

# South Dade TransitWay BRT to Rail Conversion Guide

Executive Summary  
July 2024

## Introduction

The South Dade TransitWay is one of the six premium transit corridors of the Strategic Miami Area Rapid Transit (SMART) Program. The location of the South Dade TransitWay, also referred to as the South Corridor in this report, is illustrated in **Figure 1**. The South Corridor is a Bus Rapid Transit (BRT) corridor that spans approximately 20 miles from SW 344<sup>th</sup> Street to the Dadeland South Metrorail Station.

The South Dade TransitWay is currently under construction. The Transit Way Corridor is envisioned to be converted to heavy rail operation at some point in the future. This 20-mile-long heavy rail extension was meant to preserve a “one seat ride” for passengers from the existing end of the line station at Dadeland South to Florida City. To that end, the BRT stations are being built to accommodate the operation of Metrorail heavy rail vehicles. The gate arm design at all intersections has been developed to account for the dynamic envelope of Metrorail vehicles retrofitted with a pantograph to draw electric power from an Overhead Contact System (OCS), as light rail systems.

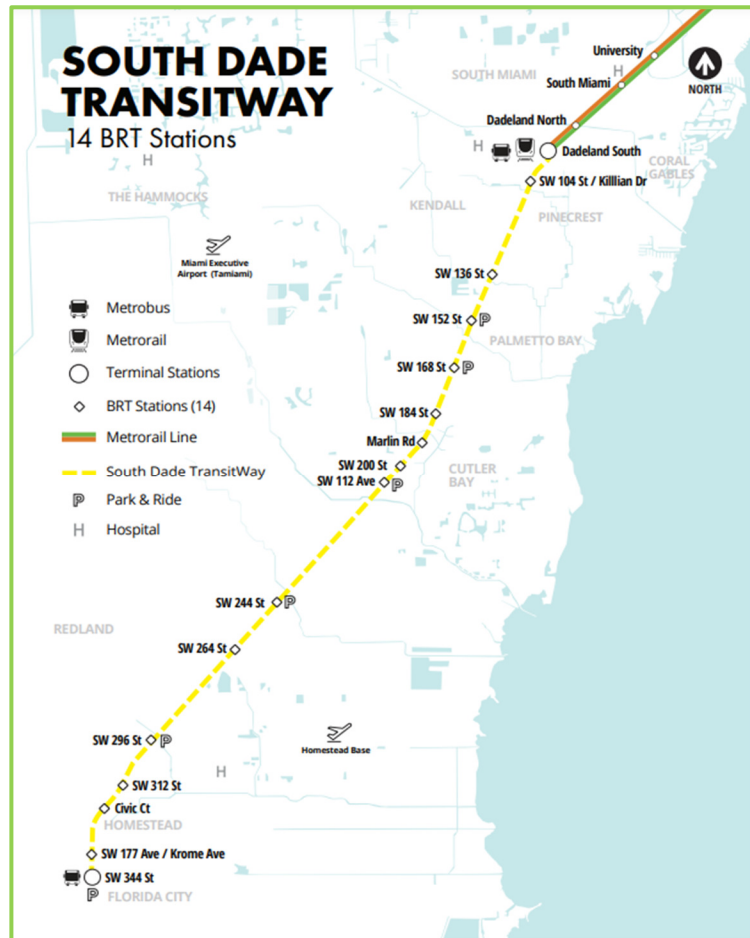


Figure 1 - South Dade TransitWay Map

BRT-to-rail conversion projects are a popular consideration when designing or expanding a BRT system. Cities with heavy traffic congestion and high-capacity transit needs often opt for BRT over Light Rail Transit (LRT) or Heavy Rail Transit (HRT) due to the lower up-front costs and greater flexibility but want to keep the possibility of future conversion to LRT or HRT open.

## Report Structure

The BRT to Rail Conversion Report includes the following sections: a Literature Review, a BRT to Rail Conversion Guide, and the South Dade TransitWay BRT to Rail Blueprint. The Literature Review is comprised of a summary of BRT to rail projects in the United States and Canada. The BRT to Rail Conversion Guide explores applicable federal, state, and local regulations in further detail, as well as any potential

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constraints of converting the South Dade TransitWay Corridor from BRT to rail. The South Dade TransitWay BRT to Rail Blueprint provides a roadmap for the conversion of the South Dade TransitWay from BRT to modified Metrorail heavy rail technology.

## Report Findings

While numerous BRT projects have been designed with rail conversions in mind, there are very few examples of completed BRT to rail projects in the U.S. and Canada. As such, this report largely focuses on information from the Ottawa Canada BRT to LRT conversion project shown in **Figure 2**. The extent to which BRT to rail projects can successfully convert to rail varies based on a number of factors, including the type and size of BRT and rail vehicles, physical station characteristics, and compatibility with current technologies.



Figure 2 - Confederation Line (Ottawa, CA) BRT to Rail Conversion Project

**Table 1** and **Table 2** list U.S. projects that included LRT considerations in their initial BRT design characteristics, separated by BRTs with bus only right of way, versus those that cross general traffic.

<i>Table 1 BRT Projects that Included LRT Provisions (as of 2006) in the U.S.: Bus Only Right of Way</i>		
Project	Existing or Proposed	Rail Provisions
Boston, MA — Silver Line tunnel sections	Existing	Yes* The early designs for the Boston Silver Line (originally South Boston Piers busway) were designed for conversion to rail.
Hartford, CT —	Proposed	Yes*

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Table 1 BRT Projects that Included LRT Provisions (as of 2006) in the U.S.: Bus Only Right of Way

Project	Existing or Proposed	Rail Provisions
New Britain-Hartford Busway		
Jacksonville, FL — North-Southeast Busway	Proposed	Yes Horizontal and vertical alignment considered LRT requirements
Los Angeles, CA — Metro Orange Line	Existing	Yes Some allowances for LRT included: <ul style="list-style-type: none"> <li>• 90% of the horizontal alignment suitable for rail</li> <li>• Vertical geometry suitable for LRT conversion (guideway constructed within an abandoned heavy rail alignment)</li> <li>• Structures constructed for LRT loading; however, some of the bridges need to be rebuilt</li> <li>• Platforms would need to be rebuilt; currently short platforms (suitable for buses only) on the far side of intersections</li> <li>• Alignment is not grade-separated at intersections (36 intersections along alignment)</li> </ul>
Pittsburgh, PA — East/South and West Busway	Existing	Yes Some allowances for LRT included <ul style="list-style-type: none"> <li>• Notches in the retaining walls for future catenary columns</li> <li>• Additional weights or loadings of the track structure and revenue vehicles in the design of the roadway pavement slab and bridge structures</li> <li>• Additional horizontal and vertical clearances for the added track structure and LRT vehicle dynamic envelope, including overhead catenary system and side poles, span wires, and mounting brackets</li> <li>• Alignment (including horizontal and vertical curves and grades)</li> <li>• Clearances are set to allow for light rail vehicles and catenary columns</li> </ul>
Seattle, WA — Downtown Seattle Transit Tunnel	Existing	Yes <ul style="list-style-type: none"> <li>• Adequate clearances for LRT vehicles</li> <li>• Alignment (including horizontal and vertical curves and grades)</li> </ul>
*Limited information available		

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*Table 2 BRT Projects with Bus and General Traffic or HOV Interaction (as of 2006) in the U.S.*

Project	Existing or Proposed	Rail Provisions
Boston, MA — Silver Line (arterial sections)	Existing	Yes (early stages only) * The early designs for the Boston Silver Line (originally South Boston Piers Busway) were designed for conversion to LRT.
Cleveland, OH — Euclid Avenue BRT	Proposed	No Early stages planned for LRT; however, current design and operation plans would make it difficult for conversion.
Los Angeles, CA—El Monte Busway	Existing	Yes* <ul style="list-style-type: none"> <li>• Aerial structures designed to accommodate LRT</li> <li>• El Monte busway designed for eventual conversion; however, based on current operation, it appears unlikely that this will happen</li> </ul>

\*Limited information available on the LRT components included.

## Funding Sources and Considerations

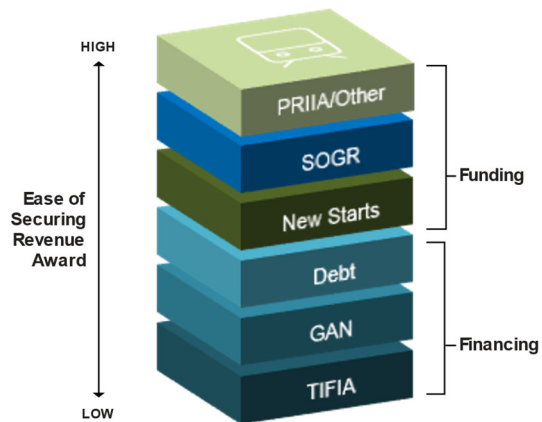
Possible funding and financing sources that may be available to support conversion of the corridor from BRT to HRT include:

**Federal** – Capital Investment Grants: New Starts, Small Starts and Core Capacity (CIG Section 5309), State of Good Repair (SOGR Section 5337 Formula), Rail Vehicle Replacement (SOGR Section 5337 Competitive), RAISE, PROTECT, CMAQ, TIFIA; **State/Local**- Moving Florida Forward, County Incentive Grant Program (CIGP).

Additional details on each of the above funding sources can be found in **Section 3** of the report.

A large potential source of federal funding for the BRT to HRT Conversion Project are FTA Capital Investment Grants (CIG Section 5309). A summary of the process to apply for CIG Grants is included in **Figure 4** on the following page.

**Figure 3** illustrates a general funding framework for creating a capital stack to fund a project such as the South Dade TransitWay conversion project.



*\* Illustrative purposes only  
Figure 3 - Creating a Capital Stack*

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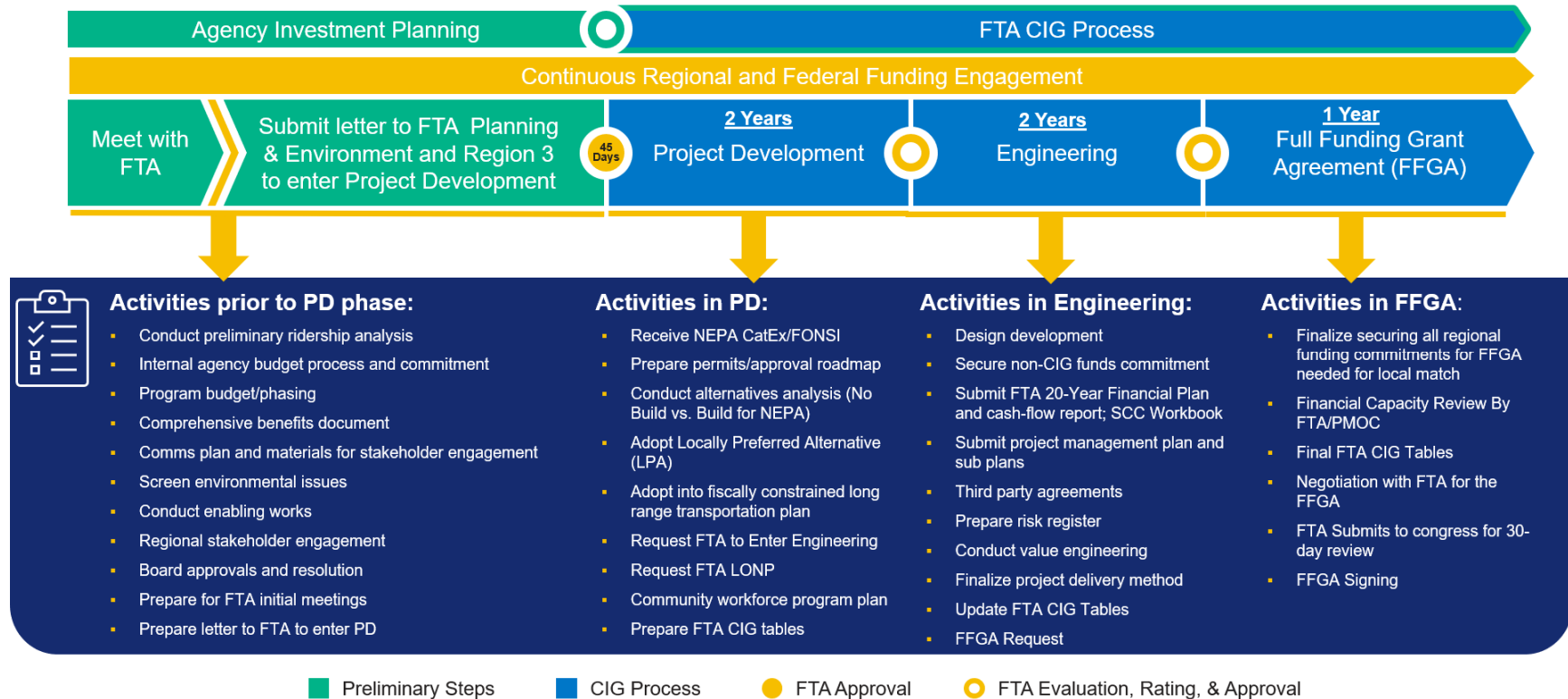


Figure 4 - Capital Investment Grant Process

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### Strategy Considerations:

- Total federal funds for any project type cannot exceed 80%
- The statutory funding match for local funds is 20-40%, but in practice, has been 50% or more
- Determine if the project is viable for CIG Project “bundling” (a new IJA program)
- Show strong financial capacity, health, and cash flow projections
- \$4.6 billion annual appropriation to FTA CIG (Sec 5309) that cycles down in four years
- Earn a “Medium” overall rating to get construction grant award
- If there is a Federal funding shortfall (e.g., receive less due to congressional appropriations), the full scope of the project needs to move forward. Provide evidence of financial capacity to provide additional non-federal funds (cash balances, additional debt capacity, additional funds from new or existing sources)
- FTA may waive the Build America Buy America (BABA) requirements for materials that increase project cost by 25% or more, based on new BABA administration rules in process.

### Blueprint Findings and Recommendations

The Blueprint indicates that all station locations support the BRT to HRT conversion, except SW 184th Street, which lacks sufficient tangent length for Metrorail platforms. Further review is required to determine if this station can be converted, relocated, or removed. Anticipated components needed at each station and key elements along the corridor is provided in **Table 5** of the final report. Several design considerations were examined in the Blueprint. A summary of the findings is included here:

- Existing BRT station canopies have adequate clearances for rail conversion.
- Platforms will need to be raised and lengthened.
- Power supply type (OCS preferred) and safety features must be determined.
- New maintenance facility and additional maintenance vehicles will be required.
- Overhead utility crossings and compatibility need a thorough review.

### Timeline and Next Steps

The FTA has indicated that the BRT currently under construction needs to operate for a minimum of a five year period before they will consider conversion to rail. Upon conclusion of this time period, the next step before consideration would be to perform a STOPS ridership model that would result in a competitive ranking in the FTA New Starts process, after which the following activities would be required:

- |                                   |         |
|-----------------------------------|---------|
| • Perform Pre-FTA Planning/NEPA   | 3 years |
| • Program Local Funding PTP (26%) | 2 years |
| • Secure FDOT funding             | 2 years |
| • FTA Project Development         | 2 years |
| • FTA Engineering Phase           | 2 years |

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- FTA Full Funding Grant Agreement 1 year
- Final Design and Construction 5 years
- Complete Rail Fleet Conversion 3 years
- Testing/Commissioning before Revenue Service 1 year

Early tasks include funding and financing considerations, as well as upfront planning tasks that include coordination with FTA, class of action determination, NEPA environmental review process, and stakeholder engagement.

Once the project moves to the design and engineering phase, additional evaluation will be needed to identify key pinch points and engineering challenges for major project elements, including alignment and stations, structures, fleet, and facilities. A more in-depth review of all existing infrastructure will be needed to identify where the existing corridor may not be able to support rail technology. A timeline for the conversion and fleet retrofitting process will also need to be developed with consideration for ongoing service during construction, and resources needed to support the conversion process itself. Conceptual engineering will result in initial designs and documentation for all project elements, including traction power, maintenance and storage facilities, local bus terminals, stations and station spacing, pedestrian connections, etc.

## Conclusion

Preliminary results from this study indicate that the South Dade TransitWay has the potential to be converted from BRT to HRT in the future, however there are several challenges and considerations that will need to be addressed as the project progresses. These include items such as platform height and length adjustments, electrical power considerations, and, as previously stated, the station at SW 184<sup>th</sup> street, which will require significant attention and re-working to accommodate the track geometry necessary for heavy rail vehicles. The long-term nature of the conversion process will require careful financial and logistical planning and additional in-depth engineering analysis ensure the conversion can be successfully implemented.