New River Crossing Feasibility Technical Memorandum

Project Development & Environment (PD&E) Study Services for Tri-Rail Coastal Link (TRCL)
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1.0 EXECUTIVE SUMMARY

1.1 Introduction

In response to Legislative Specific Appropriation 1939 passed in July 2019, an evaluation was initiated by the Florida Department of Transportation (FDOT), District 4, to study the feasibility of new crossing alternatives at the New River to provide a solution which will meet reasonable needs of navigation, freight trains, and passenger trains within the crossing area. There is an existing rail bascule bridge spanning the New River within the existing Florida East Coast (FEC) right of way, currently used by freight and passenger trains, which are operated by FEC and Virgin Trains/Brightline, respectively.

1.2 Objective

The objective of the study is to evaluate the feasibility of a rail crossing at the New River to provide a solution which will meet reasonable needs of navigation, freight trains, and passenger trains within the crossing area. This study includes the evaluation of several crossing alternatives including movable bridges of various vertical clearances, a fixed bridge, and tunnel concepts to identify feasible alternatives that could be advanced into the Project Development and Environment (PD&E) Study phase.

1.3 Study Area

The limits of this study run parallel to Andrews Avenue and FEC Railway Corridor from approximately SR 838/Sunrise Boulevard (northern terminus) to SW 15th Street (southern terminus). The total length of the study is approximately 2.5 miles (refer to **Figure 1**).

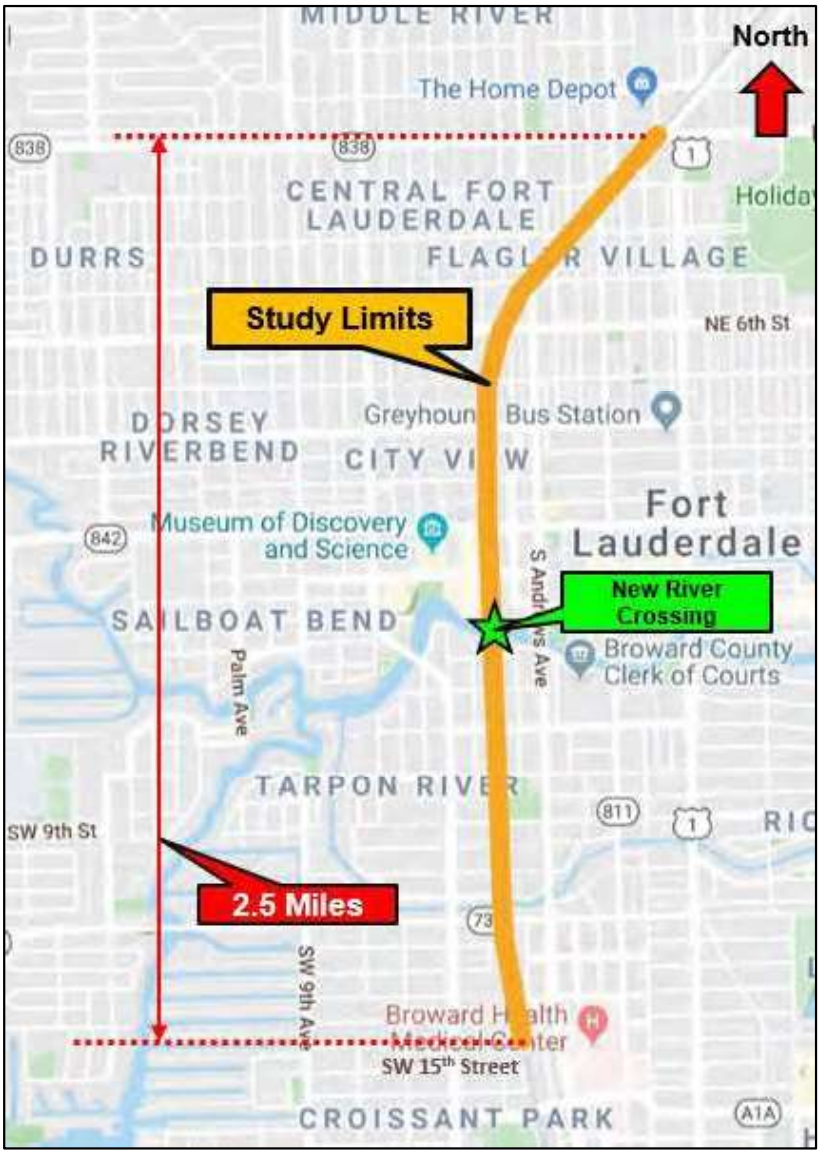

Figure 1: Location Map

1.4 Context and Background

The New River Crossing Feasibility Study is a continuation of the Tri-Rail Coastal Link (TRCL) Transit Analysis Study. As part of Legislative Specific Appropriation 1939, the legislation identifies the utilization of resources from the State Transportation Trust Fund that allows the FDOT to update the Tri-Rail Coast Link Study (formerly known as the South Florida East Coast Corridor Transit Study) Phase 2 Navigable Waterway Analysis Technical Memorandum (see **Appendix A**).

1.5 Conceptual Alternatives

Four crossing alternatives were evaluated as part of this study. Track horizontal and vertical alignments, typical sections, navigational clearances, structural analysis, environmental impacts, and constructability were evaluated in the development of the preliminary concept alternatives for further development and analysis during the PD&E phase and subsequent phases.

The alternatives evaluated are listed below:

- **Alternative 1** - Low-Level Bascule Bridge (21-foot clearance)
- **Alternative 2** - Mid-Level Bascule Bridge (56.5-foot clearance)
- **Alternative 3** - High-Level Fixed Bridge (80-foot clearance)
- **Alternative 4** - Tunnel (5-foot clearance below the riverbed; proposed track depth of 63-feet below existing track grade; total depth to bottom of bored tunnel is 75-feet below the existing track)

Figure 2 provides a schematic comparison between the different alternatives. The Low-Level Bascule Bridge Alternative requires approximately 1.1 miles of overall improvements which includes a new bascule bridge structure at the New River, and track work needed to re-establish track connections to existing railroad tracks on both the north and south side of proposed improvements. The Mid-Level Bascule Bridge, High-Level Fixed Bridge, and Tunnel alternatives require approximately 2.5 miles of overall improvements. The structural configurations differ between these alternatives, however, due to design constraints, and geometric needs based on design criteria, the overall length of track improvements are similar. All four alternatives would also re-establish connections to existing railroad tracks on both the north and south side of the proposed improvements. The following sections provide additional details regarding each alternative.

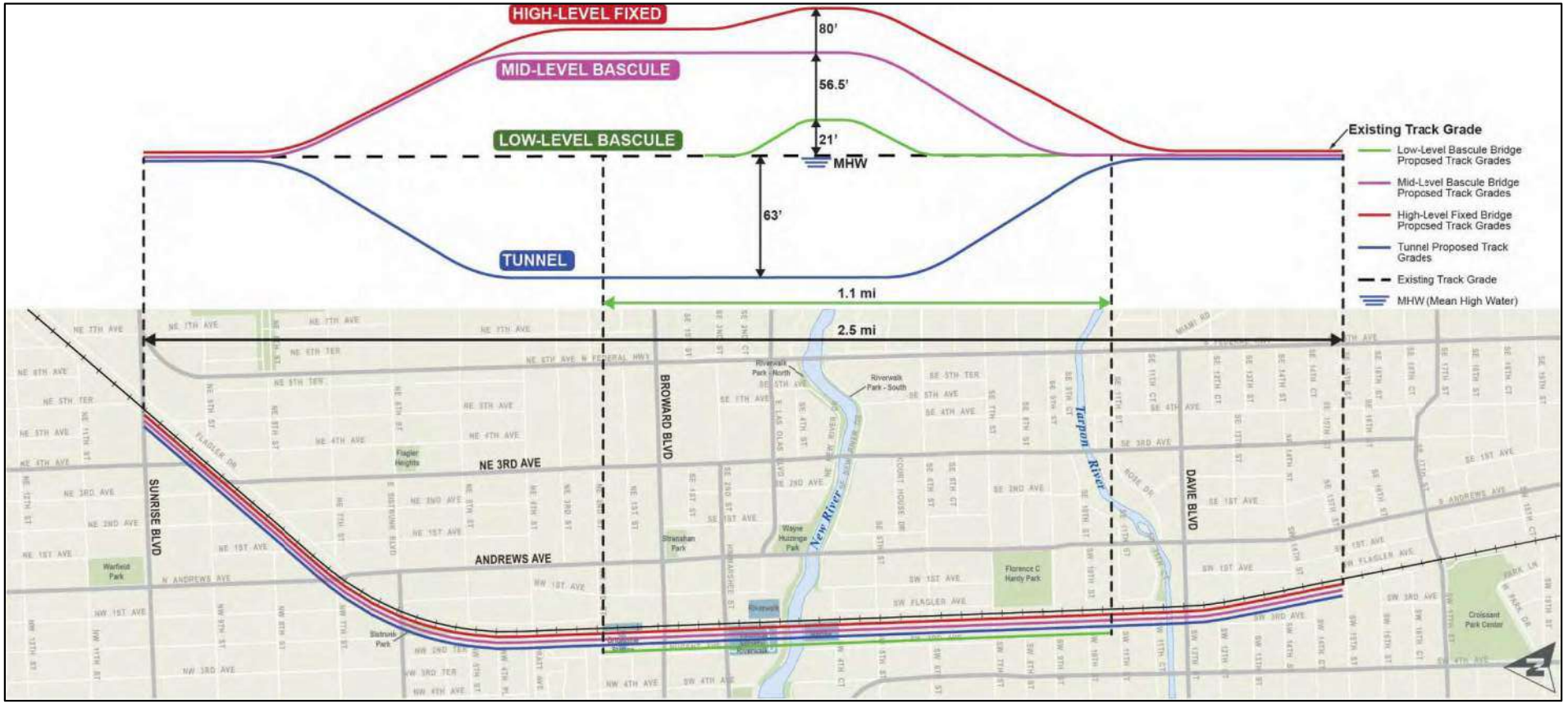

Figure 2: Overview of Alternatives (Schematic)

1.6 Stakeholder Coordination

Stakeholder coordination meetings were conducted throughout the duration of the study to introduce the project and receive input during the evaluation process. In general, the stakeholders support a new rail crossing of the New River. Meeting notes are included in **Appendix B**. **Table 1** shows the stakeholder meetings that were conducted between August 2019 and December 2019.

Table 1: Stakeholder Meeting Log

Stakeholder	Date/Time	Location
Virgin Trains (Brightline)	August 14th, 2019 1:30 PM	8075 Gate Parkway W, Suite 204 Jacksonville, FL 32216
United States Coast Guard (USCG) District 7	October 11, 2019 10:00 AM	909 SE 1st Avenue #510 Miami, FL 33131
Marine Industries Association of South Florida	October 15th, 2019 11:00 AM	221 SW 3rd Avenue Fort Lauderdale, FL 33312
Florida East Coast Railway (FEC)	October 25th,2019 11:00 AM	7150 Philips Hwy Jacksonville, FL 32256
Marine Advisory Board – City of Fort Lauderdale	November 7th, 2019 6:00 PM	100 N Andrews Avenue, 8th Floor Fort Lauderdale, FL 33301
City of Fort Lauderdale & Downtown Development Authority	November 14th, 2019 1:00 PM	290 NE 3rd Avenue Fort Lauderdale, FL 33301
Broward County	November 14th, 2019 4:00 PM	115 South Andrews Avenue, Suite 409G Fort Lauderdale, FL 33301
Marine Industries Association of South Florida	December 5th, 2019 10:30 AM	221 SW 3rd Avenue Fort Lauderdale, FL 33312
Marine Advisory Board – City of Fort Lauderdale	December 5th, 2019 5:30 PM	100 N Andrews Avenue, 8th Floor Fort Lauderdale, FL 33301
Broward County	December 6th, 2019 9:00 AM	115 South Andrews Avenue, Suite 409G Fort Lauderdale, FL 33301
City of Fort Lauderdale & Downtown Development Authority	December 10th, 2019 11:00 AM	290 NE 3rd Avenue Fort Lauderdale, FL 33301
Broward Metropolitan Planning Organization (MPO)	December 13th, 2019 1:30 PM	100 West Cypress Creek Rd., Suite 650 Fort Lauderdale, FL 33309

1.7 Analysis Results

In summary, all alternatives are considered feasible. A preliminary right of way impact assessment, environmental screening, constructability review, and cost estimate were conducted as part of this study. In addition, a high-level qualitative analysis was conducted to compare the feasibility of the alternatives. The summary of the qualitative analysis is presented in **Section 9.5**, **Table 17** of this report.

1.7.1 Right of Way Needs

Alternative 1 impacts seven parcels with a total impact area of 0.78 acres. Alternative 2 impacts 56 parcels with a total impact area of 6.81 acres. Alternative 3 impacts 65 parcels with a total impact area of 7.09 acres. Alternative 4 impacts 68 parcels with a total impact area of 8.16 acres, however, there are additional subterranean impacts that would need to be considered in the evaluation of the total impacts. **Table 2** lists the acreage impacted with each alternative.

Table 2: Right of Way Impacts Summary

Alternative	Parcels Impacted (Acres)
Alternative 1 Low-Level Bascule Bridge	0.78
Alternative 2 Mid-Level Bascule Bridge	6.81
Alternative 3 High-Level Fixed Bridge	7.09
Alternative 4 Tunnel	8.16

1.7.2 Environmental Considerations

Several potential cultural resources were identified within the study area. Those include potential Section 4(f) and Section 106 properties that may be publicly owned parks, recreational lands, wildlife and waterfowl refuge areas, or historic sites of national, state, or local significance.

Potential Section 4(f) resources:

- Sistrunk Park
- Riverwalk Linear Park
- Florence C. Hardy & Southside Park
- Tarpon River Park, Esplanade (Discovery) Park
- Bubier Park/Huizenga Plaza
- Marshall Point

Potential historic and archeological resources:

- Sears Town, Progress Plaza (8BD0176)
- Broward Plasma Corp./Archaeology Museum (8BD01330)
- Tom M. Bryan Building (8BD00227)
- King-Cromartie House (8BD00062)
- New River Inn (8BD00063)
- Philemon Bryan House (8BD00212)
- Antique Car Museum
- Himmarshee Street/SW 2nd Avenue Historic District (H-1)
- Fort Lauderdale Historic District (8BD181)
- Brickell Block (8BD02916)

Section 9.2 of this report discusses the location of the cultural resources with respect to the footprint of the alternatives. For Section 4(f) resources, the Determination of Applicability (DOA) will be made during the PD&E phase to determine as to whether Section 4(f) does or does not apply to the project and if the project is eligible for exceptions, exemptions, and exclusions to a Section 4(f) requirement. The PD&E phase will also initiate the Section 106 process by establishing the undertaking, conducting consultation, identifying historic properties, assessing adverse effects, and resolving adverse effects by avoiding, minimizing, or mitigating. A Cultural Resource Assessment Survey (CRAS) will need to be developed during the PD&E phase.

1.7.3 Constructability

A constructability review is a process that reviews and ensures that a project is buildable, while also being cost-effective, biddable, and maintainable. It is important to note that a constructability review in the early stages of a project has the best potential for providing meaningful benefits without having an adverse effect on project schedules. Conducting constructability reviews early and consistently throughout the project's life can also avoid potential project delays, increased costs, construction claims, and delays and/or disruptions to the public. As part of this study, construction factors were considered during the development of the alternatives. This includes identification of potential challenges, fatal flaws, assumptions, sequencing, temporary conditions, etc. In summary, all alternatives are considered constructible during this phase of the project. Additional constructability reviews will be needed during the PD&E and subsequent phases to ensure the project is buildable and biddable.

1.7.4 Cost Estimate

A preliminary order of magnitude cost estimate was developed for each alternative. Cost components associated with improvements include bridge structures, track, tunnel, stations, roadway, sitework, special conditions, rail signals/communications, construction, right of way, professional services, and operations & maintenance (O&M). Table 3 shows the preliminary costs associated with each alternative.

Table 3: Preliminary Cost Estimate

Construction Costs	Alternative 1 Low Level Bascule Bridge (21 feet)	Alternative 2 Mid-Level Bascule Bridge (55 feet)	Alternative 3 High-Level Fixed Bridge (80 Feet)	Alternative 4 Tunnel
Structures	$50,170,640	$214,940,440	$245,477,908	$1,714,960
Track	$12,074,010	$15,402,114	$15,402,114	$15,409,030
Tunnel (including track, ventilation, emergency evacuation, fire suppression)	N/A	N/A	N/A	$2,315,256,047
Stations	N/A	$23,378,228	$23,378,228	$49,632,656
Roadway	$399,100	$2,772,900	$2,772,900	$1,078,350
Sitework and Special Conditions	$3,182,362	$10,207,549	$9,962,674	$8,909,927
Utility Relocation Allowance	$1,000,000	$2,800,000	$3,100,000	$8,000,000
Rail Signals/ Communications	$16,587,901	$17,430,183	$16,191,787	$17,357,371
Construction Cost	$83,414,013	$286,931,414	$316,285,611	$2,417,358,341
Right of Way Costs	$21,100,000	$54,200,000	$48,600,000	$53,400,000
Professional Services	$29,820,510	$102,577,980	$113,072,106	$864,205,607
Total Project Costs	**$134,334,523**	**$443,709,394**	**$477,957,717**	**$3,334,963,948**
Operations and Maintenance Cost ($/Year)	**$1,900,000**	**$3,300,000**	**2,400,000**	**$8,200,000**

1.8 Conclusion

1.8.1 Conclusions

The following are the consensus of the conclusions reached by the FDOT as part of this study:

- All alternatives were determined to be feasible and should be further developed and evaluated in the PD&E phase.
- Potential Section 4(f) and Section 106 resources will need to be further evaluated in the PD&E phase. At this time, this study did not determine a fatal flaw, however, additional coordination with the FDOT, FTA, stakeholders, and consultation parties will be needed as part of the PD&E study to provide appropriate documentation of identified environmental resources and whether there any adverse effects to environmental resources.
- Appropriate level of documentation to meet NEPA requirements will be on going and will be part of the PD&E phase.
- An in-depth traffic analysis should be conducted as part of the PD&E study to determine how local Downtown Fort Lauderdale traffic will be impacted by the various bridge crossing alternatives.
- A vessel survey update will need to be conducted as part of the PD&E study.
- A benefit cost analysis should be conducted as part of the PD&E phase to determine the life cycle benefits to the initial capital cost investment of the project.

1.8.2 Additional Considerations

Prior to initiation of a PD&E study, an agreement between the railroad owner and the public sector for public access and use of the rail corridor is required. The potential for the addition of a freight track to the east of the existing freight track alignment, and a review of the remaining lifespan of the existing freight bascule bridge should be considered. This will allow for an environmental assessment (PD&E) to minimize right of way impacts and costs, business damages and potential relocations, access impacts within the immediate river crossing vicinity, impacts to recreational or historic properties (Section 4(f) & Section 106) and potentially extend the life cycle of the existing freight bascule bridge. This study identified additional options that should be considered as part of the PD&E phase.

Option 1:

To achieve a shorter construction duration impact on freight and passenger operations, the existing bascule bridge could be relocated to the east within the railroad right of way with the construction of new foundations and a lifting and resetting of the existing bascule bridge mechanical equipment and bridge deck. This will allow 13 to 15 feet of additional horizontal distance for the construction of any of the bridge alternatives examined in this study.

Option 2:

A second option would be the addition of a new freight track to the east of the existing Track 2, and re-construction of the bascule bridge, thereby reducing the footprint of the new bascule bridge serving freight operations. This allows for additional horizontal space to locate the new passenger tracks and bridge structures within the existing right of way. This additional right of way will potentially allow the proposed Low-Level Bascule Bridge alternative 5 to 11 feet of additional space for improvements, resulting in minimal impact to the existing angle parking on SW 2nd Avenue, and maintain access to the businesses and Historic Society buildings north of the river and have no impacts to the existing boat storage facility on the river's south bank. For the Mid-Level Bascule Bridge and High-Level Fixed Bridge alternatives, the new freight track will provide additional right of way to construct the foundations and support columns for the bridge alternatives and will maximize the use of the existing right of way while minimizing impacts to parking along SW 2nd Avenue north of the river.

The limits of the additional freight track to the east of the existing freight Track 2, will be consistent with the limits of the track impacts identified for each of the bridge alternatives. These limits range from approximately 5,740 feet (1.1 mile) for the Low-Level Bascule Bridge alternative to approximately 13,215 feet (2.5 miles) for the Mid-Level Bascule and High-Level Fixed Bridge alternatives.