

# CSX Southwest Railroad Corridor Assessment

Executive Summary



Miami-Dade Transportation  
Planning Organization



Prepared by

**TRANSYSTEMS**

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# 1. Findings and Recommendations

The findings and recommendations of the CSX Southwest Railroad Corridor Assessment for further actions are summarized below:

## 1.1 Recommendations

The CSX Southwest Railroad Corridor is recommended to be incorporated into the Miami-Dade 2045 Long Range Transportation Plan (LRTP), Priority IV unfunded section, for future use as a shared freight/passenger rail corridor.

A corridor-wide land-use visioning initiative is recommended to evaluate transit supportive land-use policies that will provide increased mobility while expanding ridership and goods movement by freight service.

Interoperability between the different modes, including service, fare integration policies, balancing of ridership, and operational costs, should be coordinated in advance of implementing additional new passenger rail projects. This will result in significantly higher ridership system-wide across the region.

It is recommended that initiatives to preserve and/or expand corridor be identified and implemented as necessary

## 1.2 Findings

Joint freight and passenger rail services can be operated within the study corridor safely and efficiently provided infrastructure improvements are made in accordance with the findings of this study.

- Existing and expanded freight service can operate without significant impact with the implementation of passenger service.
- A suitable level of passenger rail service can be implemented to serve the mobility needs within the corridor.

All infrastructure and safety upgrades and investments required to operate passenger service will also serve freight operations.

- Initial service can be implemented as a single track with passing sidings level of infrastructure investment operating on 30/60-minute headways.
- A longer-term strategy will require full double track infrastructure to allow for more frequent service as the need arises based on corridor ridership.

Implementation of passenger service in the corridor will not significantly impact other corridor initiatives in the region including the South Dade TransitWay.

Access to CSX right-of-way will require some form of access agreement or outright purchase based on fair market value as noted in correspondence obtained from CSX dated July 24, 2023.

Providing higher frequency passenger service than 30-minute peak-period and 60 minute off peak-period requires double tracking the full corridor and a significantly larger fleet of trains.

## 2. Purpose and Alternatives

### 2.1 Purpose

This study was initiated by the Miami-Dade Transportation Planning Organization (TPO) to explore the possibility of establishing passenger rail service in the region. The primary study corridor runs southwestward from the Miami Intermodal Center (MIC), near the Miami International Airport (MIA), to the City of Homestead. Based on the insights gained from previous studies, TPO developed three alternatives to evaluate for joint passenger and freight rail service that could aid Miami-Dade County (MDC) with resiliency, congestion, goods movement and offer additional mobility options for residents and visitors.

### 2.2 Alternatives Evaluated

Building off several previous studies that evaluated all or parts of the CSX Homestead Subdivision for implementing transit service, the TPO identified three distinct variations of the corridor for further evaluation. All three corridors start at the MIC at the airport and extend to the south terminating at three different locations. A brief description of these variations is described below and graphically depicted on the following page.

**Alternative 1 Kendall Link** - Corridor connects the Kendall (SW 137th) area to Metrorail, Tri-Rail, and Miami International Airport, at the MIC. This alternative is a variation of an alternative evaluated as part of the Kendall Corridor Alternatives Analysis (Kendall Link Study).

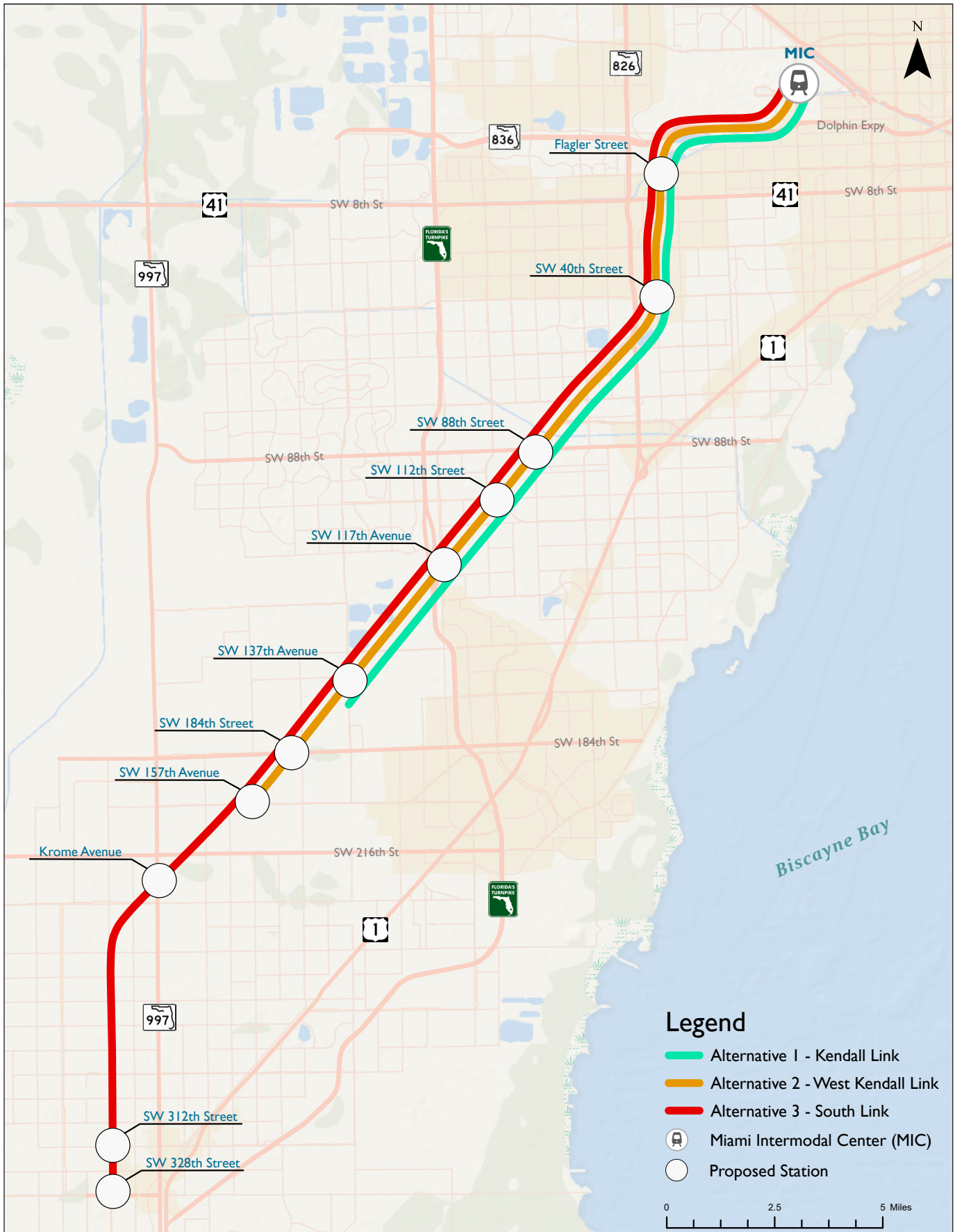
**Alternative 2 West Kendall Link** - Corridor connects the West Kendall (SW 157th) area to Metrorail, Tri-Rail, and Miami International Airport, at the MIC. This alternative is a variation of an alternative evaluated as part of the Kendall Corridor Alternatives Analysis (Kendall Link Study).

**Alternative 3 South Link** - Corridor connects Florida City/Homestead (SW 328th) to Metrorail, Tri-Rail, and Miami International Airport, at the MIC. This alternative was adapted for this study based on the South Corridor Alternatives Analysis (South Link Study).

The three alternatives are shown on Figure 1.



Figure 1: Alternatives Evaluated



### 3. Existing Conditions

Data collected for this study included key items such as population growth, land use, operating entities, railroad rights-of-way (ROW), and infrastructure components such as tracks, highway-rail at-grade crossings (HRGC), and structures (bridges) were analyzed to support informed decision-making and strategic planning regarding the three alternatives.

**Population** - MDC has experienced an eight percent (8%) population increase between 2010 to 2020, emphasizing the need for expanded transit options.

**Land Use** - MDC has evolved from an agricultural area to a densely populated residential metropolis with high-density commercial and employment centers found along the rail corridor.

**Operating Entities** -The study illustrates that both State-operated and CSX-owned tracks extend from the MIC to the City of Homestead.

**Railroad ROW** - The width of available right-of-way varies, with urban areas having less room to work with, impacting potential project concepts and designs.

**Infrastructure** – Tracks, HRGCs, and structures were derived for the study:

- A single set of tracks classified as “Excepted,” permitting low-speed freight operations exist but will require upgrades to accommodate passenger rail
- There are 83 open HRGCs within the study corridor, presenting potential conflict points and opportunities for enhancing safety
- Structures were identified (bridges, culverts, and overpasses) which may impose height or weight restrictions for passenger rail vehicles

**Existing Rail Freight Movements** - The analysis of a freight rail corridor for a potential shared use investment with passenger rail must consider the existing freight movements and future considerations are as follows:

- For this study it was determined that two daily round trip freight trains are in operation and for planning purposes a doubling of freight movements was assumed
- The corridor is currently considered a “dark territory,” which means it lacks signal control and relies on track warrants and train dispatchers for managing movements.



## 4. Alternatives Analysis

This study builds off several planning efforts that analyzed the potential to introduce commuter rail, light rail, or bus rapid transit to underutilized freight rail corridors in the southwest area of the County. These studies include the Kendall Corridor Transportation Alternatives Analysis (2007) and the CSX East-West Rail Feasibility Study (2016). A Service Plan Validation was used to develop three service plans for potential future passenger rail service along the CSX Homestead subdivision, which connects the MIC at the northern end of the corridor with the City of Homestead at the southern end. The service planning assumptions and approach were as follows:

### Freight Operations

- Two freight rail trains, round trip, per day
  - One travels down the Lehigh Spur (westward)
  - One travels down Homestead Subdivision towards Sterling Junction (south westward)
- Trains carry approximately 20-30 cars
- No service south of SW 152nd Street
- Freight operations were assumed to be during off-peak periods

### Passenger Operations

- Operating hours are 5:30 AM to 11:00 PM
- Assumed service will have 30 minute headways during peak morning (6:00 AM to 9:00 AM) and evening travel (3:00 PM to 7:00 PM)
- All other times headways will be 60 minutes
- Rolling stock assumed to be a push-pull consist with one diesel locomotive and two bilevel coaches and one bilevel cab car, like what is currently operated by Tri-Rail (Figure 2)
- Assumed maximum operating speed for passenger trains is 60-mph, provided the number of stations and grade crossings along the corridor actual average operating speed is in the range of 30-mph.
- New passenger services could use the CSX Hialeah Yard for maintenance and storage of vehicles, which is also currently utilized for those functions by Tri-Rail and Amtrak

**Figure 2: Tri-Rail Unpowered Bilevel Cab Car**



**Alternative Run Times** - For each alternative, the total mileage, and end to end travel time, are shown in Table 1.

**Table 1: Mileage and Travel Time**

Metric	Alternative 1 Kendall Link	Alternative 2 West Kendall Link	Alternative 3 South Link
Total Mileage	18	21.5	30.5
End to End Travel Time (Minutes)	36	44	57

## 5. Ridership Forecasts

This section provides preliminary ridership forecasts for the alternatives using the Federal Transit Administration’s (FTA) Simplified-Trips-on-Project Software (STOPS), a computer program that predicts transit travel patterns for specific scenarios. The STOPS model used in this analysis was calibrated for the region and has a base year of 2019 and a horizon year of 2045, serving as the basis for ridership forecasting for the SMART Plan corridors. The results are presented in terms of daily boardings.

**Ridership Forecasts** - the 2045 trips projected by alternative are summarized in Table 2:

**Table 2: 2045 Station Level Boarding Forecasts**

Metric	Alternative 1 Kendall Link	Alternative 2 West Kendall Link	Alternative 3 South Link
Daily Trips Base Alternative (30/60)	2,700	3,000	3,800

**Sensitivity Tests** - The sensitivity of ridership forecasts to transfer fares and improved service frequency were evaluated as part of this effort to provide stakeholders with an understanding of how specific changes in fare policy and/or service frequency could impact ridership. The project team performed an analysis to determine the potential increase in ridership over the base projection show in the above tables under two scenarios:

- Increasing the frequency from 30/60 (peak/off-peak) to 15/30 is expected to increase the trips on project by about 55 percent. This increase in operations requires a full double tracking of the corridor.
- Changing the transfer fares (integrated fares) to allow for free transfers between all Miami-Dade Transit modes and the project results in an increase in the trips on project by about 80 percent.

Table 3 provides the results of the sensitivity tests on each alternative evaluated.

**Table 3: 2045 Key Ridership Forecasting Metrics with Sensitivity Test Applied**

Metric	Alternative 1 Kendall Link	Alternative 2 West Kendall Link	Alternative 3 South Link
Daily Trips Base Alternative (30/60)	2,700	3,000	3,800
Daily Trips with increased frequency (15/30)	4,200	4,700	5,800
Daily Trips with integrated fares (interoperability)	4,900	5,500	6,800

## 6. Infrastructure Requirements and Costs

As noted previously the existing infrastructure is not in a condition to meet required federal railroad standards for passenger rail operations and as such requires a significant upgrade to provide safe and efficient operations. Based on the assessment of existing infrastructure and the need to bring that infrastructure to meet current Federal Railroad Administration (FRA) requirements the following investments will be necessary:

### Infrastructure Needs

- Track replacement or renewal to meet FRA Class 3- which allows for a maximum of 60 mph although average speeds are in the 30-mph range
- Track undercut, ballast renewal, and track surfacing
- Construction of missing track segment linking the spur to the MIC
- Station and siding track installation
- Potential upgrades to existing Hialeah Yard
- Installation of Centralized Traffic Control (CTC) signal system reinforced with Positive Train Control system
- All bridges reconstructed to allow for safe operation
- New stations with low boarding passenger platforms and mini-high platforms
- All grade crossings to be brought up to current standards with modern equipment and deployment of necessary infrastructure for “quiet zones” in possible
- New rolling stock (train sets) to meet operational demands

The preliminary estimates of the capital costs have been developed in general accordance with Federal Transit Administration (FTA) guidelines for estimating capital costs. Part of the FTA’s guidelines call for cost estimates to be prepared and reported using the latest revision for the FTA’s Standard Cost Categories (SCC). These cost categories form the basis for the format and structure that were used for the conceptual capital cost detail and summary sheets developed for this project. FTA’s Capital Cost Database (CCD) was utilized to obtain historical costs reported in the database, this data was supplemented by planning level costs that have been utilized on recent projects in the greater Miami-Dade region. The unit costs are shown in 2023 dollars.

In accordance with the latest version of the FTA’s SCC, the capital cost components for each proposed expansion project are be classified into the following cost categories:

### Capital Costs Components

- 10 Guideway and Track Elements
- 20 Station, Stops, Terminals, Intermodal
- 30 Support Facilities: Yards, Shops, and Administration Buildings
- 40 Sitework and Special Conditions
- 50 Systems
- 60 Right-of-Way (ROW), Land, Existing Improvements
- 70 Vehicles
- 80 Professional Services
- 90 Unallocated Contingency
- 100 Finance Charges

These preliminary capital cost estimates do not include:

- Right-of-way access costs/access fees
- Property acquisition
- Financing expenses

Table 4 depicts the anticipated capital cost for each alternative represented in 2023 dollars.

**Table 4: Planning Level Capital Cost by Alternative**

Single Track w/Sidings 30/60 min. Service plan	Alternative 1 Kendall Link	Alternative 2 West Kendall Link	Alternative 3 South Link
Planning Level Capital Costs	\$640 - \$720 Million	\$731 - \$860 Million	\$1.07 - \$1.2 Billion
Double Track 15/30 min. Service plan	Alternative 1 Kendall Link	Alternative 2 West Kendall Link	Alternative 3 South Link
Planning Level Capital Costs	\$900 Million - \$1.1 Billion	\$1.1 - \$1.3 Billion	\$1.65 - \$1.8 Billion

Table 4 demonstrates the capital cost implications of operating a high frequency service. The need for double track infrastructure combined with the for more trainsets significantly increases the cost, the benefit of additional ridership gained verses the added expense needs to be carefully evaluated.

**Annual Operating and Maintenance Costs**

To develop planning level annual O&M costs for the various alternatives baseline data was obtained from the 2021 National Transit Database (NTD). The data extracted from the NTD was used to develop average cost per vehicle revenue hour for similar commuter rail operations in Florida. Specifically, comparable systems utilized for the analysis include the SFRTA for the Tri-Trail operations and the Central Florida Commuter Rail for the SunRail operations. These two systems were determined to best represent the operating parameters being evaluated in this analysis.

Once comparable operations were identified average costs were developed for application to the three alternatives under study. Utilizing the service plans developed and the average O&M costs identified costs for the various alternatives were developed as shown on Table 5. A range of costs have been presented to be conservative given the level of planning associated with this evaluation.

**Table 5: Planning Level O&M Costs by Alternative (in 2023 Dollars)**

	Alternative 1 Kendall Link	Alternative 2 West Kendall Link	Alternative 3 South Link
Annual Revenue Hours	10,000 - 10,500	12,000 - 13,000	15,000 - 16,500
Cost Per Revenue Hour	\$1,700	\$1,700	\$1,700
Annual O&M Cost	\$17 - \$18 Million	\$21 - \$22 Million	\$27 - \$28 Million

## 7. Next Steps

This initial planning level analysis was performed to determine the merits of a strategy involving the implementation of a shared freight and passenger rail within the corridor. While this initial review reveals promise for such use of the corridor further steps remain in the project development process. Next steps include:

- Incorporating the corridor into the current adopted Miami-Dade TPO's 2045 Long Range Transportation Plan (LRTP) Priority IV unfunded section for future use as a shared freight/passenger corridor.
- Undertaking a land use visioning initiative to evaluate transit supportive land use policies along the corridor to provide for increased transit ridership and goods movement by freight service.
- Continue to work with Stakeholder Groups including CSX to refine the strategy for and needs of the corridor.
- At the appropriate time advance the corridor initiative through FDOT's Transit Concept and Alternatives Review (TCAR) process.
- Develop a financial strategy for project development and implementation.



# Appendix



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November 1, 2023

**VIA E-MAIL**

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Re: CSX Railroad Corridor Assessment

Thank you for including CSX in your planning efforts. Given the time limitations and early stages of the project, CSX recommends to use a streamlined approach to evaluate the potential infrastructure required to support the introduction of commuter trains on the Homestead Sub.

As you know the entire subdivision is “excepted track”. This means that as of today passenger trains are not allowed to operate and no Positive Train Control (“PTC”) is installed. Before initiating any new commuter operation, in compliance with FRA regulations, new tracks and additional capacity will need to be constructed including installing a PTC system.

It is CSX’s recommendation to complete the study using, as a template, the same infrastructure characteristics that have been constructed and in service on the SFRC where TriRail operates its commuter service between West Palm Beach and Miami. The CSX trains that operate on the Homestead Sub also operate on the SFRC to reach Hialeah Yard. Providing the same capacity that is available on the SFRC should be sufficient to operate both freight and passenger trains on the Homestead Sub. The same engineering standards for track (including speed, weight, vertical and horizontal clearances, etc.), signals and PTC available on the SFRC should be planned on this new corridor.

CSX recommends that stations be designed using the same standards as those facilities on the SFRC.

As far as train counts and specs, SFRTA can provide the data since CSX trains operating on the Homestead Sub originate and terminate on the SFRC in Hialeah Yard.

At this point, given the uncertainties of any such transaction, CSX has not decided whether to entertain a deal involving the introduction of commuter passenger trains onto the Homestead

Sub, but, if in fact the project progresses, one of CSX's requirements will be fair market value compensation for the property necessary for the project and capacity that such new service would utilize.

Another major element of any potential transaction would also be indemnification protection against new liabilities associated with the introduction and operation of this new service. While the current agreement with FDOT for the SFRC provides an acceptable framework, there are several provisions that would need to be renegotiated to incorporate the potential new service. There are obviously other significant issues which any transaction would have to address in a satisfactory manner for CSX to consider progressing the introduction of commuter trains on the Homestead Sub, but I wanted to highlight these two large issues for your awareness.

Please let us know if you have additional questions.

Sincerely,

*Marco Turra*



**Miami-Dade Transportation  
Planning Organization**