue to US 1, new two lane road with center turn lane, under design
- SW 312th Street/Campbell Drive from SR 997/Krome Avenue to SR 5/US 1, new road construction
- SW 328th Street from US 1 to SW 162nd Avenue, widen to 4 lanes, design complete

L RTP

- Priority II (2021-2025)
 - Construct Busway park-and-ride facility at US-1 Busway and SW 104th Street with 250-300 surface parking spaces
 - Expand overcapacity park-and-ride lot at SW 152nd Street with new parking garage with 500 parking spaces
 - Metrorail park-and-ride facility at Dadeland South, expand park-and-ride facility with 1000 parking space garage
- Priority III (2026-2030)
 - Ramps between US-1 Busway and SR-826 (Palmetto) from US-1 Busway to SR-826 (Palmetto), construct ramps connecting the US-1 Busway to SR-826 (Palmetto)
 - SR-821 (HEFT) from SW 137th Avenue to SW 216th Street, widen to 8 lanes, include express lanes for portion of project length
 - SR-821 (HEFT) from SW 312th Street (Campbell Drive) to SW 288th Street, widen to 6 lanes
 - SR-821 (HEFT) from SW 288th Street to SW 137th Avenue (Speedway), widen to 8 lanes
- Priority IV (2031-2040)
 - SW 137th Avenue from US-1 to SW 184 Street, add 2 lanes and reconstruct
 - SW 152nd Street (Coral Reef) from SR-821 (HEFT) to US-1, add 2 lanes and reconstruct
 - US-1 at SW 27th Avenue, grade separation of US-1 over SW 27th Avenue
 - US-1 at SW 344th Street (Palm), grade separated overpass
- Partially Funded Projects
 - US-1 Managed Lanes from SW 344th St (Palm) to Dadeland South Metrorail Station, Add 2 /1 reversible new managed lanes within the ROW of the Busway
- Privately Funded Projects
 - Busway Lot at SW 200th Street and US-1 Busway, construct park-and-ride facility with 140 surface spaces
- Unfunded
 - Busway park-and-ride facility at US-1 Busway and SW 112th Street, construct new park-and-ride facility with minimum of 200 spaces
 - Kiss-and-Rides at all Busway Stations between SW 344th St (Palm)/ Busway and Dadeland South Metrorail Station
 - Park-and-Ride at SW 152nd Street and SR-821 (HEFT)

Most of the planned projects in the corridor relate to additional park-and-ride lots. There are three widening projects on the HEFT in Priority 3 that will provide additional capacity to the area. Only the US-1 Managed Lanes from SW 344th St (Palm) to Dadeland South Metrorail Station with new reversible managed lanes within the ROW of the Busway will provide the much needed additional capacity to the corridor.

There are other potential improvements that will provide a range of relief to the already congested corridor. First, there are policy decisions that should be made and/or agreed upon before moving forward even with a study. Following are a list of the policy decisions or direction that there should be a consensus on to move forward and a list of potential capital improvements that may need to be studied further to determine their feasibility.

Policy Decisions:

- Should the corridor be reserved for an existing and future rail corridor i.e., maintain an operational Busway with alternatives and reserve for future Metrorail extension?
- Is this a corridor a potential for a Public Private Partnership – P3?

Potential improvements in addition to the alternatives already presented are presented below. The potential improvements are not all individual improvements, most can be used in combination with other potential improvements.

- Additional TSM alternatives based on the latest technology, use overhead signs to warn and reroute drivers, provide real time travel information
- Signal timing / prioritization to provide continuous travel for buses on the Busway
- Decrease headways on routes that serve the Busway, Routes 31 – Busway Local, 34 – Busway Flyer, and 38 Busway Max
- Provide additional feeder buses to the Busway
- Add more frequent bus service especially in the peak periods and more routes that connect to the Busway;
- Build additional park-and-ride lots as soon as possible or lease land or space in existing nearby parking facilities
- Use new branded buses for the Busway
- Grade separated intersections for all intersections on the Busway, to allow buses to travel the Busway without stopping at intersections
- Reversible lanes on the Busway or on US 1
- Open the Busway to traffic without charging
- CSX corridor as a rail option in coordination in combination with the Busway
- A light rail transit system using overhead catenary system or wireless LRT
- Reconfigure the US 1 corridor integrating the Busway into the corridor for greater efficiency

Project Phasing:

Phasing to implement any of the alternatives is dependent the selected mode and on available funding and the funding source or sources that will be pursued. Today, there are many potential funding sources including some delivery methods that are more widely used than in 2005/2006 when the original study was conducted. The potential funding sources may include, federal (FHWA, FTA), state, local, or private funds. In addition, the project delivery may be the traditional design/bid/build, design/build, or through a public private partnership (P3). P3 projects offer innovative procurements, alternative delivery methods, and alternate funding and financing options for major capital projects.

The recommended phasing is to begin development in the northern segment of the Busway that has high density land use, severe congestion, and high demand; at approximately SW 200th Street and north. In general, the area south of SW 200th Street has less density, congestion, and demand.

Even though, it may take a few years to conduct further necessary studies and obtain consensus on a locally preferred alternative, work that is common to multiple alternatives may begin. First, new park-and-ride lots should

proceed in locations including necessary environmental, design, and build where they are proposed for several alternatives. The following park-and-ride lots are proposed for all the Tier I alternatives except Alternative 7 DMU.

- SW 200th Street – TDP for 2020, privately funded; LRTP, privately funded
- SW 184th Street – TDP for 2018
- SW 112th Street – LRTP, unfunded
- SW 104th Street – LRTP, Priority II
- SW 152nd Street – Expand with new parking garage, LRTP, Priority 2

Other early phase enhancements may include additional feeder bus service to the Busway, signal timing/priority to allow continuous flow for buses on the Busway, and additional service provided on the Busway, especially in the northern section to accommodate the additional demand due to the added park-and-ride lot capacity. Environmental assessments for proposed grade separated intersections should also begin for SW 152nd Street and SW 200th Street for the Enhanced BRT alternative and necessary environmental documentation for all Tier II alternatives.

The Phasing Plan for the recommended alternative, Alternative 6 (Enhanced BRT) is as follows:

Phase I (1-5 years after LPA is selected/reconfirmed)

- EIS/EA for BRT modification and park-and-ride locations
- New park-and-ride locations at: SW 200th Street, SW 184th Street, SW 112th Street, SW 104th Street, and expand park-and-ride at 152nd Street with new parking garage
- Begin signal timing/priority in the northern section of the Busway
- EIS/EA for Metrorail extension
- EA for grade separations at SW 152nd Street and SW 200th Street

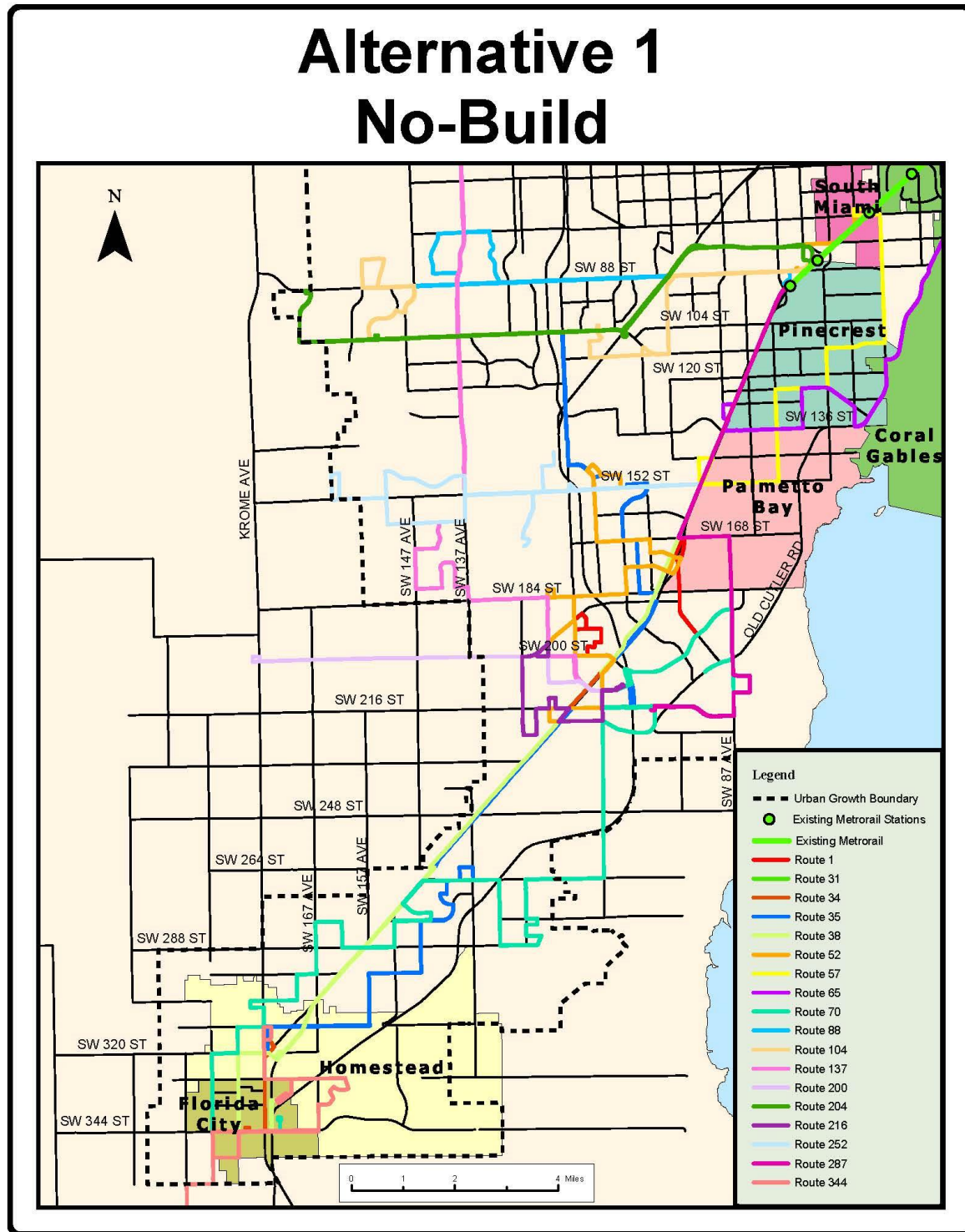
Phase II (6-15 years after LPA is selected/reconfirmed.)

- New park-and-ride lots at SW 124th Street, SW 244th Street, SW 136th Street
- Expand park-and-ride locations at SW 244th Street
- Construct Metrorail extension
- Construct grade separations at SW 112th Street, SW 136th Street, SW 184/186th Street, SW 211/216th Street, and SW 312th Street.

Appendix – Tier 1 Alternatives

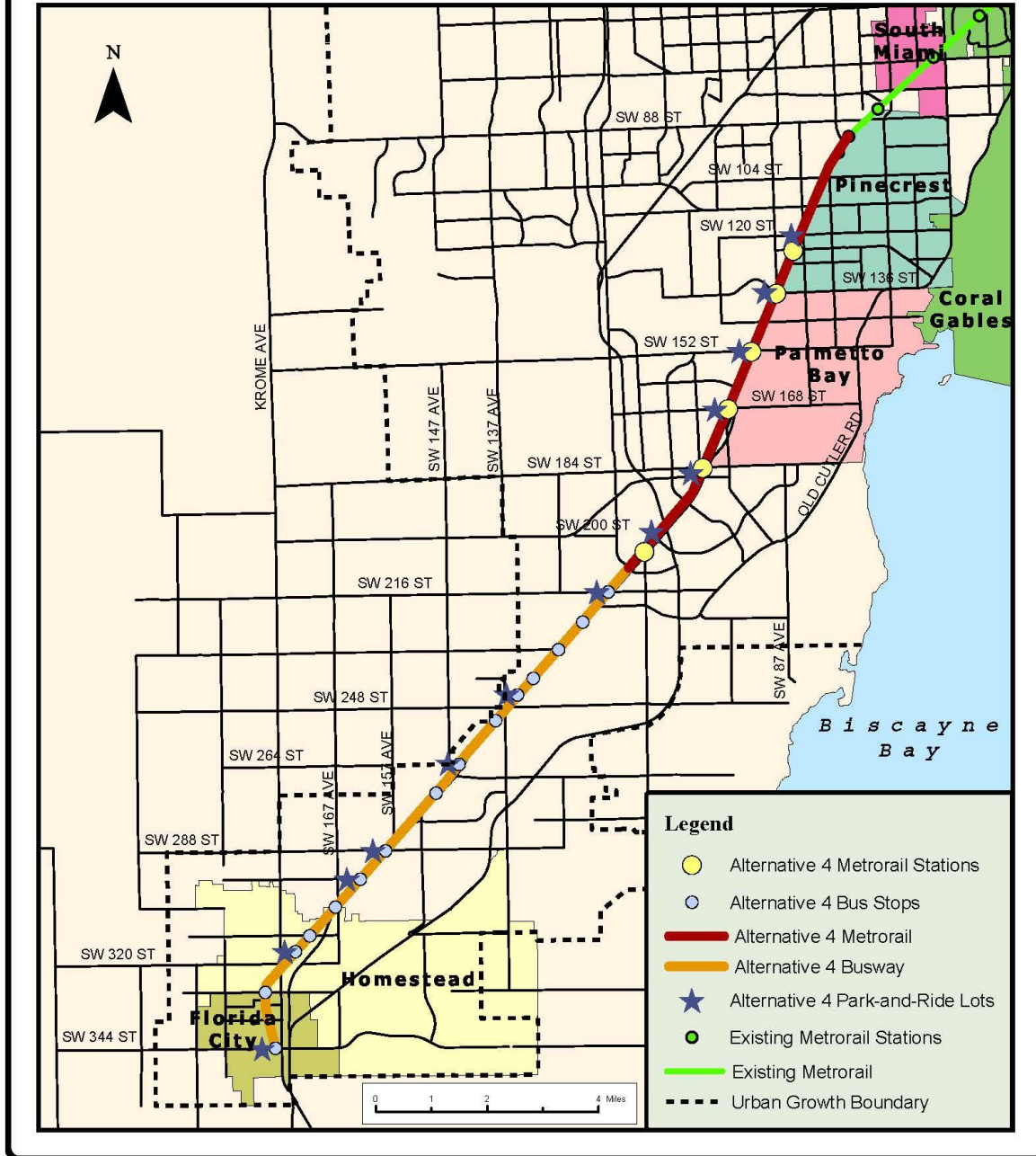
(Tier 1 alternatives that were not advanced to Tier II)





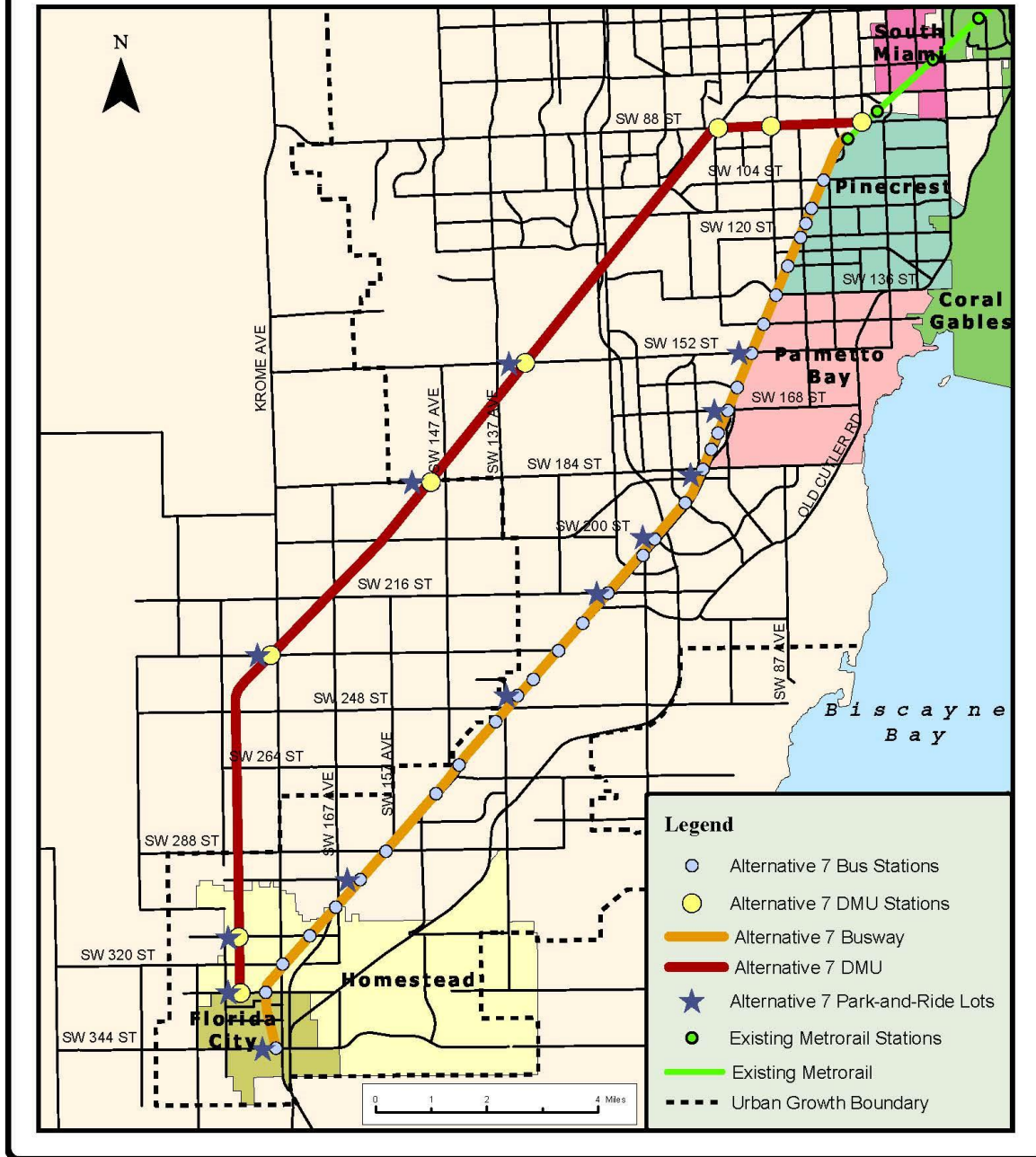
Source: South Miami-Dade Corridor Alternative Analysis Report (South Link Study), June 2006, The Corradino Group, Inc., page 99.

Alternative 4 Metrorail to Southland Mall

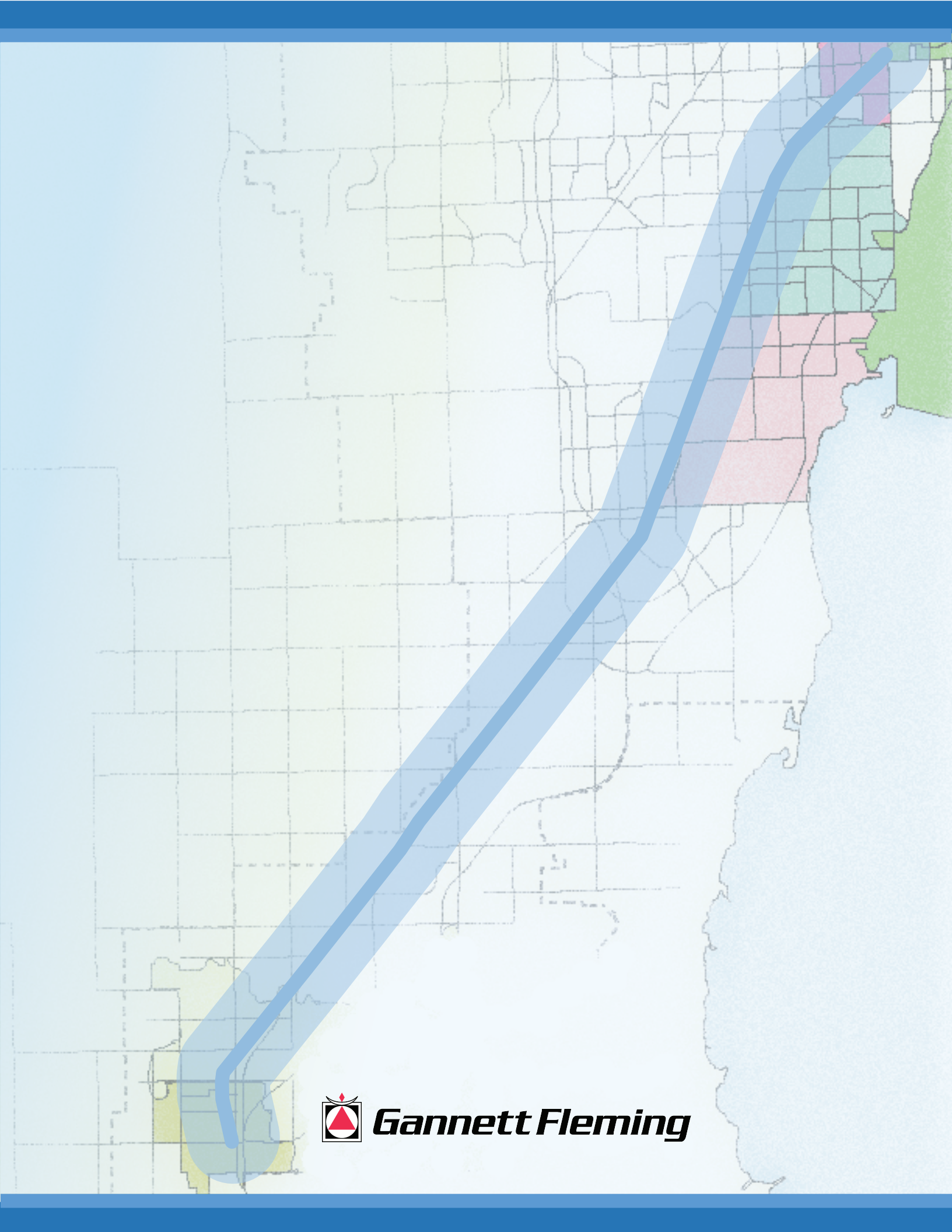


Source: South Miami-Dade Corridor Alternative Analysis Report (South Link Study), June 2006, The Corradino Group, Inc., page ES-11.

Alternative 7 DMU in the CSX Corridor



Source: South Miami-Dade Corridor Alternative Analysis Report (South Link Study), June 2006, The Corradino Group, Inc., page ES-15.



Gannett Fleming