



The Florida Department of Transportation (FDOT), District Four, and Broward County would like to welcome you to the alternatives public workshop for the Broward Commuter Rail Project Development and Environment Study, or PD&E Study. The objective of this PD&E study is to evaluate a regional rail transit system to expand existing passenger rail service, relieve I-95 congestion, improve connectivity and transportation choices, foster economic development, and promote sustainable land use through a transit-oriented development.

The Florida Department of Transportation is required to comply with various non-discrimination laws and regulations, including Title VI of the Civil Rights Act of 1964. Public participation is solicited without regard to race, color, national origin, age, sex, religion, disability, or family status.

Persons wishing to express their concerns about Title VI may do so by contacting either:

**District Four - Florida Department of Transportation  
Title VI Coordinator**

**Sharon SinghHagyan**

3400 West Commercial Boulevard  
Fort Lauderdale, Florida 33309-3421  
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or

**Tallahassee Office - Florida Department of  
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All inquiries or complaints will be handled according to FDOT procedure and in a prompt and courteous manner.

FDOT is required to comply with various nondiscrimination laws and regulations, including Title VI of the Civil Rights Act of 1964. This meeting is being held to give all interested persons the right to understand the project and comment on their concerns to the Department.

Public Participation at this meeting is solicited without regard to race, color, national origin, age, sex, religion, disability or family status.

Persons wishing to express concerns about Title VI may do so by contacting either the FDOT, District Four Title VI Coordinator or the FDOT Statewide Title VI Coordinator. The contact information for these officials are shown on the screen as well as on the project website.

## Purpose of Tonight's Meeting

- ❑ Share information with the public
- ❑ Serves as an official forum to review the maps, drawings, and other information about the project
- ❑ Provide an opportunity for public input
  - All public comments will become part of the project's public record
- ❑ Public input will be considered as part of the New River Crossing Alternatives evaluation
- ❑ Following the workshop, the team will make a recommendation for the Broward County Commissioners and the Broward Metropolitan Planning Organization (MPO) to vote on a Locally Preferred Alternative (LPA) for evaluation and comparison with the No-Build Alternative in the Federal Transit Administration (FTA) National Environmental Policy Act (NEPA) process



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The purpose of this workshop is to share information with the public about the PD&E Study and present the initial study results to date regarding the alternatives being considered.

This workshop also serves as an official forum for the public to express their comments and questions regarding the project. All public comments will become part of the project's public record.

This workshop is being conducted as an information gathering and sharing meeting. Public input will be a part of the BCR Corridor evaluation and the New River Crossing Alternatives analysis. The team will make a recommendation to the Broward County Commissioners and Metropolitan Planning Organization to vote on a Locally Preferred Alternative or LPA. The LPA will subsequently be evaluated versus the No-Build Alternative during the Federal Transit Administration's National Environmental Policy Act process.



## WHAT IS A PD&E STUDY?

A Project Development and Environment (PD&E) Study is FDOT's procedure for complying with the National Environmental Policy Act (NEPA) of 1969, and associated federal and state laws and regulations. During this phase, FDOT performs preliminary engineering, evaluates the projects impacts to the social, cultural, natural, and physical environments, completes interagency coordination, and engages the public. Public involvement is a key aspect throughout the life of a project. The objective of a PD&E Study is to support decisions concerning if, where, and what should be built to address the identified transportation needs.

## WHY IT'S DONE:

- Evaluate project feasibility, alternatives, and potential environmental impacts (natural, physical, social, and cultural)
- Comply with federal (NEPA) and state environmental laws
- Required to secure federal regulatory approval and funding

## WHAT IT INVOLVES:

- Conducting preliminary engineering
- Evaluating alternatives that meet the Purpose and Need while enhancing, avoiding, minimizing, or mitigating potential environmental impacts
- Coordinating with stakeholders, federal, state, and local agencies
- Engaging the public in evaluation of the alternatives
- Select a Locally Preferred Alternative (LPA) that will move forward with the Federal Transit Administration NEPA Process.

The transportation development process includes:

- Planning
- PD&E Study
- Final Design and Engineering
- Right of Way Acquisition
- Construction and
- Operations and Maintenance

A PD&E Study is the second phase of the transportation development process that FDOT follows to ensure that consideration is given to environmental impacts, social impacts, public input, engineering design, and project costs when evaluating a planned transportation improvement project. The general process includes data collection, rail operations, ridership and traffic forecasts, alternatives development, engineering and environmental analyses, and documentation.

A PD&E Study is required to satisfy the National Environmental Policy Act requirements.



## Project Overview

- ❑ Aventura to Deerfield Beach (27 miles of the FEC corridor)
- ❑ Technical recommendations have been made for 6 general station locations in Broward County
- ❑ Coordination with Brightline, FECR, USCG, FTA, MPO, municipalities, Broward and Miami-Dade Counties
- ❑ Stakeholder meetings and workshop focused on the New River Crossing and stations
- ❑ Miami-Dade has advanced the NE Corridor Project from Aventura to Downtown Miami with FTA
- ❑ Per Memorandum of Understanding (MOU)
  - FDOT will lead the environmental study and technical analysis
  - Broward County is responsible for the access fee, maintenance, operations, Finance Plan and Consensus Building



The Broward Commuter Rail project limits extend from Aventura in Miami-Dade County to Deerfield Beach in Broward County a distance of approximately 27 miles along the FEC Railroad. Technical recommendations have been made for six station locations in Broward County.

The PD&E Study includes ongoing coordination with Brightline, US Coast Guard, Federal Transit Administration, Metropolitan Planning Organization, municipalities, Broward and Miami-Dade county. Numerous stakeholder meetings and workshops have been held and were focused on the New River Crossing and proposed station locations.

Miami-Dade has advanced the Northeast Corridor Project from Aventura to Downtown Miami with Federal Transit Administration. Per the BCR, Memorandum of Understanding FDOT is leading the environmental study and technical analysis. Broward County is responsible for the access fee, maintenance and operations, Finance Plan and Consensus Building.

### □ Purpose

- The purpose of the BCR PD&E Study is to address congestion issues and to support economic as well as land development policies in eastern Broward County by improving mobility.

### □ Primary Needs

- Increase north-south travel opportunities
- Accommodate existing and future population growth
- Encourage sustainable land use and economic development

### □ Secondary Needs

- Enhance intermodal connectivity
- Improve transit service to high density travel market
- Preserve and enhance the environment and safety



The purpose of the Broward Commuter Rail PD&E Study is to address congestion issues and to support economic and land development policies in eastern Broward County by improving mobility.

The primary needs for the project are to increase north-south travel opportunities, accommodate existing and future population growth, and encourage sustainable land use and economic development.

The secondary needs for the project are to enhance intermodal connectivity, improve transit service to high density travel markets, and preserve and enhance the environment and safety.

## ECONOMIC & RESIDENTIAL GROWTH



- ❑ Transit Oriented Development (TOD)
  - Increase business investment
  - Increase tax base
  - Incentive to affordable housing

## ENHANCE QUALITY OF LIFE



- ❑ Increased mobility and transportation choices
- ❑ Greater access to employment, education, and essential services

## TRANSIT INCENTIVES TO THE PUBLIC



- ❑ Reduces travel times and provides more reliable commute times
- ❑ Save money on gas, parking, and car maintenance/repairs
- ❑ Increased ridership leads to a reduction in traffic and less need for additional travel lanes

## ENVIRONMENTAL



- ❑ Cleaner air by reducing traffic congestion and greenhouse gas emissions

## COMMUTER RAIL BENEFITS EMPLOYERS



- ❑ Access to a wider pool of talent
- ❑ Dependable and reliable transit service may boost and enhance productivity

Commuter rail has many important benefits. It spurs economic and residential growth including Transit Oriented Development, which increases investment and the tax base. It is an incentive to affordable housing. Commuter rail helps to enhance quality of life by increasing mobility and transportation choices and providing greater access to employment, education, and essential services.

Transit benefits to the public include shorter and more reliable commute times and increased ridership leads to a reduction in traffic. Environmental benefits include cleaner air by reducing traffic congestion and greenhouse gas emissions. Commuter rail benefits employers by providing access to a wider pool of talent. A dependable and reliable transit service enhances productivity.

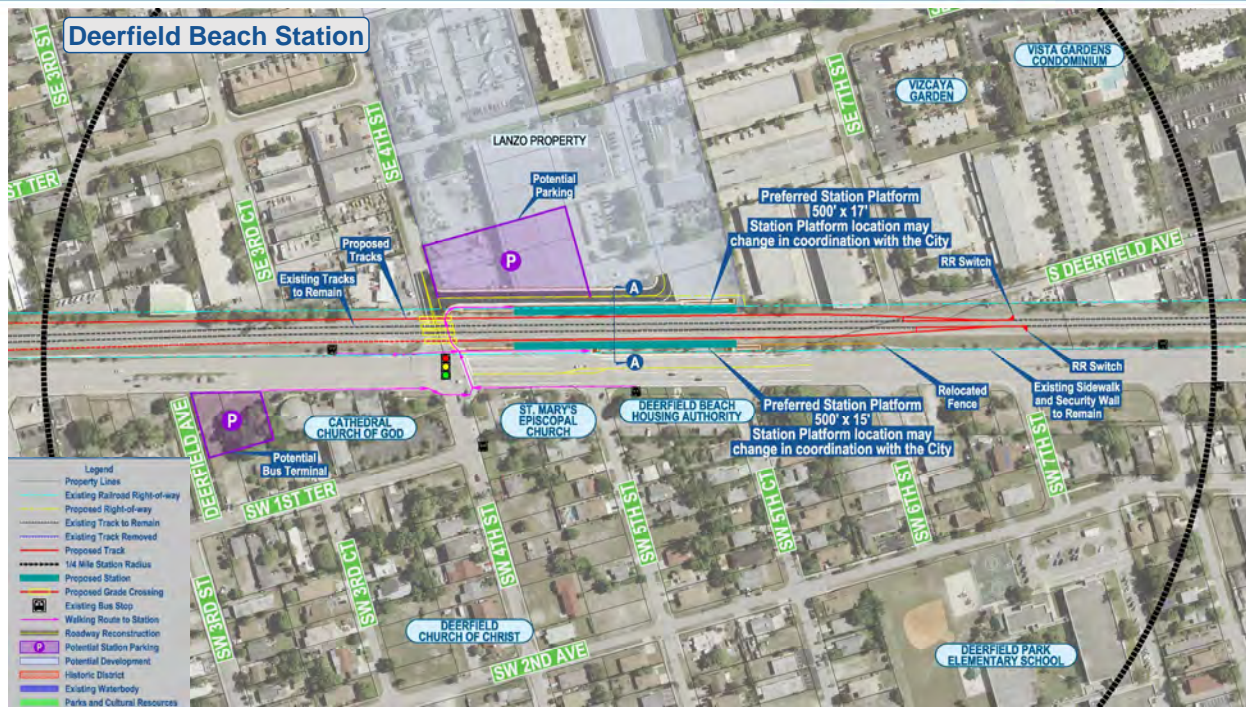
- ❑ Shared-use corridor with FEC freight trains and intercity passenger trains
- ❑ Florida East Coast Railway, L.L.C. owns the FECR right of way and operates freight service
- ❑ Brightline operates inter-city passenger rail trains via a passenger easement in the corridor



The FEC corridor is a shared-use corridor with FEC freight trains and intercity passenger trains. Florida East Coast Railway, L.L.C. owns the FECR right of way and operates freight service. Brightline operates inter-city passenger rail trains via a passenger easement in the corridor.



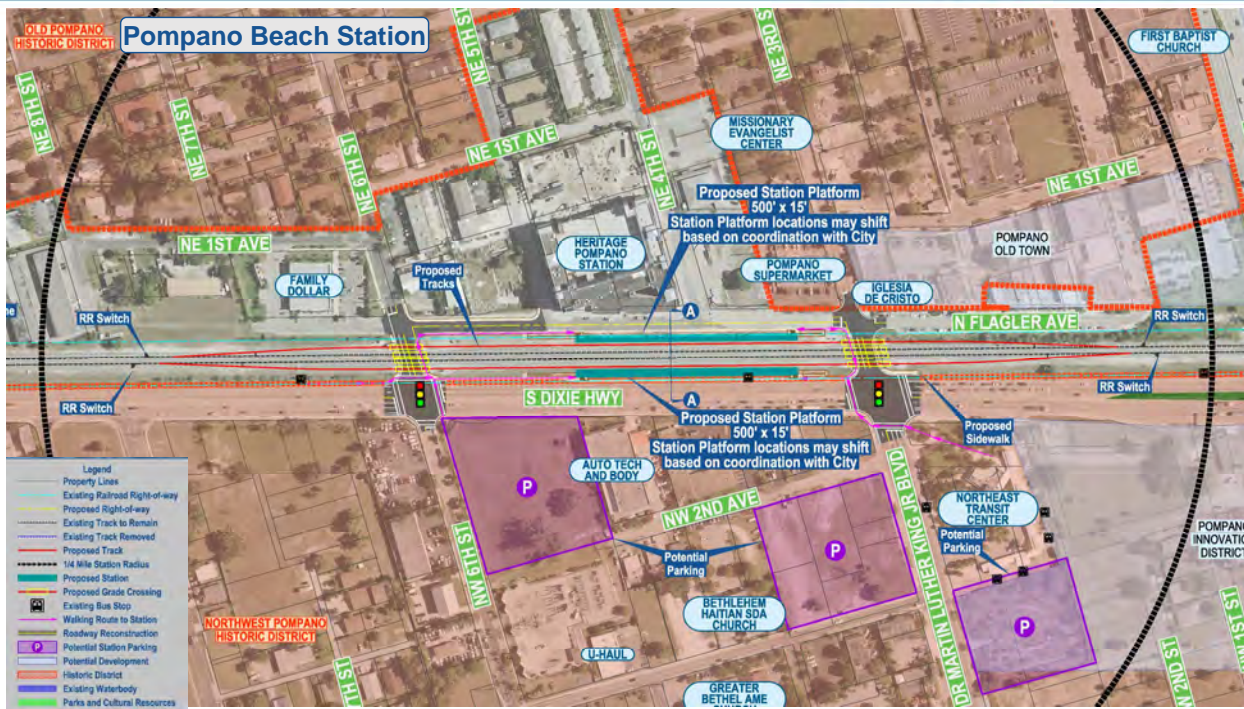
# Station Locations



Through coordination with municipalities and stakeholders in Broward County, six Broward Commuter Rail station areas have been identified to advance through the PD&E process.

Deerfield Beach is the northernmost station for Broward Commuter Rail. Station location and alignment is being developed in coordination with the City. A station screening report provides more detail on each station and why they were selected.

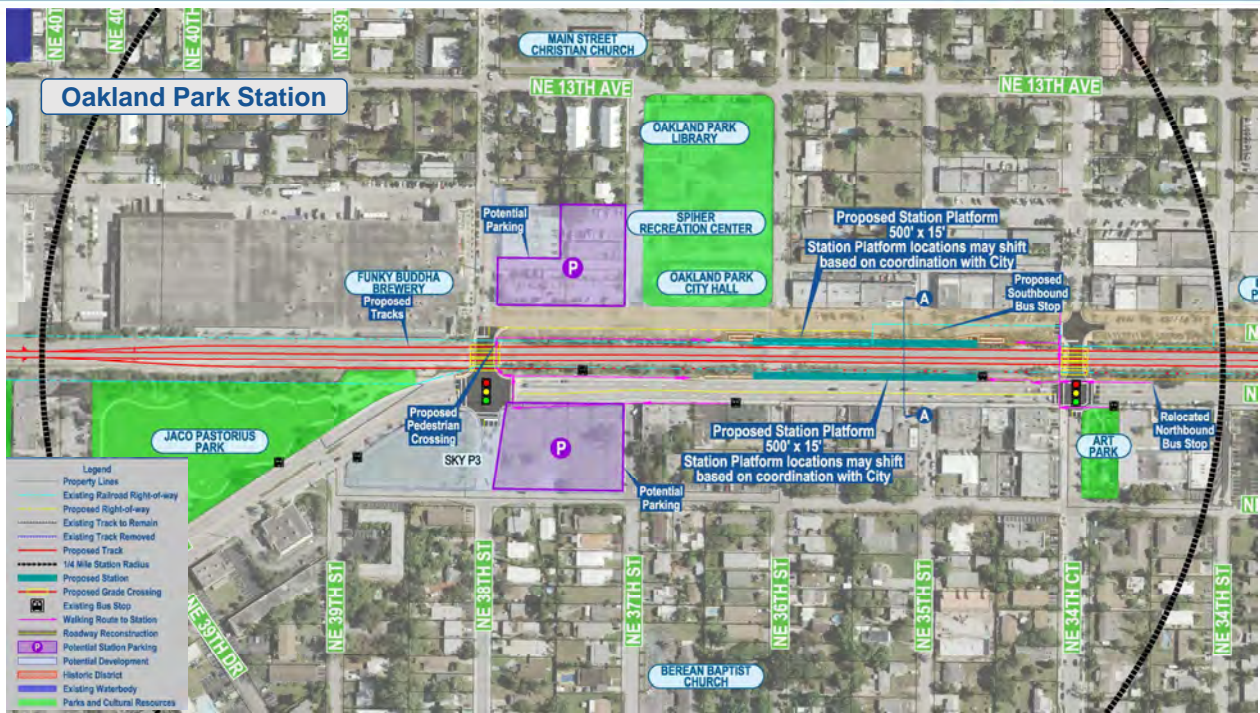
# Station Locations



The Pompano Beach station is located just south of Deerfield Beach in the historic downtown. Station platform location and alignment are still being developed with the City and are further described in the station screening report.

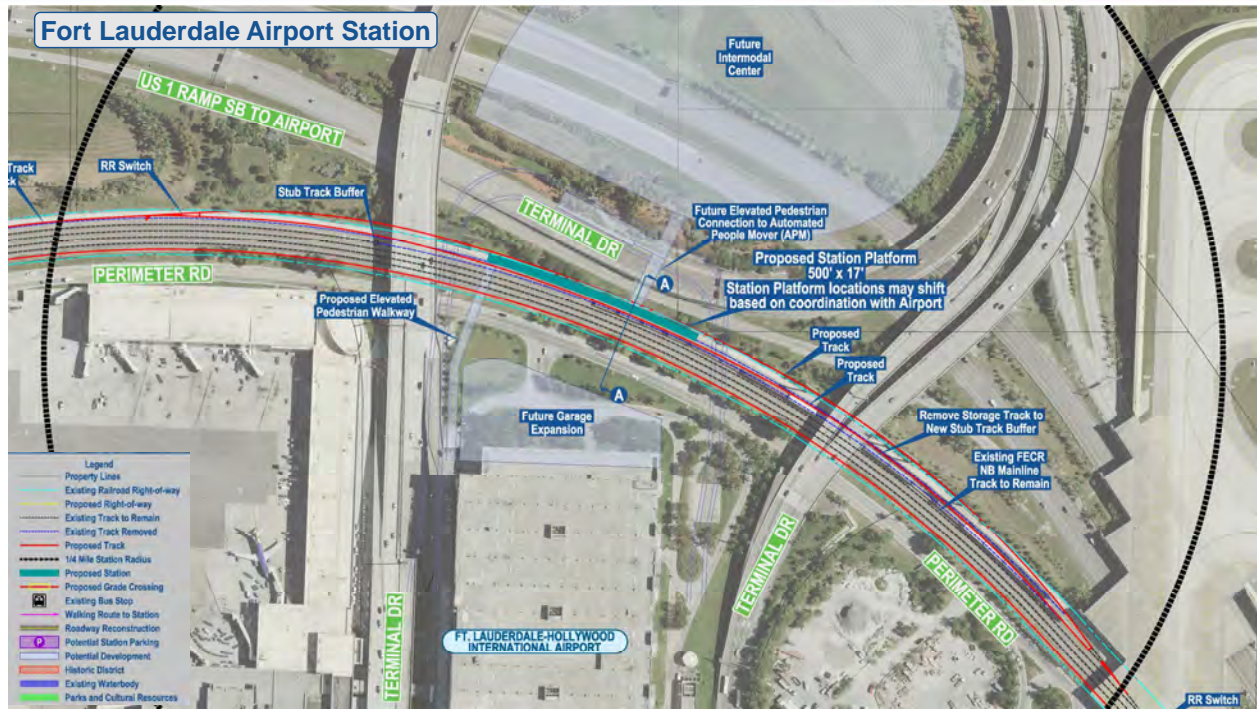


# Station Locations



The Oakland Park station area is located in downtown Oakland Park and the platform location and alignment are still being developed in coordination with the City. Additional details are described in the station screening report.

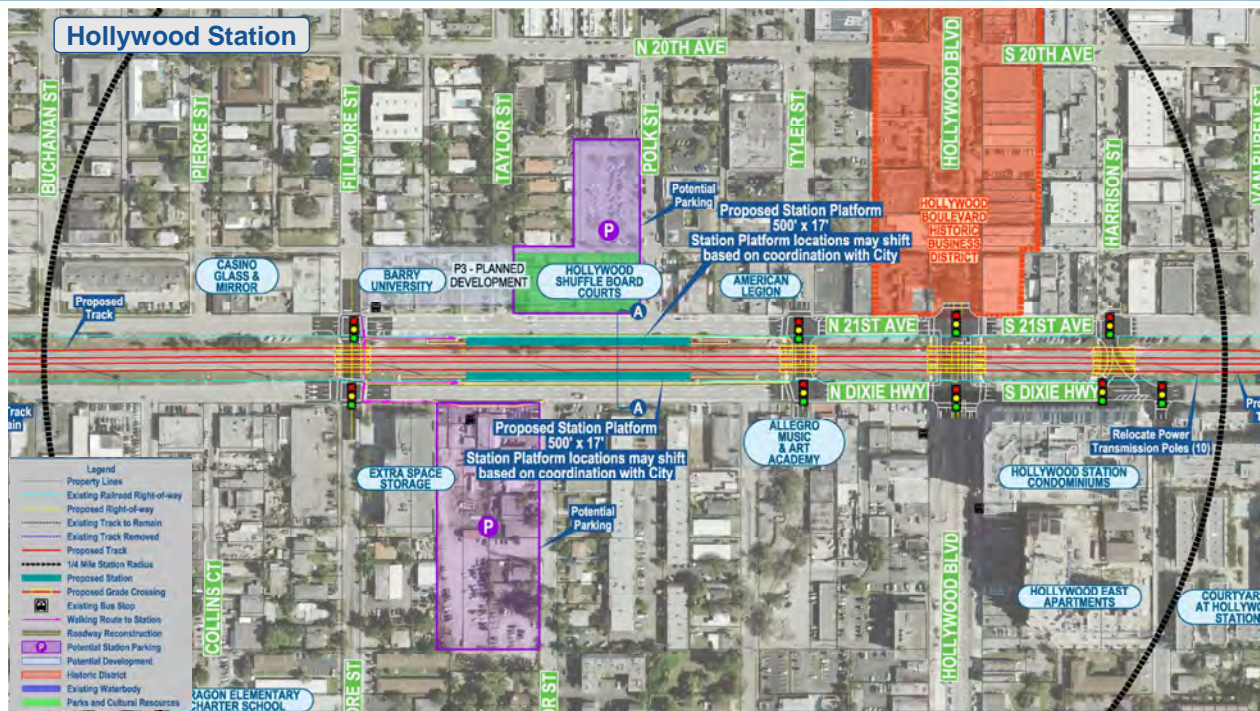
# Station Locations



The airport is a major destination for the Broward Commuter Rail. There is ongoing coordination between the Airport, FECR, Brightline and the Broward Commuter Rail for this station.



# Station Locations



The Hollywood station is adjacent to Hollywood’s downtown core and is the southernmost station for the Broward Commuter Rail. The platform location is being finalized in coordination with the City. Further details are described in the station screening report.



- ❑ Feasibility Study Completed in 2020
- ❑ Extensive Stakeholder and Agency Coordination
- ❑ Considerations
  - Maintain maritime, freight and passenger rail operations
  - Existing freight bascule bridge to remain
  - Accommodate planned Premium Transit on Broward Boulevard
  - Connect to Brightline station downtown
  - Improve connectivity downtown
  - Avoid, minimize, or mitigate impacts to historical resources, neighborhoods and right of way
- ❑ Four River Crossing Alternatives under Evaluation from the Feasibility Study
  - Low-Level Bascule Bridge
  - Mid-Level Bascule Bridge
  - High-Level Fixed Bridge
  - Tunnel



In response to the state legislative action, a new river feasibility study was completed in 2020 to evaluate a new river crossing connection as part of the Broward Commuter Rail project. The study included extensive stakeholder and agency coordination.

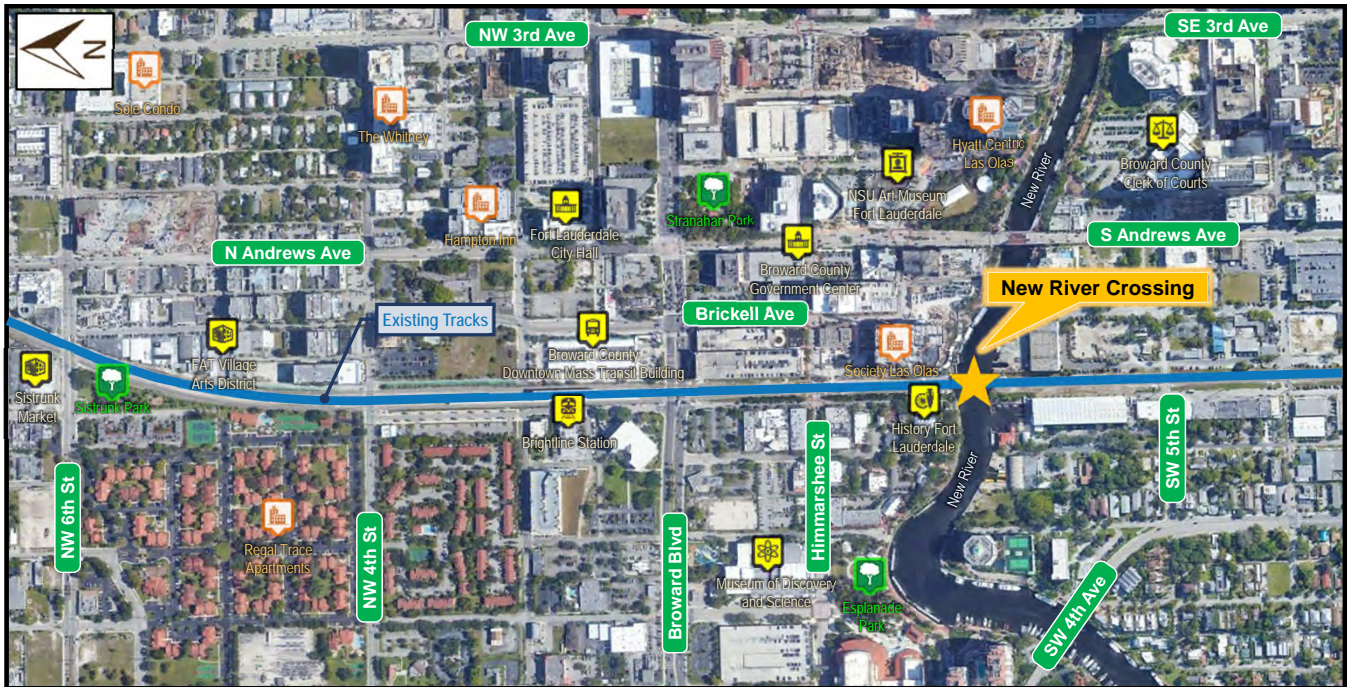
The main considerations for the river crossing are to:

- Maintain maritime, freight and passenger rail operations
- Keep the freight bascule bridge in service
- Accommodate planned Premium Transit on Broward Boulevard
- Connect to the Brightline station downtown
- Improve connectivity in the downtown area
- Mitigate, minimize, or avoid impacts to historical resources, neighborhoods and right of way

There are four Crossing Alternatives Under Evaluation:

- A Low Level Bascule Bridge, which is a drawbridge that would remain open until a train needs to pass and then it would close.
- A Mid Level Bascule Bridge
- A High Level Fixed Bridge
- And a Tunnel

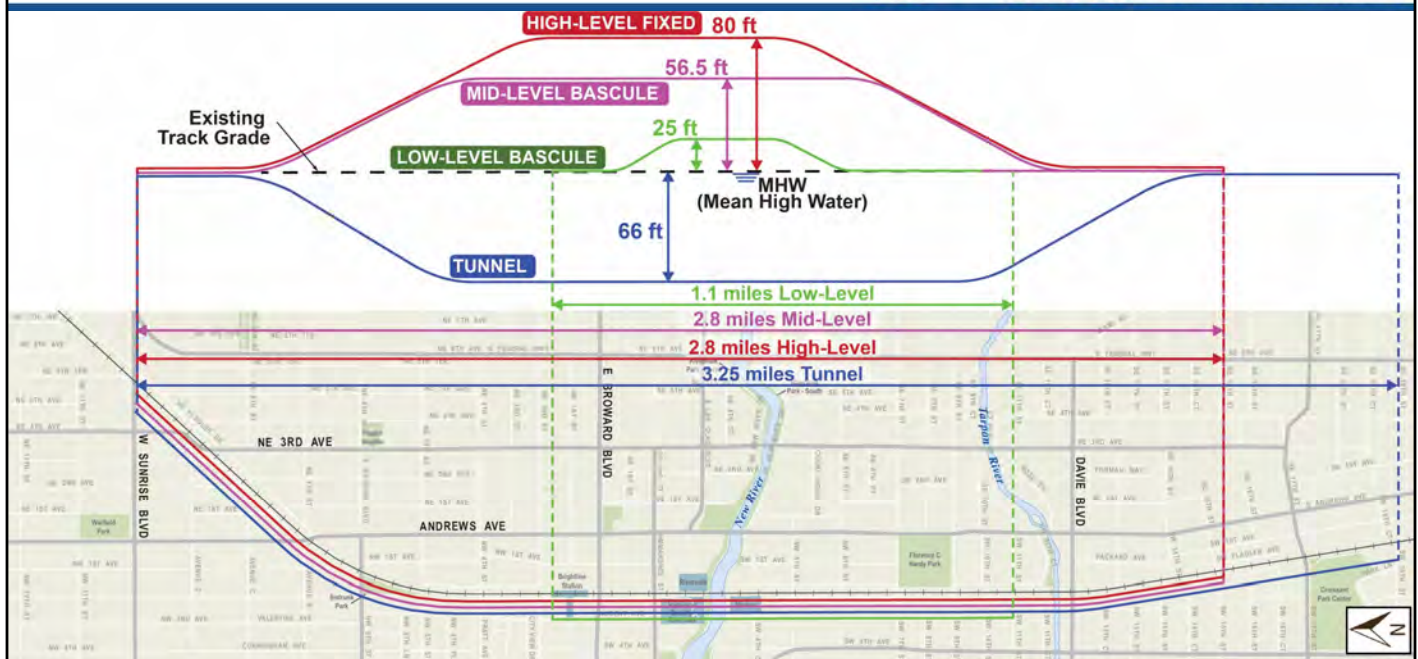
## Existing Conditions – NRC Location



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The New River Crossing is located in downtown Fort Lauderdale adjacent to the Historic Districts on the west side and the Broward County government center on the east side. There are many other commercial and residential properties adjacent to the corridor such as the new Society Las Olas rental property and the Regal Trace apartments.





Note: The lengths shown above includes the crossing alternative length plus necessary rail track work associated with each alternative.

This is a graphic comparing each of the build alternatives as they relate to the height above the New River’s mean high water and the total length or footprint of the alternative.

The first alternative that we’re looking at is a low-level bascule bridge, shown in green, which provides a 25 foot vertical clearance at the river, as opposed to the freight bridge which would be shifted east and remains at the existing 4 foot vertical clearance.

The next alternative is a mid-level bascule bridge, shown in pink, which provides a 56 and a half foot vertical clearance at the river. The Mid-Level is a longer bridge that spans Broward Boulevard, touching down north of Sistrunk Boulevard on the north end and south of SW 9th Street on the south end. It will require an elevated platform at the current Brightline station.

The third bridge is a High-level fixed bridge, shown in red, with 80-foot vertical clearance at the river. This alternative has the same touch down points as the Mid-Level alternative and therefore, also overpasses Broward Boulevard and requires an elevated platform at the Brightline station.

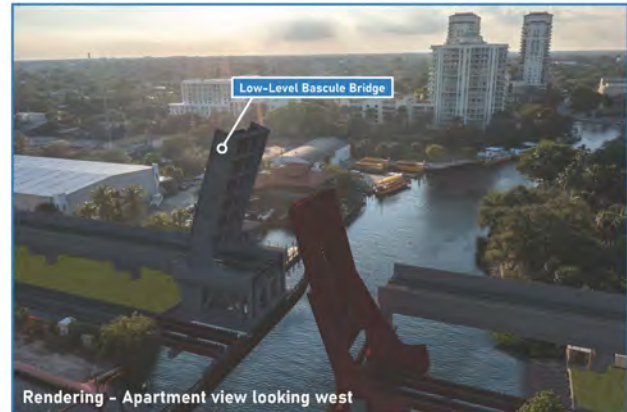
The fourth alternative we are evaluating is a tunnel. The tracks inside the tunnel are located 66 feet below the mean high-water level. The tunnel is the longest of the alternatives. The low level bridge is 1.1 miles, the mid- and high-level bridges are 2.8 miles each, and then the tunnel is 3.25 miles long, the tunnel portals are located south of Sunrise Boulevard and south of SW 15th Street.

### □ Benefits

- 25-foot clearance above water surface
- 90% of vessels pass when bridge is closed (Note: 80% of the boats serviced by marinas are large and require the bridge to open to pass)
- Existing Brightline station can remain at-grade with minor modifications
- Lowest construction cost and disruption
- Least number of right of way impacts

### □ Challenges

- Large pier/column to support bascule
- Bascule bridge requires annual operations and maintenance
- Bridge tender needed full-time
- Closes SW 5th Street
- Passenger trains remain at-grade across Broward Boulevard

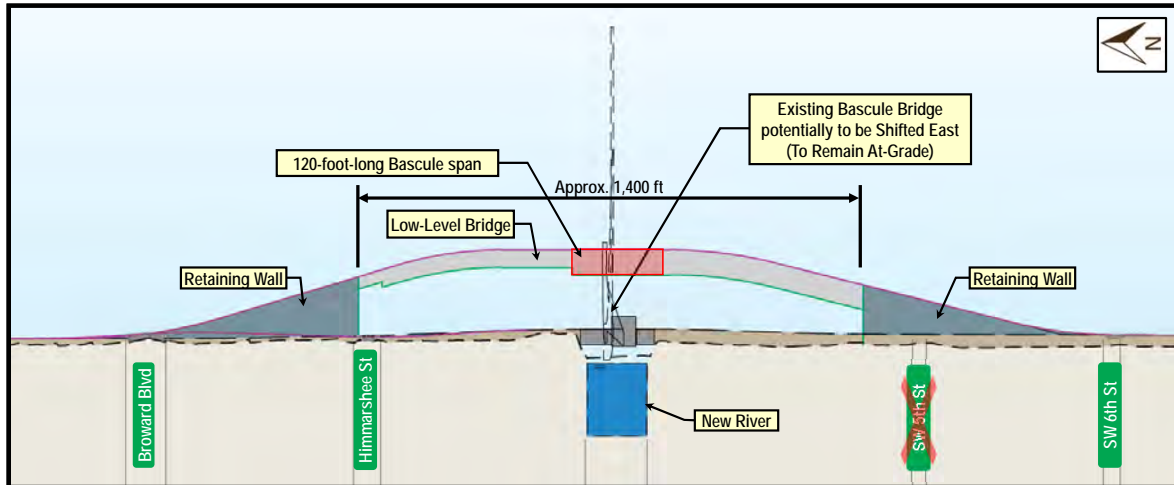


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These are renderings of the low-level bascule Bridge. A New River view looking east is shown on the left and a view from the apartments looking west is shown on the right. The benefits and challenges of the low level alternative are listed here. The 25 foot vertical clearance serves 90% of all boats when the bridge is closed, while only serving 20% of the large boats that frequent the marina businesses.

The existing Brightline station, north of Broward Boulevard, would remain requiring only a platform extension to the north for the commuter rail service. As mentioned on the previous slide, Southwest 5<sup>th</sup> Street would require permanent closure where the bridge transitions to a retaining wall. The low-level alternative has the lowest construction costs and the least number of right of way impacts.

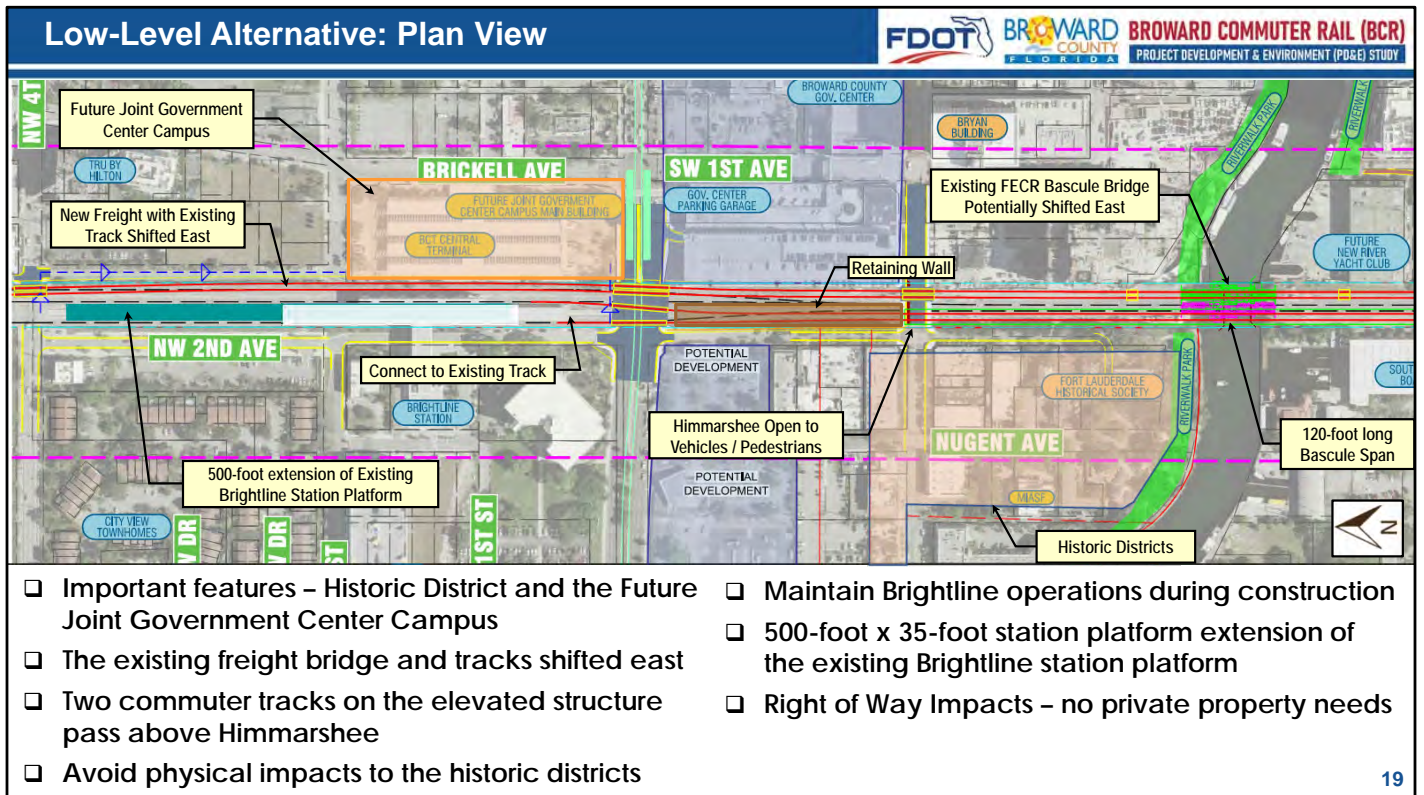
- ❑ 25-foot clearance above New River surface
- ❑ Himmarshee Street remains open to cars and pedestrian traffic
- ❑ Comes down to street level at Broward Boulevard to the north and SW 6<sup>th</sup> Street to the south
- ❑ Existing bascule bridge serving freight potentially to be shifted east and will remain at-grade



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This is a vertical profile of the Low-level bridge which crosses 25 feet above the New River’s mean high water and spans over Himmarshee Street so it can remain open, touching down at Broward Boulevard. You can see on the right side, in the gray area, the retaining wall will require closure of Southwest Fifth Street, as shown by the red “X”. The total length of the Low-Level bridge is about 1400 feet.





This is a Low-Level bascule bridge plan view in downtown. Some of the important features to point out include: The **Historic District north of New River**, the **future joint government center** campus north of Broward Boulevard, and the various potential development areas close to the corridor.

There are two existing mainline tracks within the FEC Railroad corridor. We're coordinating with FEC who owns the railroad corridor regarding relocating the existing tracks. Today the tracks are in the middle of the right of way.

Each of the bridge alternatives we are discussing today show the proposed relocation of a portion of their **tracks further to the east**, so we can build the new bridge within the right of way to avoid affecting the **historic districts** and minimize any other right-of-way needs.

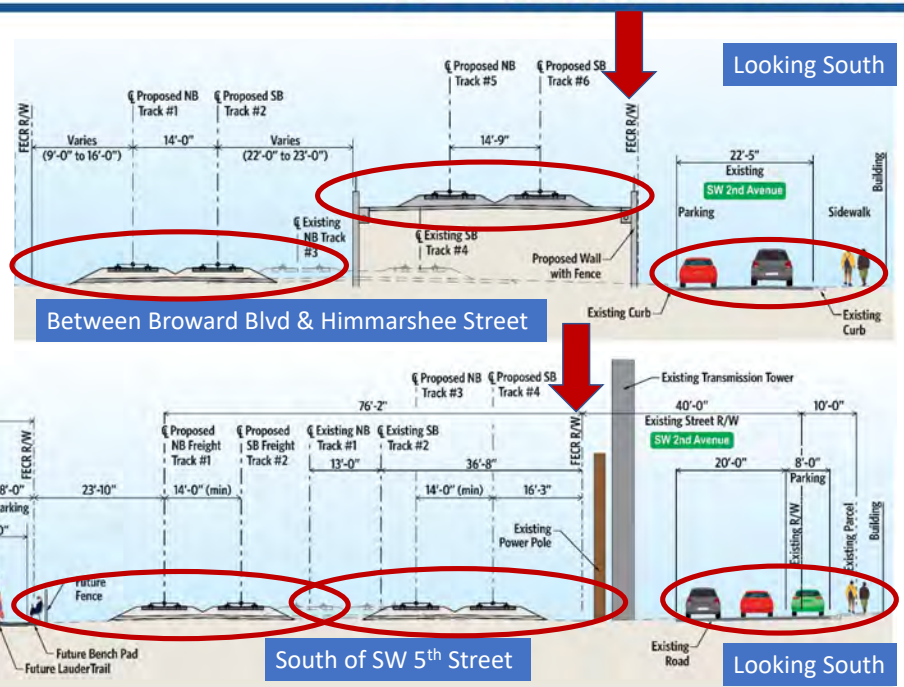
The planned Joint Government Center Campus project could be developed in conjunction with any of these alternatives, similar to what Miami Dade County did years ago when they built the Miami Dade County Government Center, they actually built the metro rail station and the Government Center as one project and got federal funding for it.

The Low-Level alternative ties into the existing tracks just north of Broward Boulevard and provides a **500-foot by 35-foot platform** extension north of the existing Brightline Station platform.

There are no private property right of way needs on the Low-Level alternative.

## Low-Level Alternative: Typical Sections

- Existing Freight tracks shifted to the east
- Low-Level design (tracks, bridges and retaining walls) remains inside FECR R/W
- SW 2<sup>nd</sup> Ave between Broward and New River along Historic District is not impacted



These low-level alternative typical sections, looking south, show the existing freight tracks shifted to the east, as shown on the left side. The new commuter tracks are shown to the west and remain within the existing FECR Right of way, as shown on the right side. Neither of the historic districts on the west side of the project nor SW 2<sup>nd</sup> Avenue are impacted by the Low-Level alternative. There are no private property right of way needs with this alternative.



EXISTING SW 2<sup>ND</sup> AVENUE LOOKING SOUTH

### DESIGN FEATURES CAN ACTIVATE SPACES & PROTECT NEIGHBORHOOD CHARACTER & CONTEXT:

- The project provides opportunity for partners to implement these design features as part of the station area design.
- Pavers can help convert a one-way street into a shared street or temporary plaza
- Landscaping can soften structures by adding nature in contrast to hardscape
- Public art on a retaining wall helps create a sense of place and can correspond with neighborhoods and history as well as other local art
- Lighting can be multi-colored and provide enhanced night-time aesthetics



ARTISTIC RENDERING: SW 2<sup>ND</sup> AVENUE LOOKING SOUTH TOWARDS HIMMARSHEE

This example of the low level bridge alternative illustrates how design elements can be incorporated into the station area design to protect and enhance neighborhood character and context and create a sense of place. Enhanced lighting, pavers, educational murals, local art and landscaping together create an active streetscape to attract people and increase ridership.

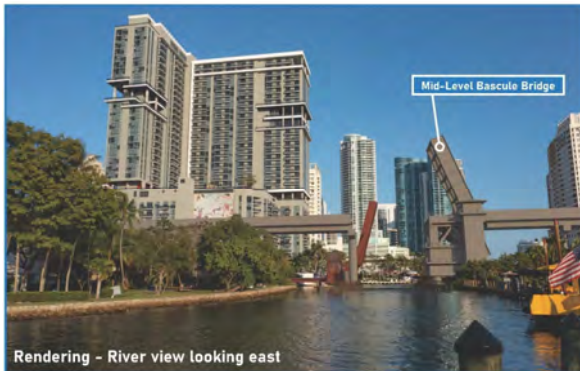


### □ Benefits

- 56.5-foot clearance above water surface
- 99% of vessels pass when bridge is closed
- No cross street closures
- Passenger trains pass over these cross streets: N Andrews Avenue, Sistrunk Boulevard, N 4th Street, Broward Boulevard, Himmarshee Street, SW 5th Street, SW 6th Street, SW 7th Street, and SW 9th Street

### □ Challenges

- Large pier/column to support bascule
- Higher costs compared to Low-level alternative
- Higher number of right of way impacts compared to Low-Level alternative
- Bascule bridge requires annual operations and maintenance
- Bridge tender needed full time
- Requires elevated station
- Short segment of SW 2nd Avenue closed between SW 10th Street and SW 11th Street

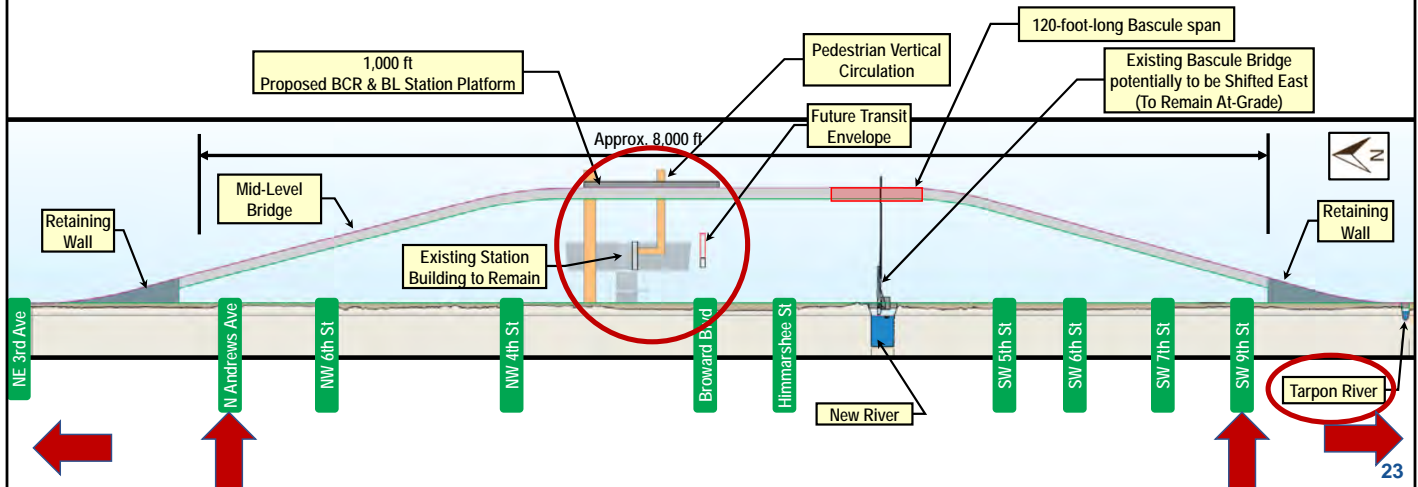


These are renderings of the mid-level bascule bridge. Some of the Mid-Level Bascule bridge benefits are that 99% of boats on the river are able to pass under the bridge when in the closed position, there are no street closures, and the passenger trains will pass over all the cross street between Andrews Avenue and SW 9<sup>th</sup> Street.

Some of the challenges with the Mid-Level Bascule bridge include larger pier and bascule supports, higher maintenance costs due to providing a full time bridge tender, more right of way impacts compared to the low-level alternative, and a short segment of SW 2<sup>nd</sup> Ave has to be closed between SW 10<sup>th</sup> and SW 11 streets. The bridge will span over the Brightline Station, requiring an elevated passenger platform that will connect down to the mezzanine level of the existing station.

## Mid-Level Alternative: Elevation View

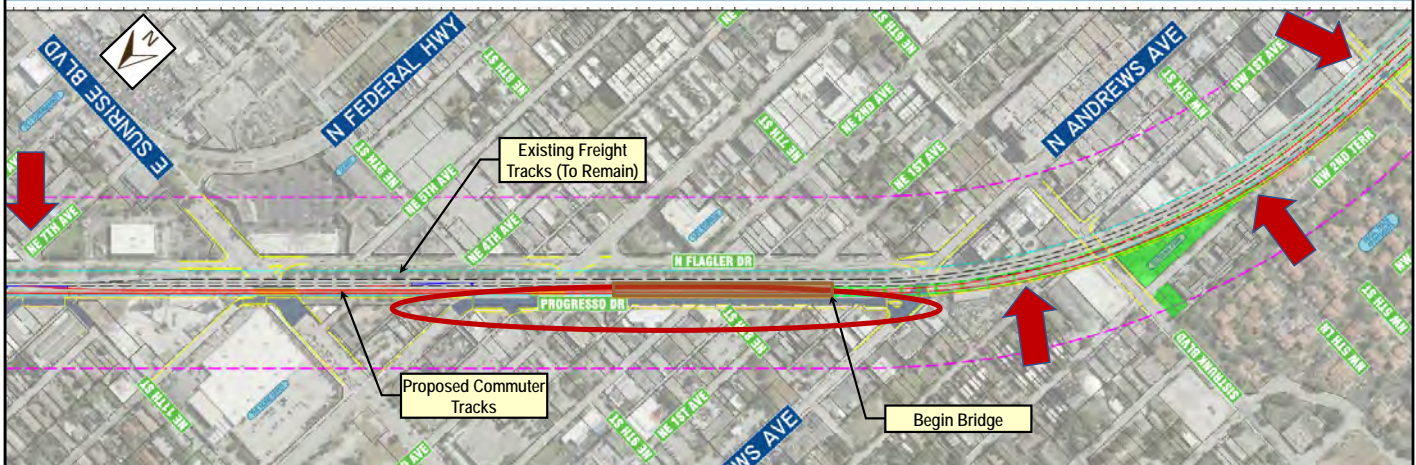
- ❑ 56.5-foot clearance above New River surface
- ❑ Himmarshee Street remains open to cars and pedestrian traffic
- ❑ Comes down to street level north of Andrews Avenue and north of the Tarpon River
- ❑ No street closures
- ❑ Existing Brightline station building will be modified to accommodate vertical circulation to new platform
- ❑ Existing bascule bridge serving freight potentially to be shifted east and will remain at-grade



The Mid-Level Bascule bridge is at 56 and a half feet above the mean high water of New River and continues at that height to span across the existing Brightline station. This vertical profile or elevation view helps to convey that the Mid-Level bridge is about 8 thousand feet long and spans across and does not close any of the East West railroad crossings from Andrews Ave on the north end, **shown on the left side**, to SW 9<sup>th</sup> Street on the south end, **shown on the right side**. There will be a new bridge to span across the **Tarpon River** at the existing freight track elevation on the south end. There will be connections from the new 1000 foot elevated platform down to the existing Brightline station using elevators and escalators depicted in the **yellow vertical lines**. Keep in mind that although the bridge profile touches down as shown, the trackwork extends **north to** Sunrise Boulevard and south past Davie Boulevard.



## Mid-Level Alternative: Plan View North of Station

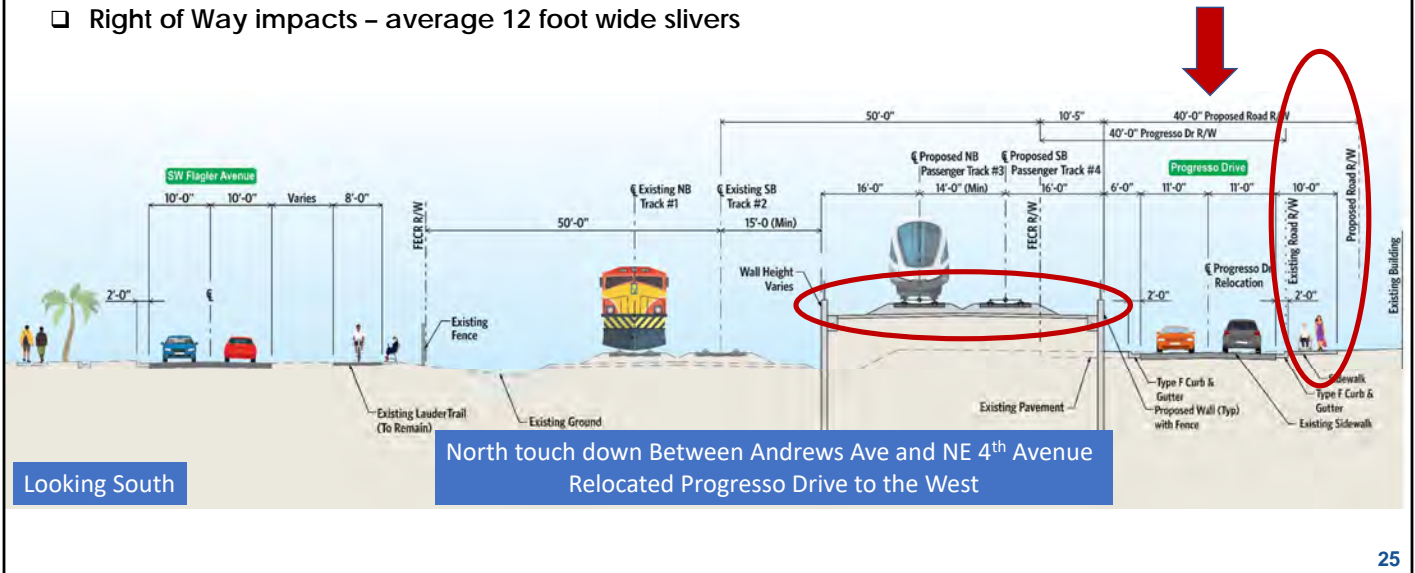


- Bridge starts just north of Andrews Avenue
- Two proposed commuter tracks west of existing freight tracks
- No impacts to Flagler Drive
- Progresso Drive shifts west
- Right of Way – 12 foot wide slivers along Progresso Drive & south of Andrews Avenue, including 6 aerial easements

This is the Mid-level plan view showing the north end of the project between **NE 7<sup>th</sup> Avenue** and NW 4<sup>th</sup> Street. This alternative has **two commuter tracks** proposed west of the existing freight tracks, which will remain. **The bridge** begins just north of Andrews Avenue with **retaining walls** on the approach and this requires the shift of Progresso Drive to the west. The right of way needs include several 12-foot wide slivers **along Progresso Drive** and south of Andrews Avenue, including 6 aerial easements. For example, the Regal Trace apartment recreation center, pool and basketball courts will be able to resume normal use after the bridge is constructed. The bridge overhang at this location is between 33 and 60 feet above the ground.

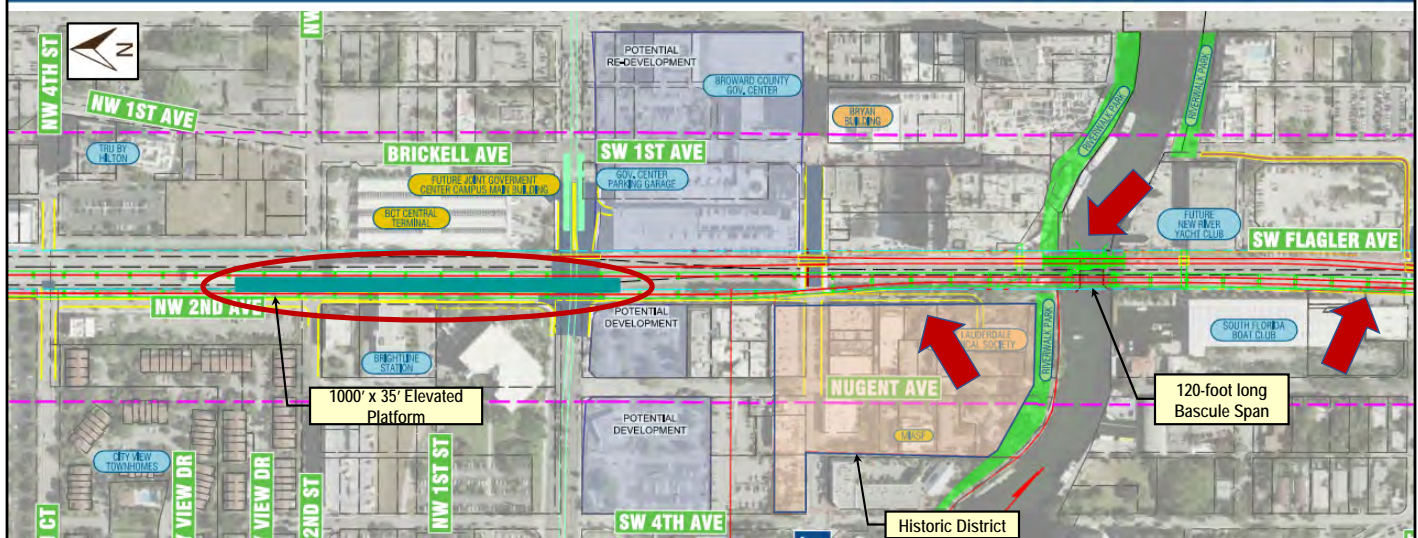
## Mid-Level Alternative: Typical Section Progresso

- ❑ Retaining wall at bridge touchdown points
- ❑ No impacts to Flagler Drive
- ❑ Progresso Drive shifts west
- ❑ Right of Way impacts – average 12 foot wide slivers



This Mid-Level typical section, looking south, shows the view of the retaining walls at the bridge touch down on the north end **between Andrews Avenue** and NE 4<sup>th</sup> Avenue. This requires a shift of the existing Progresso Drive **to the west** and purchase of an average width of **12 foot slivers** of right of way from the adjacent properties.

## Mid-Level Alternative: Plan View Downtown



- The existing freight bridge and tracks shifted east
- Two commuter tracks on the elevated structure above all the cross streets and NW 2<sup>nd</sup> Ave
- Avoid physical impacts to the historic district
- Maintain Brightline operations during construction
- 1,000-foot x 35-foot station platform above and with connections to the existing Brightline Station
- Right of Way Impacts – two aerial easements just south of the river

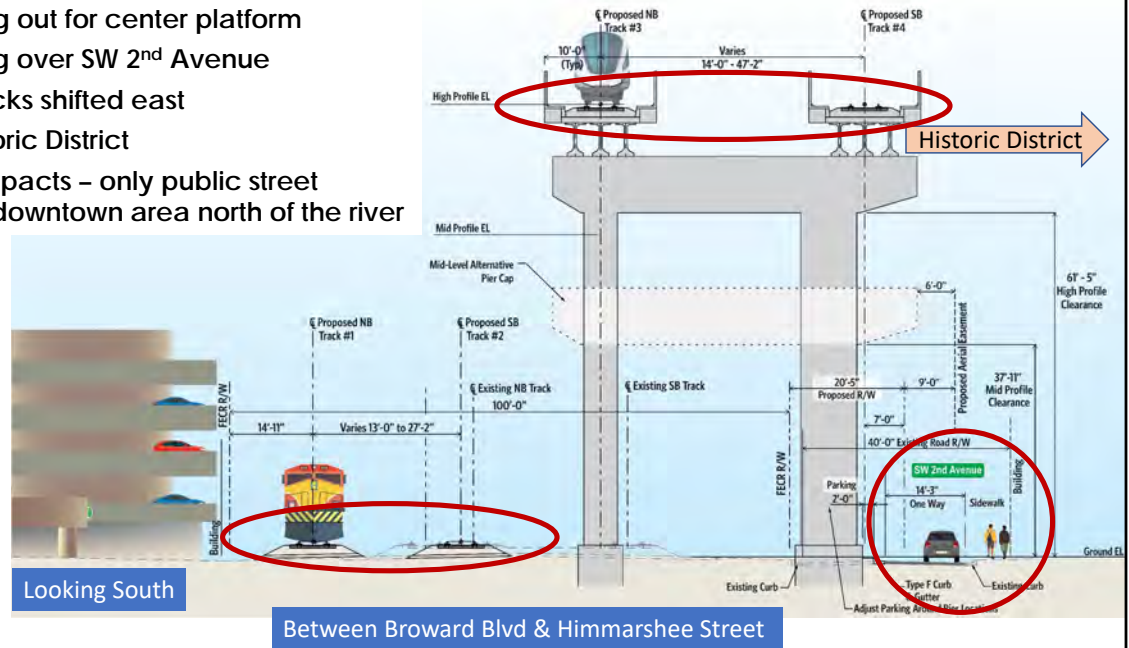
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This plan view of the downtown area for the Mid-Level alternative shows the **existing freight** bridge shifted east so that the new elevated commuter rail can avoid the **historic district** north of the river. The **1,000-foot** by 35-foot elevated platform is above the existing Brightline station. The only private property impacts, in this area, are in the form of **aerial easements** south of the river.



## Mid-Level Alternative: Typical Section

- ❑ Bridge widening out for center platform
- ❑ Aerial overhang over SW 2<sup>nd</sup> Avenue
- ❑ New freight tracks shifted east
- ❑ Avoids the Historic District
- ❑ Right of Way impacts – only public street impacts in the downtown area north of the river



This section looking south shows the view of the Mid and High-level bridges, between **Broward Boulevard** and Himmarshee Street, as they approach the elevated platform at the station. The existing freight tracks and the proposed track alignments are shifted east at the New River to avoid the **Historic District** on the west side. The bridge will partially overhang **SW 2<sup>nd</sup> Avenue** which remains open to traffic.



### INFRASTRUCTURE INTRODUCED AS DESIGN FEATURE WITH ADDITIONAL STREETSCAPE TO PRESERVE OPENNESS AND ACCESS:

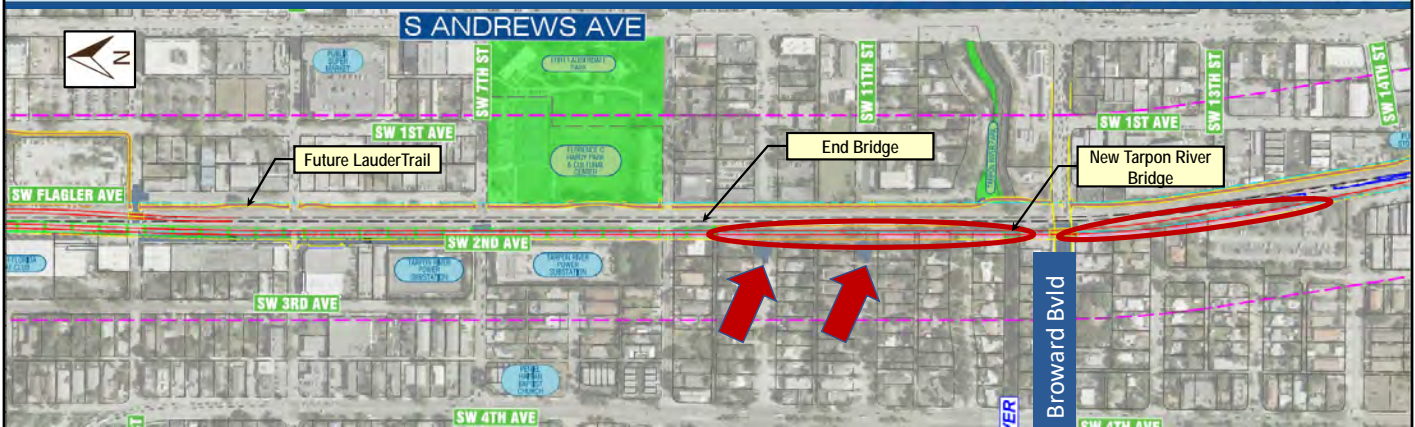
- Artistic column design and sound barrier adjacent to tracks
- Closed-bottom box design encloses the overhead track
- Bollards separate sidewalk from railway
- Pavers add color, texture and visual separation
- Crosswalks delineate safe area for pedestrians to cross



This example of the mid-level bridge rendering illustrates how infrastructure can become a design feature while maintaining a sense of openness and access. Artistic columns and aesthetic treatments on the bridge combined with railings, pavers, bollards and landscape can contribute to this unique design.



## Mid-Level Bridge: South of New River



- ❑ Elevated structure ends south of SW 9<sup>th</sup> Street
- ❑ Accommodates future LauderTrail on the east side of railroad
- ❑ Two commuter tracks west of existing cross Tarpon River on new bridge (at-grade)
- ❑ Need further coordination with Florida Power & Light on transmission tower relocations
- ❑ SW 2<sup>nd</sup> Avenue closed with cul-de-sacs proposed at 10<sup>th</sup> and 11<sup>th</sup> Streets
- ❑ Right of Way Impacts – some residential and business areas averaging 15 feet wide

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South of the River, the mid and high-level bridge alternatives span all the cross streets and **touch down** south of SW 9<sup>th</sup> Street. The future **LauderTrail**, a separate project, is shown on the east side and is accommodated with minor adjustments at the New River. There is a new at-grade bridge at **Tarpon River** and portions of SW 2<sup>nd</sup> Avenue will be closed using **cul-de-sacs**. The **right of way impacts** are mostly limited to 15 foot wide slivers in this area.

### □ Benefits

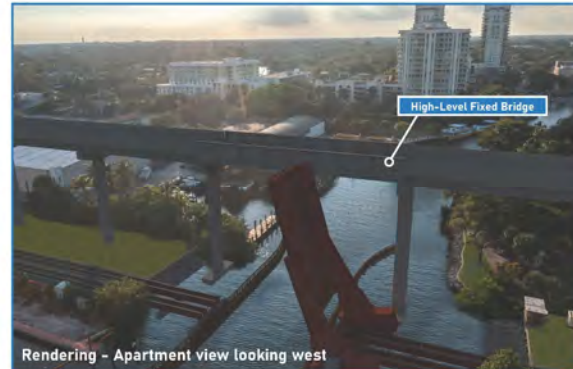
- 80-foot clearance above water surface
- 100% of vessels able to pass under bridge
- No cross street closures
- Passenger trains pass over these cross streets: N Andrews Avenue, Sistrunk Boulevard, NW 4th Street, Broward Boulevard, Himmarshee Street, SW 5th Street, SW 6th Street, SW 7th Street, and SW 9th Street
- No bascule bridge pier required to cross the river
- No bascule bridge to operate and maintain
- Lowest operations and maintenance cost alternative



Rendering - River view looking east

### □ Challenges

- Higher construction cost compared to Low-Level alternative
- Higher number of right of way impacts compared to Low-Level alternative
- Requires elevated downtown station
- Short segment of SW 2nd Avenue closed between SW 10th Street and SW 11th Street



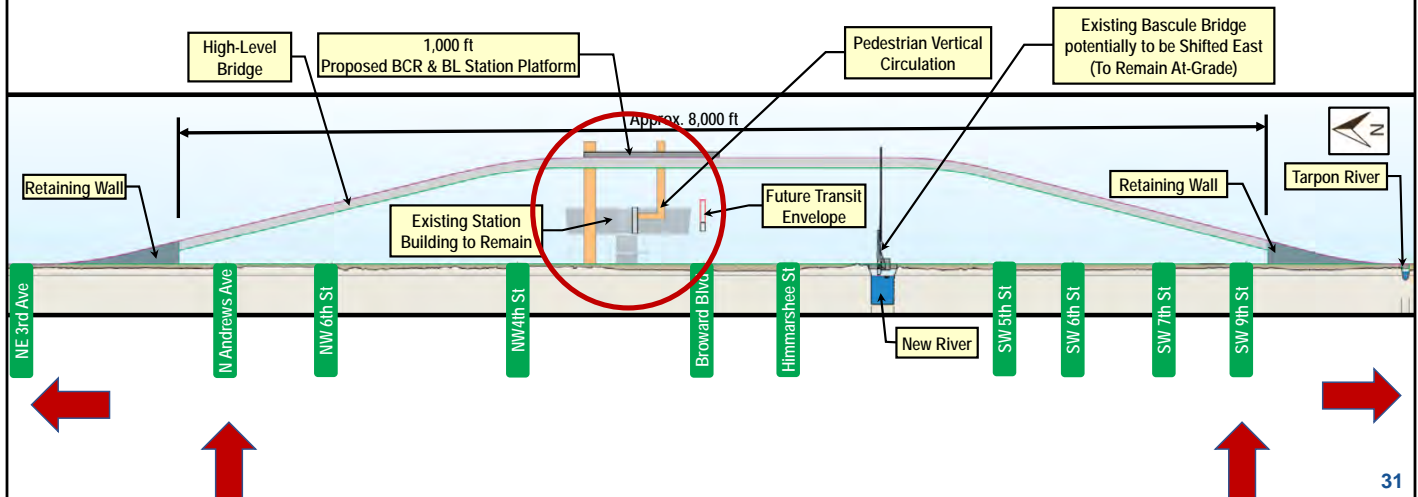
Rendering - Apartment view looking west

The High-Level Fixed bridge has the highest clearance above the mean high water. Some of the benefits are that 100% of the boats on the river can pass under the bridge, there are no street closures, and the passenger trains will pass over all the cross streets between Andrews Ave and SW 9<sup>th</sup> Street. The Fixed bridge does not have the operation and maintenance costs necessary for a bascule, nor the large piers in the River.

Some of the challenges with the High-Level Fixed bridge include higher number of right of way impacts compared to the low level alternative, an elevated station, and a short segment of SW 2<sup>nd</sup> Avenue to be closed between SW 10<sup>th</sup> and SW 11<sup>th</sup> street.

## High-Level Alternative: Elevation View

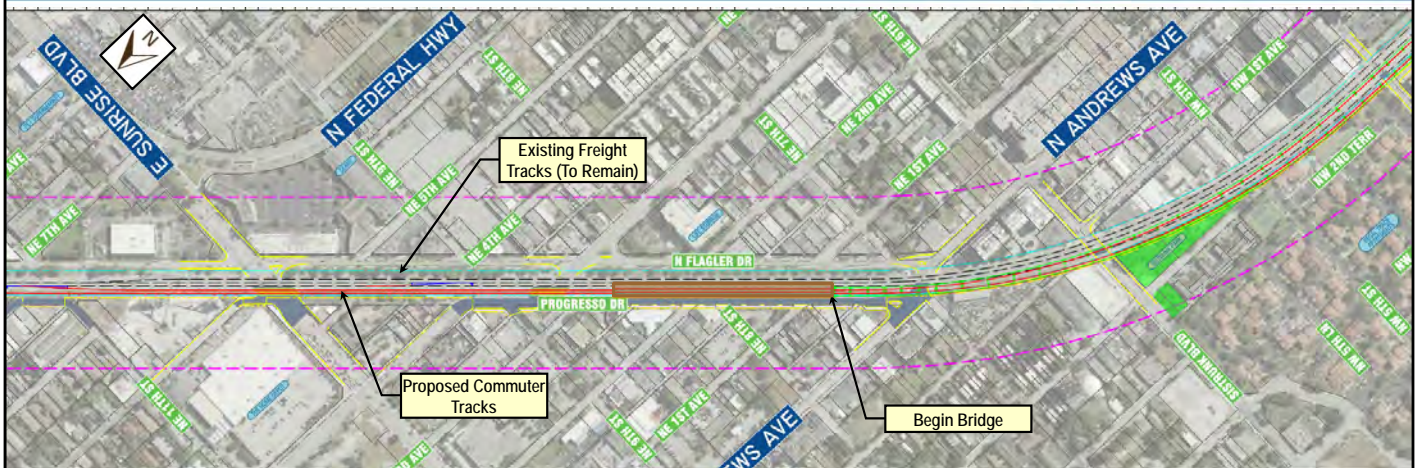
- ❑ 80-foot clearance above New River surface
- ❑ Himmarshee Street remains open to cars and pedestrian traffic
- ❑ Comes down to street level south of NE 3<sup>rd</sup> Ave and north of the Tarpon River
- ❑ No street closures
- ❑ Existing Brightline station building will be modified to accommodate vertical circulation to new platform
- ❑ Existing bascule bridge serving freight potentially to be shifted east and will remain at-grade



The High-Level Fixed bridge alternative is very similar to the Mid-Level Bascule, except that it is set at a higher elevation, 80-feet, over the River and the Brightline station. It also spans across and does not close any of the East West railroad crossings from **Andrews Ave** on the north end to **SW 9<sup>th</sup> Street** on the south end.

There will be passenger conveyance from the new 1000 foot elevated platform down to the existing Brightline station using elevators and escalators depicted with the **yellow vertical lines**. Keep in mind that although the bridge profile touches down as shown, the trackwork **extends north** to Sunrise Boulevard and south past Davie Boulevard.

## High-Level Alternative: Plan View North of Station



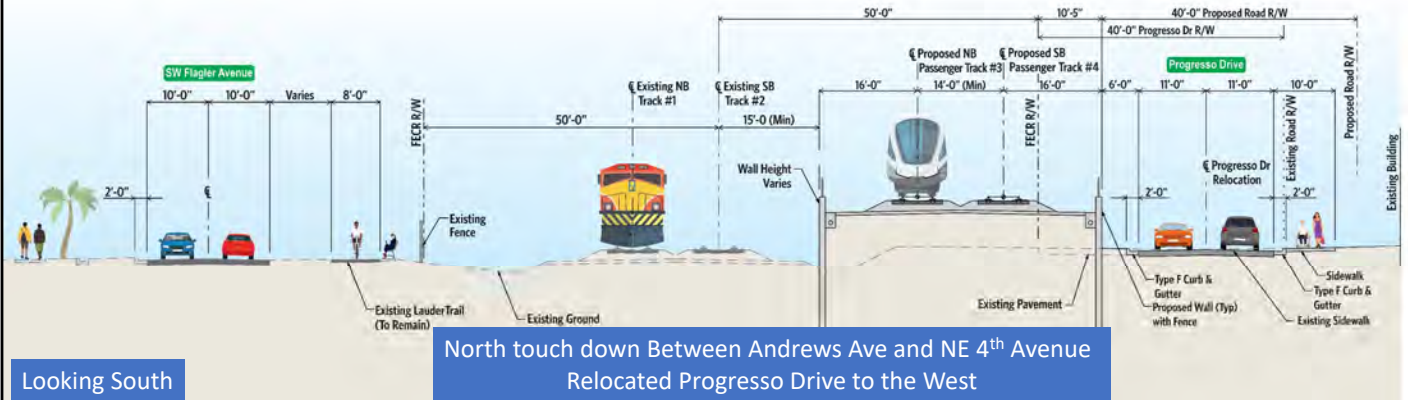
- Bridge starts just north of Andrews Avenue
- Two proposed commuter tracks west of existing freight tracks
- No impacts to Flagler Drive
- Progresso Drive shifts west
- Right of Way – 12 foot wide slivers along Progresso Drive & south of Andrews Avenue, including 6 aerial easements

The High-level alternative north of the station is the same as Mid-level.



## High-Level Alternative: Typical Section Progresso

- ❑ Retaining wall at bridge touchdown points
- ❑ No impacts to Flagler Drive
- ❑ Progresso Drive shifts west
- ❑ Right of Way impacts – average 12 foot wide slivers

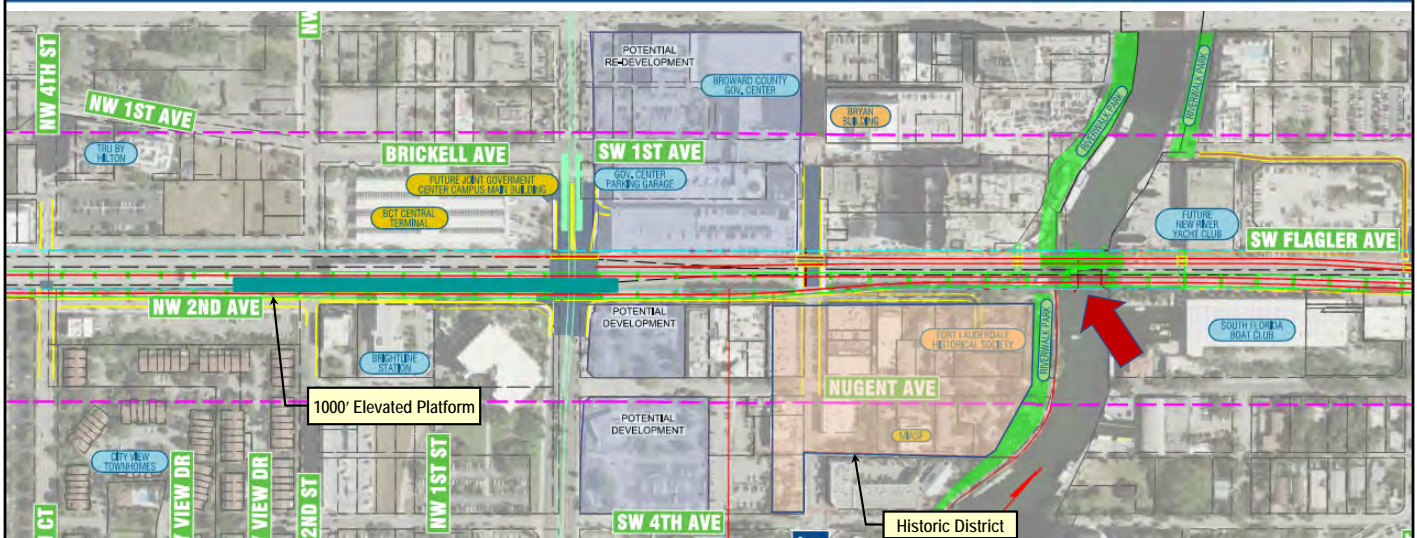


Looking South

North touch down Between Andrews Ave and NE 4<sup>th</sup> Avenue  
Relocated Progresso Drive to the West

The High-level alternative at Progresso Drive is the same as Mid-level.

# High-Level Alternative: Plan View Downtown

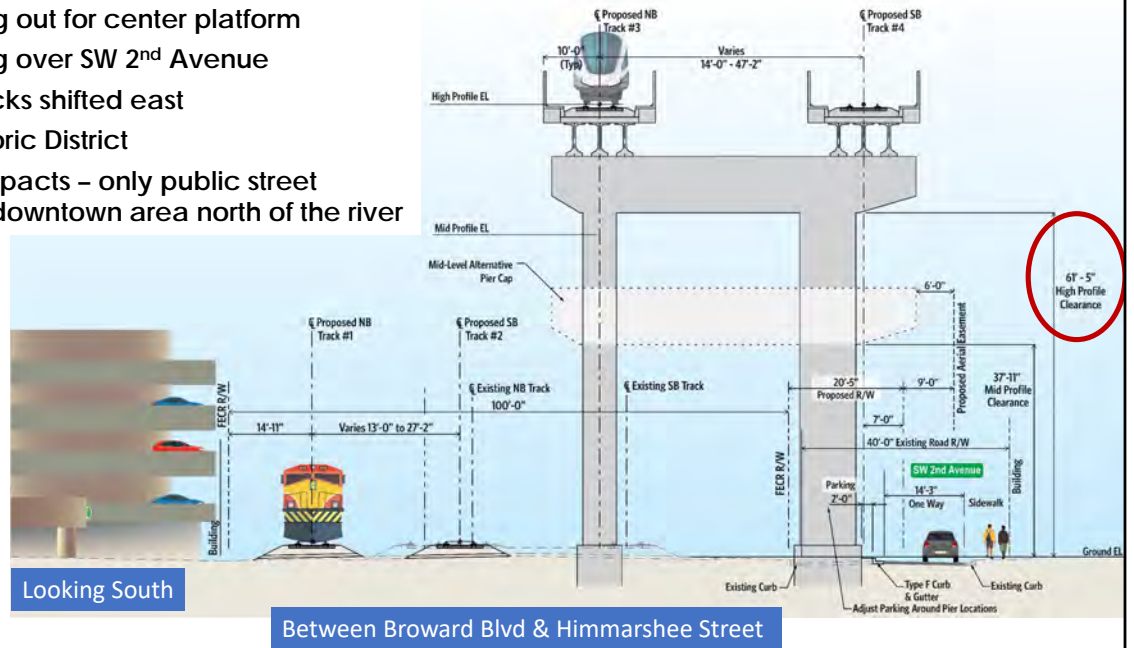


- The existing freight bridge and tracks shifted east
- Two commuter tracks on the elevated structure above all the cross streets and NW 2<sup>nd</sup> Ave
- Avoid physical impacts to the historic district
- Maintain Brightline operations during construction
- 1,000-foot station platform above and with connections to the existing Brightline Station
- Right of Way Impacts – two aerial easements just south of the river

This plan view of the downtown area for the High-Level alternative shows the same features as the Mid-Level, except that the bridge is fixed over the river and is set at 80-feet.

## High-Level Alternative: Typical Section

- ❑ Bridge widening out for center platform
- ❑ Aerial overhang over SW 2<sup>nd</sup> Avenue
- ❑ New freight tracks shifted east
- ❑ Avoids the Historic District
- ❑ Right of Way impacts – only public street impacts in the downtown area north of the river



Again, the High-level design, between Broward Boulevard and Himmarshee Street, is the same as the Mid-level bridge, except that the bridge is higher.



### DESIGN PRESERVES OPENNESS, ACCESSIBILITY AND NEIGHBORHOOD CHARACTER OF FAT VILLAGE:

- Artistic columns and decorative railing
- Column design allows for narrower columns to maintain visibility
- Pavers and landscaping soften the edges of the street
- Utilities will be relocated to accommodate the bridge structure



This example of the mid/high-level bridge rendering illustrates how the bridge design at Sistrunk Boulevard can preserve a sense of openness and accessibility while preserving Flagler Arts Technology Village’s unique character. Here, the bridge design features narrower columns to maintain better visibility to the park and the businesses on either side of the street. Artistic columns and decorative railings enhance the aesthetic appeal of the bridge and pavers and landscaping soften the street edges.





EXISTING HIMMARSHEE/SW 2<sup>ND</sup> AVENUE LOOKING SOUTH

ARTISTIC RENDERING OF INTERSECTION OF HIMMARSHEE AND SW 2<sup>ND</sup> AVENUE LOOKING SOUTH



### INFRASTRUCTURE INTRODUCED AS DESIGN FEATURE WITH ADDITIONAL STREETScape TO PRESERVE OPENNESS AND ACCESS:

- Artistic column design and sound barrier adjacent to tracks
- Closed-bottom box design encloses the overhead track
- Bollards separate sidewalk from railway
- Pavers add color, texture and visual separation
- Crosswalks delineate safe area for pedestrians to cross

This example of the high-level bridge rendering illustrates how a higher bridge can improve the sense of openness, light and access beneath the bridge. Artistic columns and bridge treatment on the underside of the bridge combined with pavers, bollards and landscape further elevate the quality of design.



EXISTING SW 9<sup>TH</sup> STREET LOOKING WEST

### DESIGN ENHANCES CONNECTIVITY AND IS CONSISTENT WITH NEIGHBORHOOD SCALE:

- Steel bridge span with simple artistic columns over SW 9th Street. Artistic concrete columns support the concrete bridge spans.
- Access to LauderTrail is easy to see, safe and attractive
- Landscaping and crosswalks help to define spaces for trail users



ARTISTIC RENDERING AT SW 9<sup>TH</sup> STREET SOUTH OF RIVER LOOKING WEST

This example of the mid/high-level bridge rendering illustrates how the bridge design can enhance aesthetics and connectivity when it is consistent with the neighborhood scale. As the bridge slopes down to the street level across SW 9th Street, there is a change in material from concrete to steel which matches the neighborhood character. Architectural columns, landscaping and crosswalks help define the space for the future LauderTrail bike path and make it accessible, safe and easy to see.

### □ Benefits

- Eliminates vertical clearance issue at New River
- Avoids temporary impacts to the river
- No additional permanent impediment to navigation
- 100% of vessels able to pass
- Passenger trains pass under these cross streets: N Andrews Avenue, Sistrunk Boulevard, N 4th Street, Broward Boulevard, Himmarshee Street, SW 5th Street, SW 6th Street, SW 7th Street, SW 9th Street, and Davie Boulevard

### □ Challenges

- Highest construction cost of all the New River Crossing Alternatives
- Highest number of right of way impacts
- Tunnel has additional operations and maintenance costs: jet fans, air conditioners, pumps, lights, tunnel wall sealing, ventilation, sensors, cameras, underground station, tunnel cleaning, etc.
- Passenger rail station must be relocated underground
- NE 5th Terrace at Sunrise Boulevard intersection closure
- Closes SW 15th Street
- Additional bridge at Andrews Avenue
- Portals are required at tunnel openings



The tunnel is the fourth alternative being evaluated to cross the New River in Fort Lauderdale. This is an artistic rendering of what the tunnel portal would look like on the north end where it emerges at Andrews Avenue. A new Andrews Avenue bridge would be required to span over the portal and maintain traffic. A portal is an approach to the tunnel opening which is approximately 40 feet in depth and 1,200 feet in length that requires walls surrounding the opening to provide support and protection.

One of the benefits of the tunnel includes bypassing the river, thus passing 100% of the vessels. Keep in mind that the existing FEC freight bridge and trains will continue to run as they do today. The tunnel keeps the passenger trains off the cross streets, similar to the Mid and High Level bridge alternatives, and in addition, the tunnel passes under Davie Boulevard.

Some of the challenges of the tunnel alternative are that it has the highest number of right of way impacts, requires the construction of a new underground station and has the highest costs related to construction, and operations and maintenance compared to the other alternatives. For example, the tunnel has additional costs for jet fans, systems, ventilation, sensors, lights, tunnel sealant, and the maintenance of the underground station. This alternative will close SW 15<sup>th</sup> Street on the south end and NE 5<sup>th</sup> Terrace on the north end at the Sunrise Boulevard intersection. The tunnel has the greatest constructability challenges and requires the longest construction time of the 4 alternatives.

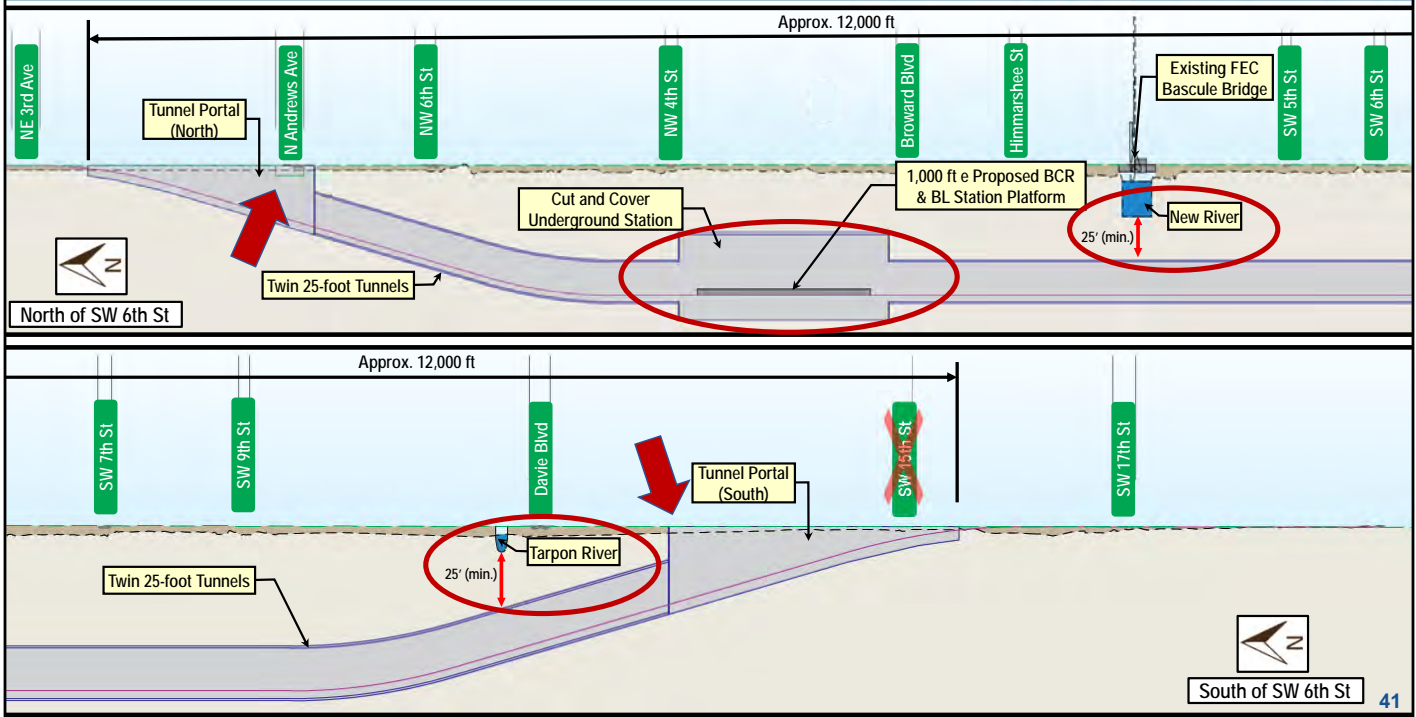




This artistic rendering of the southern tunnel portal depicts how the tunnel transitions from underground. When the tunnel surfaces, the portal walls must be outside of the existing freight tracks, in order to maintain freight operations. The proposed tunnel portal location requires the relocation of SW 2<sup>nd</sup> Avenue to the west, impacting a number of businesses and storage facilities. The properties between the two tunnel portals may require up to 48 underground easements to prevent owners from compromising the tunnel infrastructure.

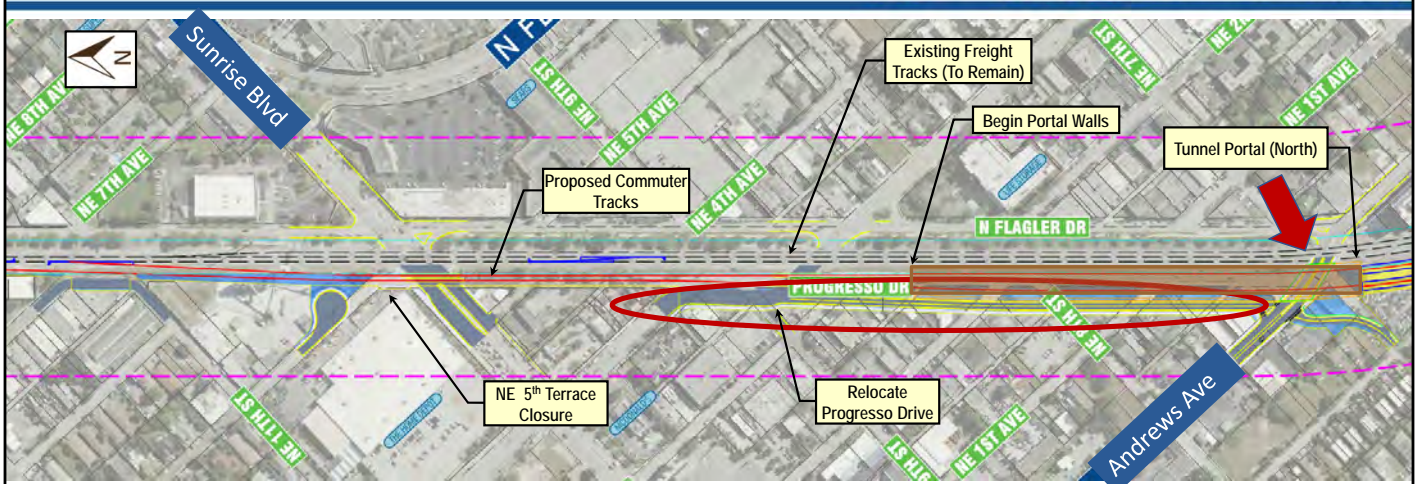


## Tunnel Alternative: Elevation View



This is an elevation view of the tunnel portals. On the top you see the portal on the north side, where the tunnel emerges at **Andrews Avenue**, which remains open to traffic using a new bridge. The tunnel profile depth is determined by the **25-foot clearance** under both the New River and the Tarpon River. The **underground station** is proposed between Broward Boulevard and NW 4<sup>th</sup> Street. The south Tunnel portal remains deep and surfaces **south of Davie Boulevard**. It will require the closure of **Southwest 15<sup>th</sup> Street**.

## Tunnel Alternative: North Portal Area

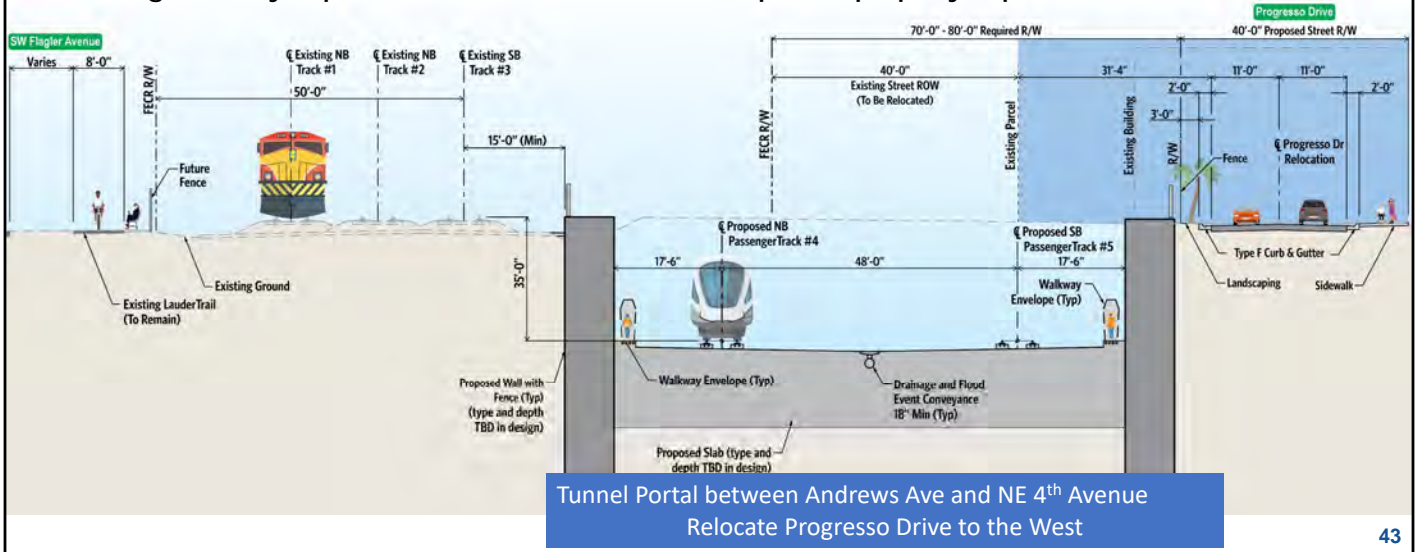


- Existing freight tracks remain
- Two commuter tracks proposed location set by offset to portal walls
- Portal Retaining walls with barrier and fence
- NE 5<sup>th</sup> Terrace connection at Sunrise Blvd closed
- Progresso Drive and NW 7<sup>th</sup> Street shift west
- ROW impacts – between 50' and 80' wide private property need

This is the north tunnel portal plan view. Similar to the Mid and High-level bridge alternative, the tunnel alternative has two new **commuter tracks** proposed west of the existing freight tracks. The portal **walls start** south of NE 3rd Avenue along Progresso Drive to south of Andrews Avenue where it goes under ground. **NE 5th Terrace** connection at Sunrise Blvd will be closed and parallel roadways relocated. There will be **50 to 80 foot** wide private property impacts required to construct the tunnel portal walls offset from the freight tracks and relocate Progresso Drive.

## Tunnel Alternative: Typical Section

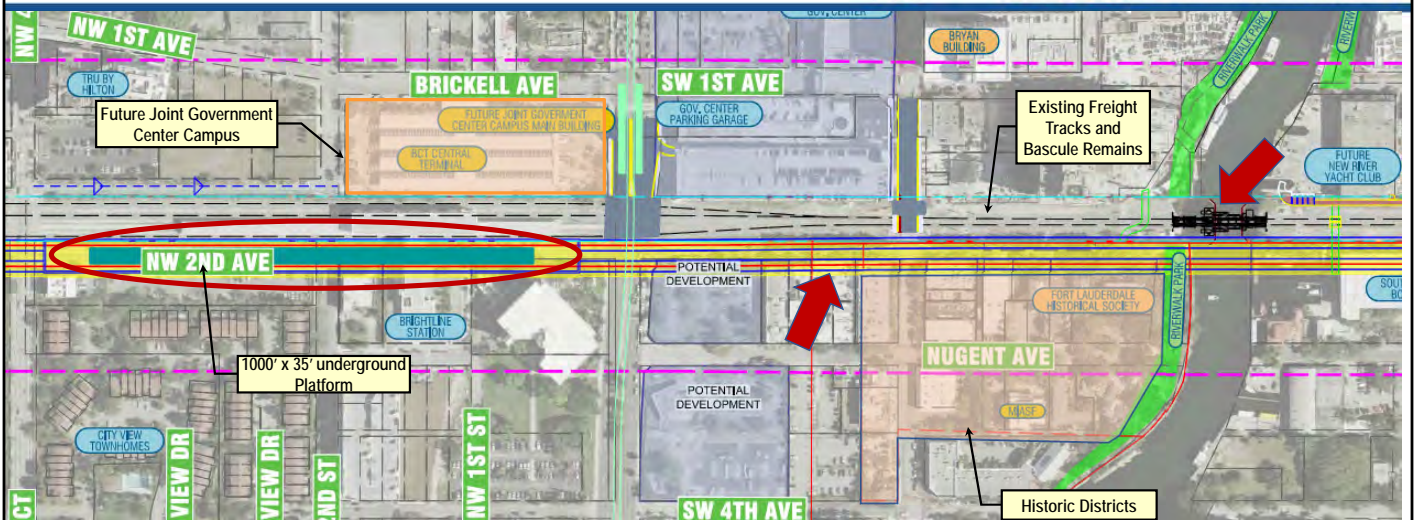
- ❑ Portal retaining walls
- ❑ No impacts to Flagler Avenue
- ❑ Progresso Drive shifts west
- ❑ Right of Way impacts – between 50' and 70' wide private property impact



This typical section is in the same area as the plan view and shows the portal walls north of Andrews Avenue with Progresso Drive shifted west. The wall height varies as the tunnel emerges from underground starting at 50 feet below ground. A 3 ½ feet high concrete barrier wall with a fence would be required for safety and might need to be higher for resiliency during flood events. The tunnel has the widest right of way footprint between 50 and 80 feet wide of private property impacts.

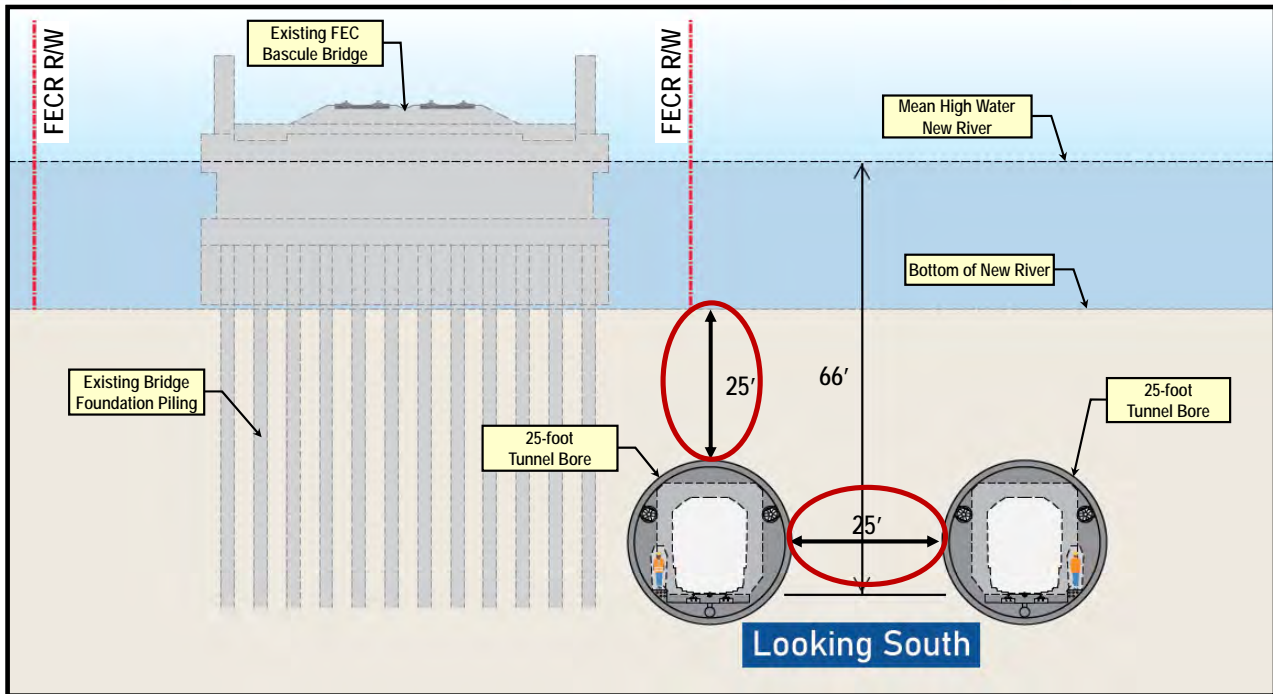


## Tunnel Alternative: Downtown Area



- Existing freight tracks and bridge remain
- Two commuter tracks proposed location set by offset to portal walls
- Underground Station requires open cut with deep support walls
- Reconstruction of the existing Brightline station
- ROW impacts – between the Portals, underground easements are anticipated (yellow)

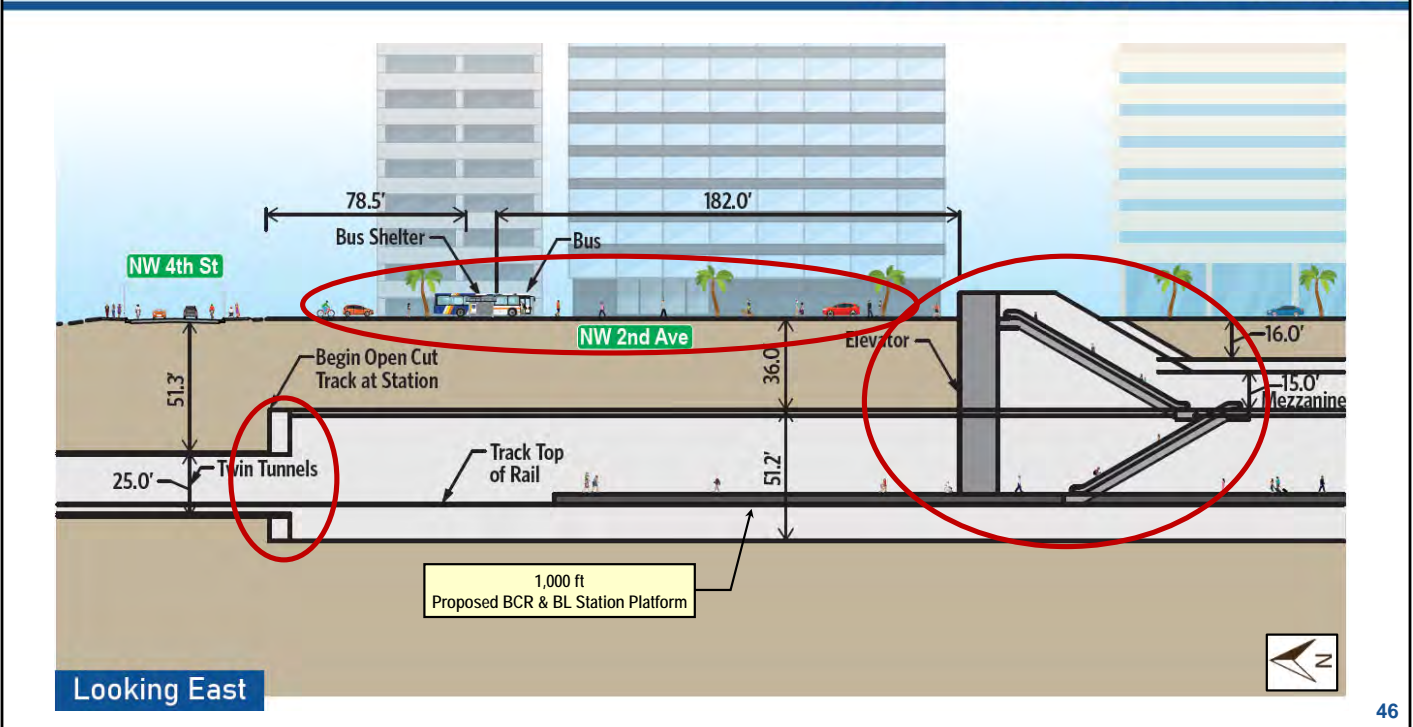
As with each of the bridge alternatives, the tunnel provides opportunity for station development in association with the **Future Government** Center Campus, or other potential developments, while avoiding impacts to the historic districts. Since the tunnel is bored underground, **the existing FECR** bascule bridge would remain in place. The station will be excavated using an open cut with deep support walls and covered back up after tunnel boring is complete. The Tunnel boring machine will start at one of the portals and push through into the station walls, continue and bore out the other portal. This alternative will require the **full reconstruction** of the existing Brightline station. As mentioned previously, there **are underground easements** anticipated between the portals. These areas are shown in yellow.



This is a cross section looking south of what the tunnel would look like at the New River, just west of the existing freight bascule bridge. The existing bridge is not planned to be relocated for the tunnel alternative. The tunnel is offset to the west because the tunnel cannot be bored without impacting the existing bridge piles.

The diameter of the tunnel bores are anticipated to be **25 feet wide** and are set 25 feet apart. The tracks themselves would be about 66 feet below the Mean high water. The tunnel is located primarily outside of the railroad right-of-way.

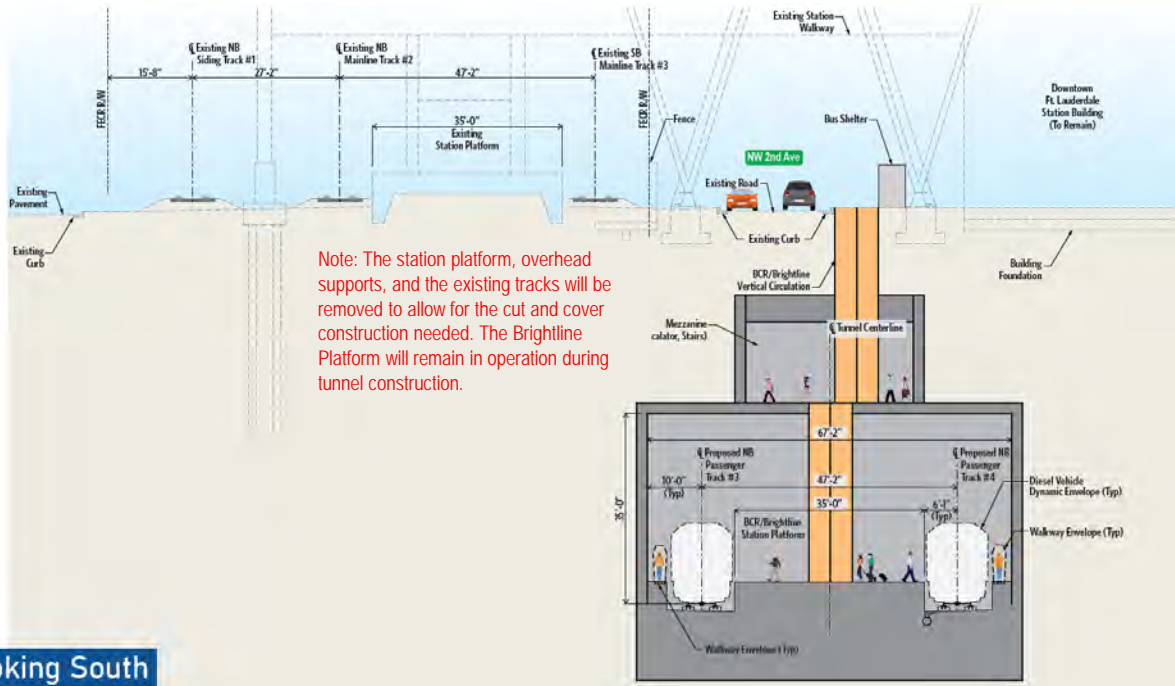
# Tunnel Alternative: Underground Station Elevation View



The Low-level alternative requires minor modifications to the existing Brightline station platform. The Mid and High-Level alternatives require an elevated platform above and connection to the existing Brightline station. As shown on this rendering, the tunnel alternative will require the reconstruction of the existing Brightline station under ground with both a commuter rail and Brightline platform. This elevation view shows the **bus stops and access point** at the street level with vertical circulation **via elevators**, escalators and stairs down to a mezzanine level and then a platform level. There are a number of additional safety measures required for an underground station. The **25 foot tunnel** bores will enter the station area as shown on the left. This station, similar to the Mid and High-Level alternatives, could be developed in conjunction with the joint Government Center which is planned adjacent to the site.



# Tunnel Alternative: Underground Station Section View

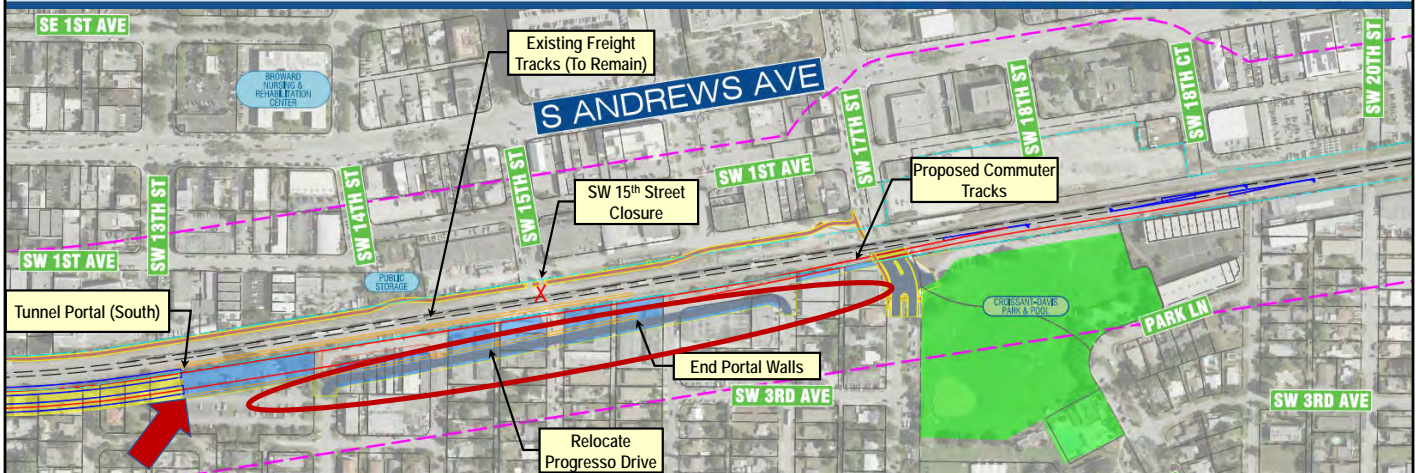


Note: The station platform, overhead supports, and the existing tracks will be removed to allow for the cut and cover construction needed. The Brightline Platform will remain in operation during tunnel construction.

Looking South

This is another section view of the underground station looking south showing the existing station platform at-grade, overhead supports and the existing tracks that will be removed to allow for the cut and cover construction needed to build the underground station. Temporary service for Brightline will be provided via a temporary platform.

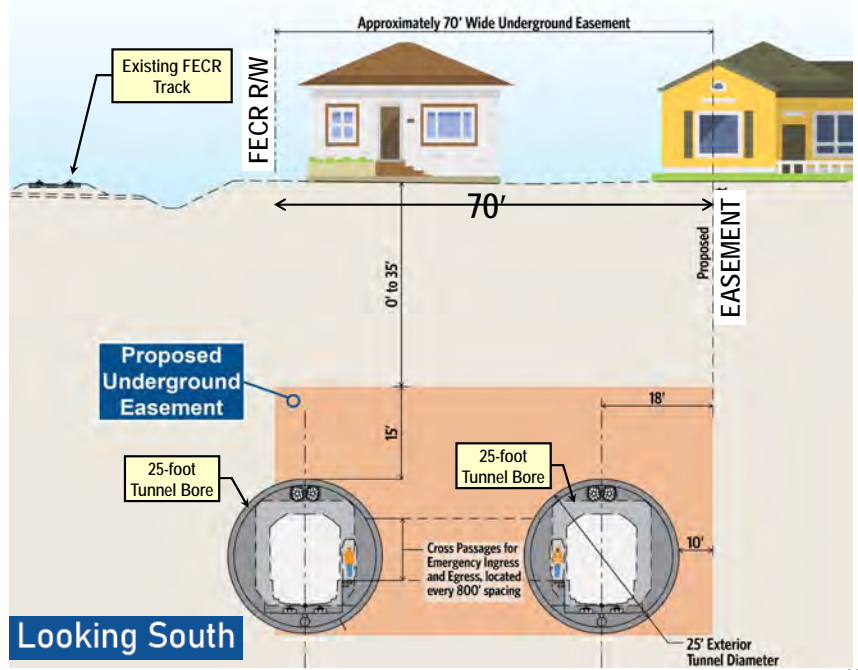
## Tunnel Alternative: South Portal Area



- Existing freight tracks remain
- Two commuter tracks proposed location set by offset to portal walls
- Portal Retaining walls with barrier and fence
- NE 5<sup>th</sup> Terrace connection at Sunrise Blvd closed
- SW 2<sup>nd</sup> Ave shifted west
- ROW impacts – between 50' and 80' wide private property need

Similar to the north portal, the **south portal area** maintains the two existing freight tracks and **proposes two** commuter tracks. The portal walls **are located** to the west and require the **shifting of** SW 2<sup>nd</sup> Ave between SW 14<sup>th</sup> and SW 16<sup>th</sup> Streets. There will be 50 to 80 foot wide property impacts on the west side.

- ❑ Private residential and industrial properties above tunnel
- ❑ The tunnel underground easement is anticipated to be 70' wide and extend 15' above the top of the tunnel
- ❑ The top of the underground easement varies between 0' and 35 feet under the property



Here is another example, south of the River, showing the tunnel located under private property. The potential need for underground easements may significantly increase the right-of-way cost of the tunnel alternative. An underground easement is anticipated to be 70-foot wide and extend 15-feet above the top of the tunnel. One of the things be evaluated as part of the alternative comparison is the right of way cost estimate.



### Bridge Alternatives

- ❑ Shift the Existing Freight bridge to the east
- ❑ Traditional Bridge Construction from the ground up
  - Foundation
  - Concrete pier pours and Girder placement with cranes during off peak traffic windows.
  - Typically performed with progressive crews or multiple crews / shifts
- ❑ Track work deliveries by rail then built from one end of the bridge to the other
- ❑ Downtown aerial station modifications tie into mid- and high-level bridges at platform level above existing station.
- ❑ Bridge construction impacts are fewer and less disruptive.
- ❑ A bridge can be built faster than a tunnel.

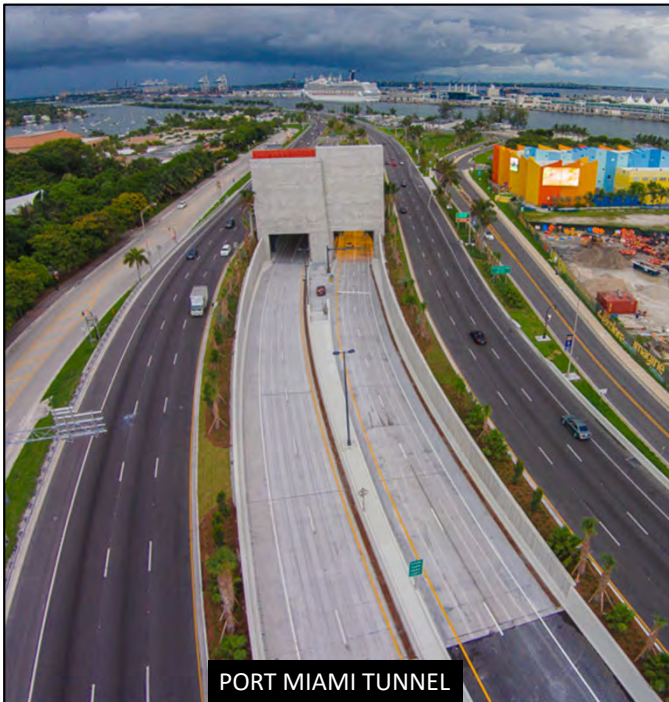
### Tunnel Alternative

- ❑ Extensive Laydown areas and dewatering
- ❑ Extensive conveyor systems for removal and treatment of excavated materials during tunneling with over 65,000 trucks hauling on City streets
- ❑ Build the portal walls and then Tunnel Boring Machine (TBM) bores the tunnel tubes
- ❑ Requires special geotechnical work due to Karst Limestone soils



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Some constructability comparisons between the bridge and tunnel alternatives include methods of construction, overall disruption or footprint, and duration of construction. For example, bridge construction utilizes traditional methods while tunnel boring and underground station work require extensive support facilities. The bridge construction builds the commuter rail bridge from the ground up, which is less disruptive than the tunnel portals have proven to be in Miami. The Tunnel Boring Machines (TBM) are specially built and are shipped from overseas and off loaded and hauled overland to the site. There is an extensive material waste conveyor system and treatment basin required during tunneling, in addition to dewatering. That material must be hauled offsite in more than 65,000 trucks over local streets. There are higher risks involved with building a tunneling project due to unknown soil stability issues that could be encountered, which drive cost overruns and delays.



- ❑ Tunnels are more challenging than bridges when addressing resiliency
  - Sea level rise
  - Hurricanes, storm surges
- ❑ Hurricane Sandy flooded NYC's subway system, taking weeks to restore and \$ billions in repairs + longer term infrastructure hardening measures
- ❑ Review of the NOAA high sea level curves
  - 54" by year 2070
  - 136" by year 2120
- ❑ Mitigation possible, but expensive
- ❑ Bridges can be shut down during severe storms, but normally do not suffer major damages as a result of flooding/storm surge, (unless foundations are unprotected and exposed to strong currents/erosion)

Resiliency is a consideration of this project. Tunnels are more challenging than bridges when addressing resiliency due to sea level rise and hurricane storm surges. Hurricane Sandy flooded New York City's subway system taking weeks to restore service and costing billions in repairs. There are long-term costs for infrastructure hardening measures such as floodgates and pump systems.

Review of the NOAA high sea level rise curves indicate 54 inches of sea level rise by year 2070 and 136 inches by year 2120. Mitigation is possible, but expensive. Bridges can be shut down during severe storms, but normally do not suffer major damages as a result of flooding or storm surge. Tunnels can be hardened and made resilient at additional costs.

- ❑ Roadway Traffic Analysis at:
  - Representative worst case railroad crossings on east-west roads
  - Proposed station locations
- ❑ Evaluation of Existing, No-Build, and Build Alternatives
- ❑ Step-By-Step Process
  - Identify traffic analysis locations and collect data
  - Estimate future traffic demand
  - Perform traffic operational analysis
    - Intersection's level of service
    - Queuing length analyses



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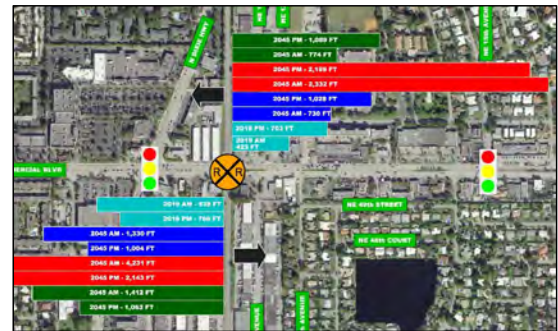
Two types of traffic analyses are being performed as part of the PD&E Study. The first one involves the railroad crossings on the east-west roadways and the second location is at the proposed station locations.

The PD&E Study is evaluating three scenarios: Existing Conditions, a future No-Build No-Construction condition, and a future Build condition.

The traffic analysis follows a step by step process that consists of identifying traffic analysis locations and collecting data, estimate future traffic demand, and perform traffic operational analysis.



- ❑ Total roadway closure time at each railroad crossing will be less than 90 seconds (advanced warning time + crossing time + clearance time)
- ❑ On average, 3 to 5 BCR Trains will traverse each crossing during the AM and PM peak hours on a typical weekday
- ❑ BCR Train travel times, delays, and queuing impacts along the railroad crossings are similar to the current Brightline service.
- ❑ At-grade railroad crossings will experience no significant change in intersections LOS, speeds, or queuing when compared to the No-Build Alternative
- ❑ Grade separated railroad crossings (Mid/High Level Bridge or Tunnel) will experience improved operating conditions when compared to the No-Build Alternative



The preliminary east-west roadways railroad crossing traffic analysis showed that the future total roadway closure time at each railroad crossing will be less than 90 seconds, which includes the advanced warning time, crossing time and clearance time. On average, 3 to 5 Broward Commuter Trains will traverse each crossing during the AM and PM peak hours on a typical weekday.

Broward Commuter Train travel times, delays and queuing impacts along the railroad crossings are similar to the current Brightline service. At-grade railroad crossings will experience no significant change in intersections level of service, speeds or queuing when compared to the No-Build Alternative.

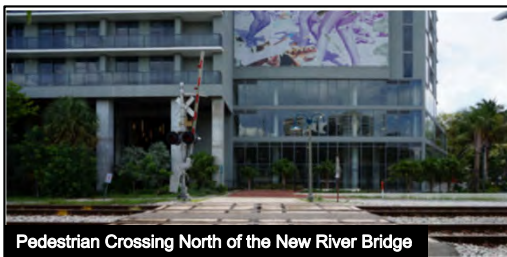
Within the New River Crossing area, the Mid Level Bridge, High Level Bridge and Tunnel crossing alternatives will experience improved operating conditions when compared to the Low Level Bridge Alternative and No-Build Alternative.

## □ Social Environment

- **Social Resources** – *Socio-Cultural Effects Evaluation being conducted*
- **Economic** – *Enhanced*
- **Land Use Changes** – *Minimal impacts*
- **Mobility** – *Enhanced*
- **Aesthetic Effects** – *Minimal impacts; Opportunities for enhancement*
- **Relocation** – *Few anticipated*
- **Recreational Section 4(f) (Parks and Preserves)** – *23 identified near project; potential impacts to Sistrunk Park (Mid and High-Level Bridge Alternatives)*

## □ Cultural Environment

- **Historic/Archaeological Resources** – *Clustered at New River, Surveys ongoing*
- **Coordination** – *State Historic Preservation Officer (SHPO) and Tribal Governments*
- **Documentation** – *Cultural Resources Assessment Survey (CRAS) Report*



Pedestrian Crossing North of the New River Bridge



Sistrunk Park

The PD&E Study is evaluating the potential impacts of each alternative to the Social, Cultural, Natural, and Physical Environments.

To address the social environment, the study is conducting a Socio-Cultural Effects Evaluation, which will produce a report highlighting the existing conditions, avoidance and minimization measures, and unavoidable impacts. It is anticipated that the project will enhance economics and mobility, have minimal changes to land use, require few property relocations and provide an opportunity for aesthetic enhancement. The study is also looking at any potential impacts to nearby parks and preserves especially for the mid- and high-level bridge alternatives with potential impacts to Sistrunk Park.

The cultural environment becomes of particular concern around the New River, where multiple historic and archaeological sites are clustered. The north bank of the New River, immediately west of the rail lines, contain some of the oldest historic structures in the county. A Cultural Resources Assessment Survey will be performed to document resources and potential impacts, and to support the required consultations with the State Historic Preservation Officer and tribal governments.

## □ Natural Environment

- **Wetlands** – *Limited impacts anticipated*
- **Protected Species** – *Coordination with FWC and USFWS*
- **Essential Fish Habitat** – *Not present in study area*
- **Water Resources** – *7 Water crossings and the Biscayne Sole Source Aquifer*
- **Floodplains** – *Minimal impacts anticipated*
- **Documentation** – *Natural Resources Evaluation Report*

## □ Physical Environment

- **Farmlands** – *No impacts anticipated*
- **Noise** – *Noise Study to measure noise-level increase*
- **Air Quality** – *Area in attainment for criteria pollutants*
- **Contamination** – *Addressed in Contamination Screening Evaluation*



Looking South at New River Bridge



Tarpon River

Because the project area is so heavily urbanized, there are relatively few Natural Resources. The study is mapping and assessing wetlands and protected species habitats, which will be documented in the Natural Resources Evaluation. FDOT will be coordinating with the Florida Fish and Wildlife Conservation Commission and the US Fish and Wildlife Service. There are 7 water crossings along the project and the presence of the Biscayne Sole Source Aquifer, which provides drinking water for the area.

In the Physical Environment, the study is closely examining potential noise impacts and will be conducting a noise study that models the decibel levels of the existing and proposed conditions. These results will be presented in a Noise Study Report. Contamination is another important concern and the study is evaluating the site histories which will be documented in a Contamination Screening Evaluation Report.



- ❑ Determine potential noise and vibration impacts for:
  - New commuter rail service along FEC Corridor
  - Proposed stations
  - Maintenance facility at Hialeah Rail Yard
- ❑ Evaluate sensitive sites such as residences, schools, libraries, parks, and places of worship
- ❑ Determine existing noise levels and sources
  - Perform short-term (1 hour) and long-term (24 hour) monitoring
- ❑ Predict future project noise and vibration levels and assess impacts
- ❑ Evaluate abatement options at potentially impacted sites
  - Review of existing Quiet Zones
  - Noise barriers
  - Specialized track support systems
  - Vehicle and wheel treatments



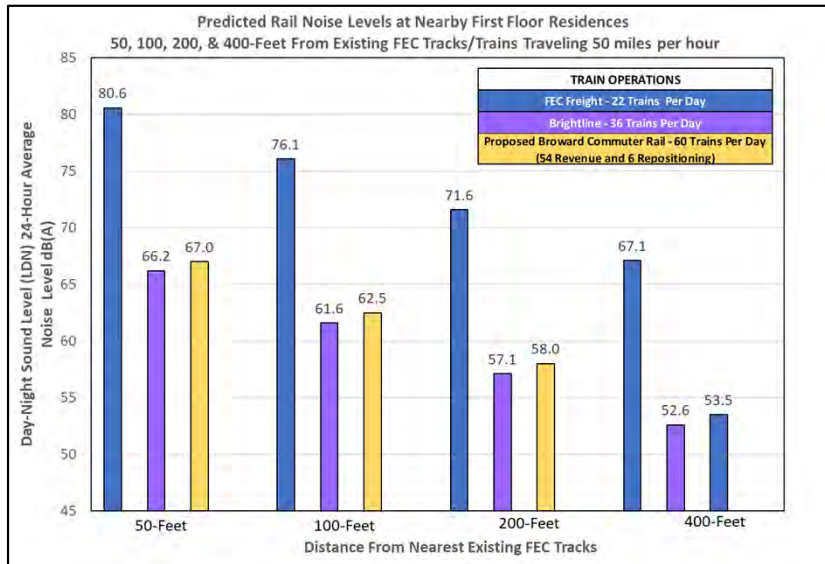
**Note:** Noise and Vibration Analyses are being performed in accordance with Federal Transit Administration and FDOT Guidelines.

Potential noise and vibration impacts are being analyzed as part of the PD&E Study. The analysis includes assessment of impacts associated with the new commuter rail service; the proposed stations; and the proposed maintenance facility.

The noise and vibration sensitive sites that will be evaluated for potential impacts include residences, schools, libraries, parks, and places of worship. Noise monitoring is being performed to determine existing noise levels and the sources of noise at representative sites along the project corridor. Future project noise and vibration levels will be predicted and compared to the impact criteria to determine the impacts.

Abatement options will also be evaluated for impacted sites including the review of existing quiet zones that were installed to minimize horn noise, potential noise barriers, use of specialized track supports, and the review of rail vehicle types and wheels. The noise and vibration analyses are being performed in accordance with Federal Transit Administration and FDOT Guidelines.

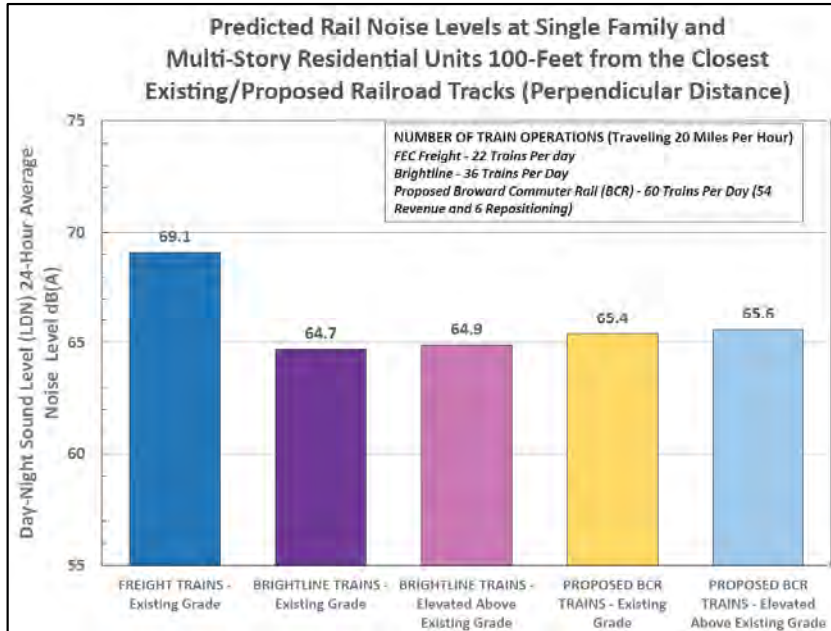
### Relative Comparison of Existing and Future Train Noise Levels Along Existing FEC Corridor



Average rail noise levels are dependent upon many factors including the type of trains, the number of train operations per day, distance from the tracks, intervening structures, and train speeds.

A relative comparison of existing noise levels at a nearby single-family residences at 50, 100, 200, and 400 feet from the tracks with trains traveling at 50 mph are shown on this slide. In general, noise levels decrease as the distance from the track increase, freight trains are much louder than the commuter rail train operations, and average noise levels associated with the Broward commuter rail train operations are similar to Brightline trains. Also, noise levels associated with freight trains generally increase with increasing train speeds while commuter trains having few rail cars actually decrease with increasing speeds.

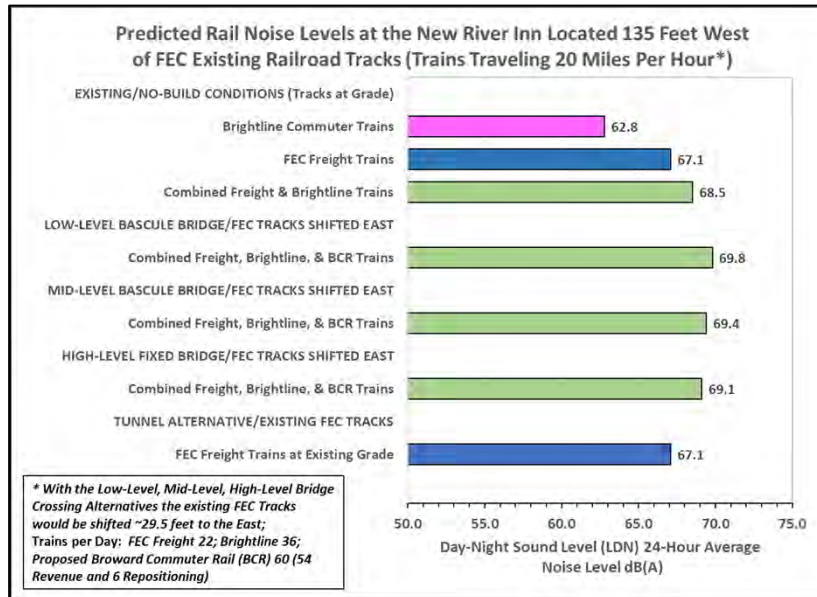
Relative Comparison of Train Noise Levels Adjacent to the FEC Railroad Corridor



This slide shows the average predicted rail noise levels at residences 100 feet from the tracks with trains traveling at 20 mph on existing at-grade tracks as well as on elevated tracks. In general, the commuter trains on elevated tracks have slightly higher-noise levels than the at grade tracks. However, the FEC freight trains at grade are noticeably louder than the commuter trains at grade or the elevated alternatives.



## New River Crossing Alternatives Relative Comparison of Train Noise Levels at New River Inn



The average noise levels at the New River Inn are shown for each of the New River Crossing Alternatives in comparison to the existing and no-build conditions for trains traveling at 20 mph.

For the three bridge alternatives with the existing freight tracks shifted to the east, the combined rail noise levels shown as green bars are slightly higher than the existing noise. The predicted average rail noise levels for the Tunnel Alternative shown at the bottom of the slide of 67.1 decibels is slightly lower than the three bridge crossing alternatives that range from 69.1 to 69.8 decibels. In general, the average noise levels from the commuter trains decrease slightly as the bridge heights increases.

- ❑ Proposed Right of Way – Purchase of full property rights of the area needed to construct, secure, and operate the Broward Commuter Rail
- ❑ Aerial Easement – Purchase of rights to construct, operate and maintain the Broward Commuter Rail above the property, that will allow the property owner to use the area below the structure overhang
- ❑ Underground Easement – Purchase of rights to construct, operate and maintain a tunnel below the property, that will allow the property owner to use the property above the tunnel

Description/Alternative	BCR Corridor		New River Crossing Alternatives							
			Low-Level Alternative		Mid-Level Alternative		High-Level Alternative		Tunnel Alternative	
Number of Properties Affected (Private Owners)	36		0		34		34		103	
Type of Property Impact	Number	Area (Acres)	Number	Area (Acres)	Number	Area (Acres)	Number	Area (Acres)	Number	Area (Acres)
Proposed Right of Way (Slivers) (From Private Owners)	36	7.5	0	0	32	2.4	32	2.4	58	5.1
Proposed Aerial Easements (From Private Owners)	0	0	0	0	8	0.3	11	0.3	0	0
Proposed Underground Easements	0	0	0	0	0	0	0	0	48	12.3

Throughout the workshop each alternative was presented, and various areas of right of way or easement needs were described. This is a summary table of the number of properties affected and a definition of the types of right of way required.

The Proposed Right of Way is the purchase of full property rights of the area needed to construct, secure, and operate the Broward Commuter Rail.

The Aerial Easement is the purchase of rights to construct, operate and maintain the Broward Commuter Rail above the property, that will allow the property owner to use the area below the structure overhang.

The Underground Easement is the purchase of rights to construct, operate and maintain a tunnel below the property, that will allow the property owner to use the property above the tunnel.

This table shows the breakdown of the private property right of way required for each of the New River Crossing Alternatives. The low level alternative does not have any private property needs, mid level and high level both consist of 34 affected properties, and the tunnel will have 103. The table also breaks down the proposed right of way, aerial easements, and underground easements for each alternative. The number of properties and the acreage needed are shown.

- ❑ Projection based on
  - FTA STOPS model for Design Year 2045
  - Developments approved in the MPO plans
- ❑ BCR ridership projected at 9,500 daily riders
- ❑ BCR and NE Corridor combined ridership of 24,000 (Broward and Miami-Dade)
- ❑ Compares favorably to other commuter rail systems in Florida (pre-COVID data)
  - Tri-Rail averages 14,900 daily riders as a mature system
  - SunRail averages 4,100 daily riders as a new system
- ❑ Ridership grows as development occurs and population density increases
- ❑ Function of stations and train frequency – balance between access and travel time
- ❑ Future stations can be added once BCR is operational, similar to Tri-Rail
- ❑ Project's cost-benefit ratio (cost per rider) is a key to obtaining federal funds



Ridership projection is based on the FTA STOPS model for design year 2045 given developments approved in the MPO plans. The BCR ridership is projected at 9,500 daily riders and the BCR and NE Corridor combined ridership is projected at 24,000.

These projections compare favorably to other commuter rail systems in Florida prior to COVID. Tri-Rail averages 14,900 daily riders as a mature system and SunRail averages 4,100 daily riders as a new system.

Ridership grows as development occurs and population density increases. It is a function of stations and train frequency both of which provide a balance between access and travel times. Future stations can be added once BCR is operational, similar to Tri-Rail. The Project's cost-benefit ratio is a key factor in obtaining federal funds.



□ The table below itemizes the different elements of the total project cost.

NRC Alternative Cost Table				
Alternative	Low-Level Bascule	Mid-Level Bascule	High-Level Fixed	Tunnel
New River Crossing	\$240 M	\$444 M	\$452 M	\$1.82 B
Right-of-Way (Private)	\$0	\$98 M	\$98 M	\$148 M
Operations & Maintenance <sup>1</sup>	- Bridge Tender - Mechanical Systems	- Bridge Tender - Mechanical Systems	- Regular Maintenance	- Underground Station - Ventilation Systems
Corridor Cost Table				
Corridor Capital Cost <sup>2</sup>	\$495 M			
Right-of-Way (Stations)	Under Analysis will be the same for each alternative			
Total Capital Cost	\$735 M	\$1.04 B	\$1.05 B	\$2.46 B
Other Project Cost Table				
Operations & Maintenance	\$18 - \$28 M	\$18 - \$28 M	\$17 - \$27 M	\$18 - \$28 M
Access Fee <sup>3</sup>	TBD			

<sup>1</sup> O&M costs are per year and are not calculated in the total cost. There are differences among the NRC alternatives , with the tunnel O&M costs expected to increase in the outer years.

<sup>2</sup> Capital Cost Includes Construction, Stations, Vehicles, Yards, Parking, etc.

<sup>3</sup> Access Fee - A negotiated fee to allow commuter trains on the Brightline passenger easement on the FEC corridor.

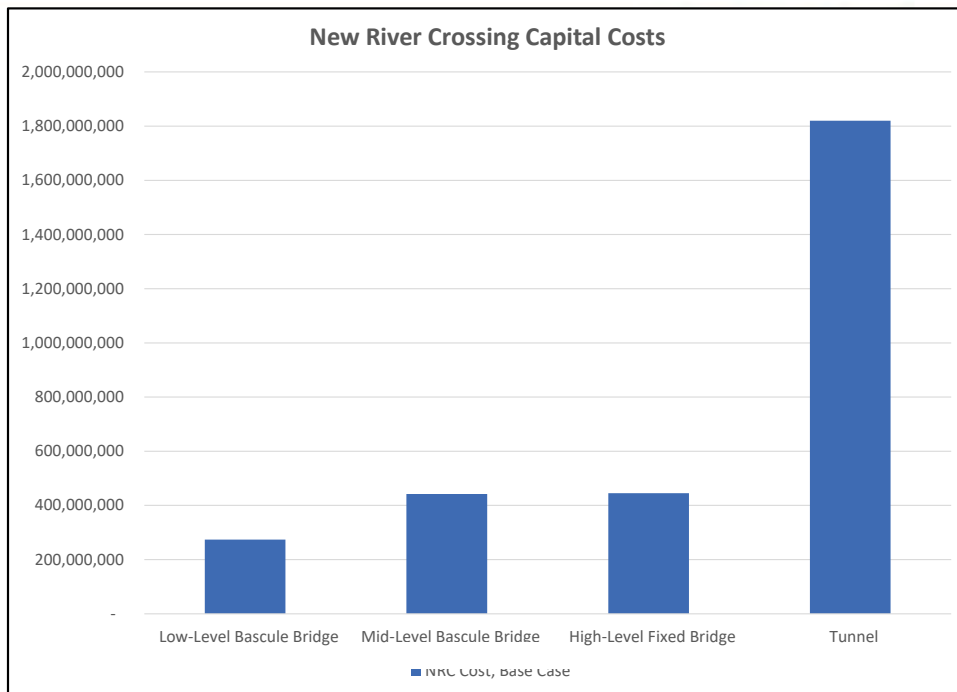
Preliminary cost estimates have been prepared for each New River Crossing alternative as well as the rest of the project corridor. These costs include capital cost, operations and maintenance, right of way acquisition, and corridor access fee and will be refined as the study progresses.

The preliminary capital cost estimate for the low level bascule bridge is \$240 million, the mid level bascule bridge is \$444 million, the high level fixed bridge is \$452 million, and the tunnel is \$1.82 billion dollars.

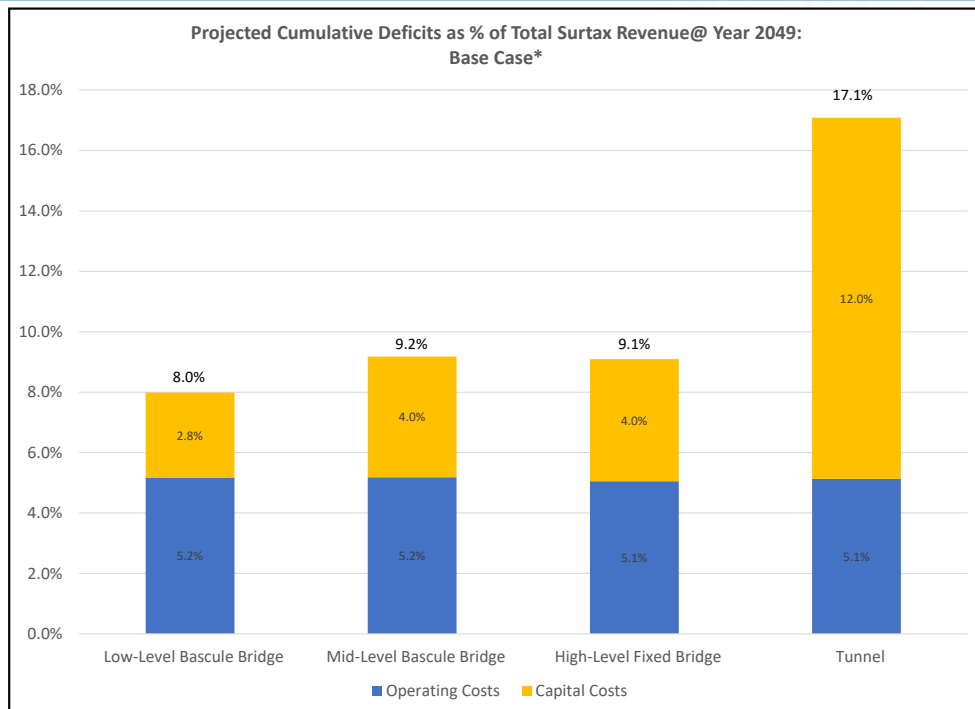
The preliminary capital cost estimate for the remainder of the 27 mile corridor is \$495 million.

Each alternative will carry a different operations and maintenance cost. The bascule bridges will require a full-time bridge tender and regular maintenance of the mechanical systems. The fixed bridge will require standard maintenance. The tunnel will require ongoing operations and maintenance of the underground station as well as the ventilation, systems, jet fans, sensors, lights, tunnel sealant, and the maintenance of the underground station.

The corridor access fee will be negotiated between Broward county and Brightline.



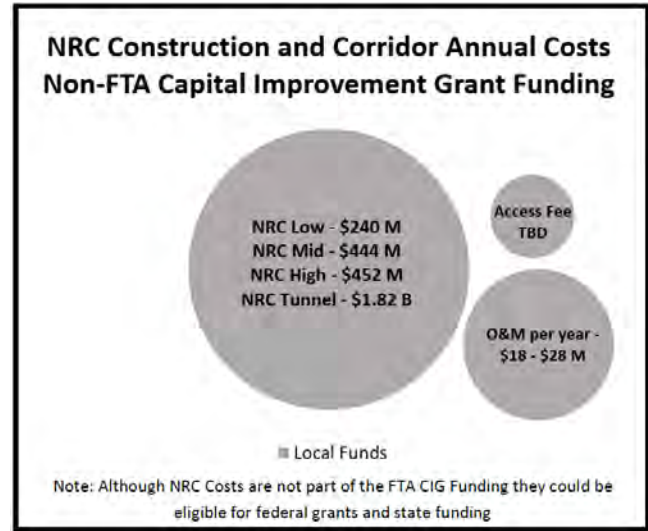
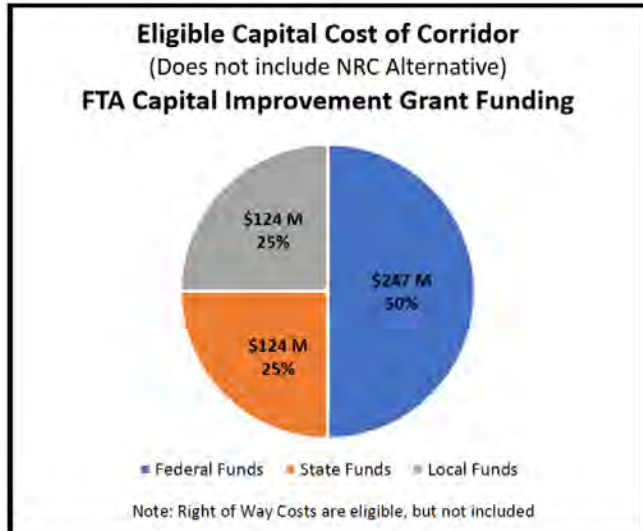
In summary, the capital costs for the new river crossing range from \$240 million for the low-level bascule bridge to \$1.82 billion for the tunnel in 2021 dollars. This excludes the capital cost of the rest of the Corridor.



This graphic illustrates the percentage of total Broward transportation surtax revenue that would be necessary to cover the cost of each alternative. The preliminary analysis estimates that the low level bascule bridge would require 8%, mid level bascule bridge 9.2%, high level fixed bridge 9.1%, and the tunnel 17.1% under a base case scenario.



- ❑ Capital Improvement Grant (CIG) funding is competitive, and the capital cost must meet FTA’s cost effectiveness requirements.
- ❑ Corridor cost is split funded (per the graphs below) and the NRC Capital Cost, Corridor Access Fee, and Operations and Maintenance are local responsibilities.



The Federal Capital Improvement Grant or CIG funding is competitive. Therefore, the capital cost must meet Federal Transit Administration’s cost effectiveness requirements for this project to be competitive. The new river crossing capital cost may not be included in the CIG request to Federal Transit Administration and may need to be funded separately.

As shown at left, the CIG funding generally provides up to 50% federal funds, which must be matched by 25% state funds, and a minimum 25% local funds.

Per the chart on the right, the new river crossing Capital Cost, Corridor Access Fee, and Corridor Operations and Maintenance costs are local responsibilities. Although the new river crossing costs may not be part of the Federal Transit Administration CIG funding, they could be eligible for federal grants and state funding.

## Hialeah Rail Yard

- ❑ Owned by FDOT
  - Occupied by CSX, Amtrak, and Tri-Rail
- ❑ Proposed For BCR Use
  - Storing and maintaining trains
  - 2 areas could accommodate BCR
  - Coordinating improvements needed for NE Corridor and BCR
- ❑ Potential Environmental Concerns
  - Title VI and Environmental Justice
  - Noise
  - Contamination/Stormwater treatment



The Hialeah rail yard is owned by FDOT and occupied by CSX, Amtrak, and Tri-Rail. BCR proposes to use this location for storing and maintaining trains. There are two areas which could accommodate the commuter rail and the necessary improvements will be coordinated as the study progresses.

The environmental components include Title six and environmental justice, noise, contamination, and stormwater treatment.

# NRC Alternatives Evaluation Matrix

- ❑ One or more of these alternatives will be evaluated against the No-Build Alternative during the NEPA environmental process.
- ❑ Subject to change: All categories will require further analysis as the project continues.

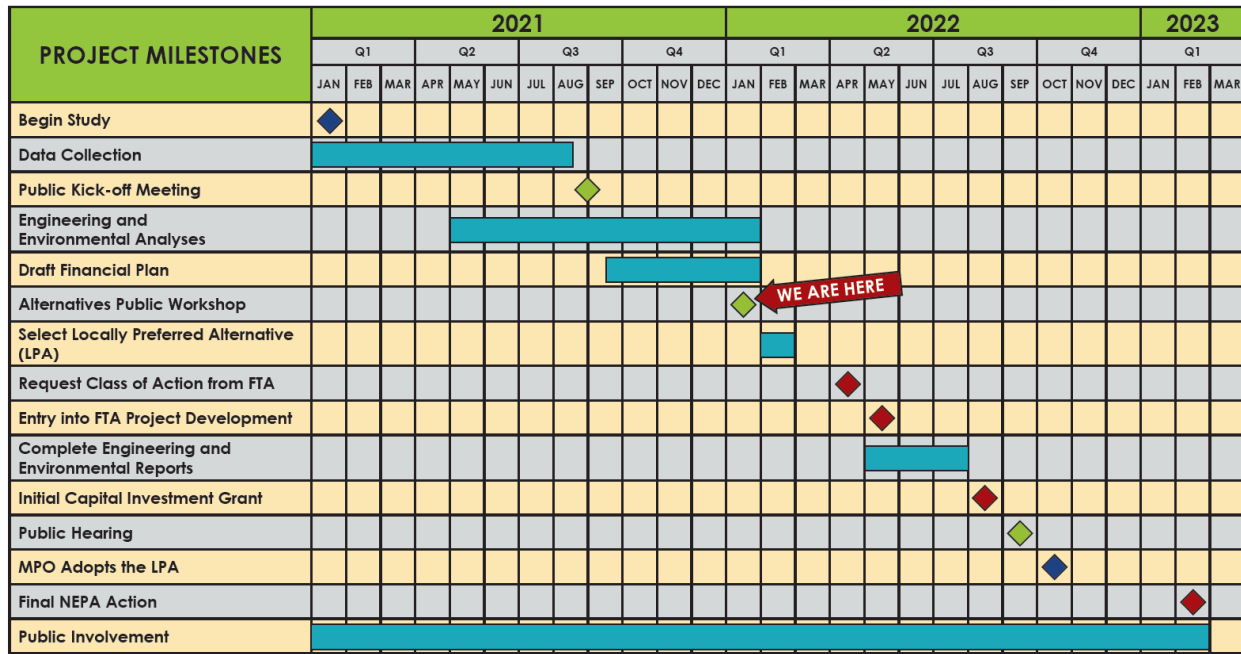
Evaluation Category	Low-Level Bascule	Mid-Level Bascule	High-Level Fixed	Tunnel
Navigational Accommodations	Worst	Better	Best	Best
Vehicular Traffic Operations	Worst	Better	Best	Best
Socio-Cultural Resources (Historic)	Better	Better	Best	Best
Contamination Risk	Best	Better	Better	Worst
Resiliency	Better	Best	Best	Worst
Right-of-Way Impacts	Best	Better	Better	Worst
Noise	Better	Better	Better	Best
Neighborhood Connectivity - Bicycle/Pedestrian/ Vehicle Local Connections	Better	Best	Best	Worst
Operations and Maintenance Costs (O&M)	Better	Better	Best	Worst
Capital Costs	See Cost Table on Slide 68			

Worst
Better
Best

To help compare alternatives, the study developed this preliminary qualitative evaluation matrix. This matrix will continue to be refined during the PD&E process, including incorporating feedback from this workshop. The evaluation categories are shown in the column on the left. The Low-level, Mid-Level, and High Level bridges as well as the tunnel are each rated on a relative basis from worst to best in each category.

A supporting document can be found on the website, which provide information utilized in the comparison of the alternatives.

# PD&E Study Milestone Schedule



■ General Project Tasks    
 ◆ Public Meetings    
 ◆ General Project Milestones    
 ◆ Critical Project Milestones

The PD&E study began in January of 2021 and is anticipated to be completed by early 2023. Over the next few weeks, the project team will finalize the recommendations regarding the locally preferred alternative. The Broward County commission is scheduled to choose a locally preferred alternative in February 2022 followed by MPO endorsement of the LPA later this spring.

Following the selection of the locally preferred alternative, the project team will request entrance into the Federal Transit Administration project development phase to complete the NEPA environmental study and apply for federal funds.



FDOT has been and will continue to hold meetings with the public, agencies, and stakeholders throughout the entire study

Public Meetings

- Public Kick-off Meeting – August 31, 2021
- Alternatives Public Workshop – **Tonight's Meeting**
- Broward County Commission LPA Vote – February 22, 2022
- Public Hearing – Anticipated Summer 2022

Other Meetings

- Small Group Meetings
- One-on-One Stakeholder Meetings
- NRC Workshop – November 18, 2021
- County and City Commission Meetings
- Metropolitan Planning Organization (MPO) Board and Committee Meetings

Newsletters

Project Website

[www.browardcommuterrailstudy.com](http://www.browardcommuterrailstudy.com)

Social Media

@ MyFDOT\_SEFL MyFDOTSEFL



Two public meetings and a Public Hearing will be held with the public, local officials, interested agencies and stakeholders. These public meetings and the Public Hearing will provide information regarding the project’s status and seek public input. Today, we are holding the Alternatives Public Workshop.

Small group meetings and or one-on-one stakeholder meetings are being held with nearby neighborhoods, homeowner associations, civic organizations, public officials, and other stakeholders throughout the study. The New River Crossing Workshop was held on November 18, 2021. Other meetings will include the Metropolitan Planning Organization Board and committee meetings. The intent of these meetings is to present the latest project information and to provide opportunities to discuss specific issues and or concerns.

Three project newsletters are being prepared for the study. These Newsletters are being distributed at the public meetings and on the project website.

The project website for the study includes pertinent information about the project. The project website is another way for the public to communicate with the project team and provide input and comments.

1. Place a completed comment form in the comment box provided here tonight
2. Email your comments to: [Phil.Schwab@dot.state.fl.us](mailto:Phil.Schwab@dot.state.fl.us)
3. Mail your comments to : Florida Department of Transportation, District Four  
3400 West Commercial Boulevard  
Fort Lauderdale, FL 33309
4. Submit comments on project website: [www.browardcommuterrailstudy.com](http://www.browardcommuterrailstudy.com)



For today's meeting, your comments can be provided in four ways.

You may place a completed comment form in the comment box provided here tonight.

You may email your comments to the FDOT project manager.

You may mail written comments to the FDOT project manager at the address shown.

Or you may submit comments on the project website.

1. Review exhibits on display here tonight
2. Visit the project website: [www.browardcommuterrailstudy.com](http://www.browardcommuterrailstudy.com)
3. Attend upcoming public meetings
4. Discuss the project with FDOT personnel



For more detailed information, you may review the exhibits on display here tonight, visit the project website, and attend upcoming public meetings. FDOT personnel will be available to discuss the project and answer your questions.

Project Website

[www.browardcommuterrailstudy.com](http://www.browardcommuterrailstudy.com)

Documents	Date
<a href="#">Kickoff Meeting Exhibits</a>	December 2021
<a href="#">Probable Tunnel Construction Cost Estimate</a>	December 2021
<a href="#">2021-11-18 New River Crossing Workshop Presentation Aesthetics</a>	November 2021
<a href="#">2021-11-18 New River Crossing Workshop Presentation Introduction</a>	November 2021
<a href="#">2021-11-18 New River Crossing Workshop Presentation Multimodal Connectivity</a>	November 2021
<a href="#">2021-11-18 New River Crossing Workshop Presentation Navigational Concerns</a>	November 2021
<a href="#">2021-11-18 New River Crossing Workshop Presentation Summary and Next Steps</a>	November 2021
<a href="#">2021-11-18 New River Crossing Workshop General Q&amp;A Interactive</a>	November 2021
<a href="#">2021-11-18 New River Crossing Workshop Pedestrian &amp; Bicycle Facilities Map</a>	November 2021
<a href="#">November 2021 Newsletter #2</a>	November 2021
<a href="#">Broward Commuter Rail PD&amp;E Public Kickoff Meeting - Virtual Session #2</a>	September 2021
<a href="#">Broward Commuter Rail PD&amp;E Public Kickoff Meeting - Virtual Session #1</a>	September 2021
<a href="#">Public Kick-off Meeting Exhibit Room</a>	August 2021
<a href="#">Preliminary Station Area Summary</a>	August 2021
<a href="#">Newsletter #1</a>	August 2021
<a href="#">Broward County Board of County Commissioners Presentation</a>	January 2021

Exhibits were prepared for this workshop to present additional detailed information about the project and the PD&E Study. These exhibits can be viewed and downloaded from the project website [www.browardcommuterrailstudy.com](http://www.browardcommuterrailstudy.com) by clicking the Documents and Publications link and scrolling down to Alternatives Public Workshop.



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If you would like to obtain additional project information, please contact the FDOT's Project Manager, Phil Schwab, by phone at 954-777-4524 or by email at [phil.schwab@fdot.state.fl.us](mailto:phil.schwab@fdot.state.fl.us). You may also contact the Consultant PD&E Project Manager, Mike Ciscar, by phone at 954 777-0044 or by email at [mciscar@corradino.com](mailto:mciscar@corradino.com)



**BE ALERT.  
BE PREPARED.  
*BE READY  
TO STOP.***



Before we conclude this presentation, the department wants to share its railroad safety campaign, Operation STRIDE.

Operation STRIDE, which means Statewide Traffic and Railroad Initiative using Dynamic Envelopes, was established by FDOT in December 2019 and includes engineering countermeasures, education, and enforcement efforts to provide a comprehensive strategy to prevent fatalities.

So please be alert, be prepared, and be ready to stop near railroad tracks.



**BROWARD COMMUTER RAIL (BCR)**  
**PROJECT DEVELOPMENT & ENVIRONMENT (PD&E) STUDY**

FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT), DISTRICT 4  
BROWARD COUNTY, FLORIDA • FPID: 448942-1



**Thank You**

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This concludes our project presentation. Thank you for attending today’s alternatives public workshop. We will now be available to answer questions related to the project.