



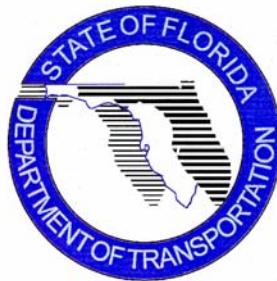
TRAFFIC AND TRANSIT OPERATIONS

TECHNICAL MEMORANDUM

CENTRAL BROWARD EAST-WEST TRANSIT ANALYSIS BROWARD COUNTY, FLORIDA

FINANCIAL PROJECT ID NUMBER 411189-2-22-01

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT 4



PREPARED BY:

Carter Burgess

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1.0 Introduction

This technical memorandum summarizes a conceptual review of:

- Traffic operations at roadway intersections where the alignment turns north/south to east/west and vice versa along the proposed alignment for the Locally Preferred Alternative (LPA)
- Transit operations necessary to ensure equivalency between the Transportation System Management (TSM) alternative and the LPA.

2.0 Traffic Operations at Intersections

The alignment makes a significant change in direction (north to east, south to west, etc.) at these locations:

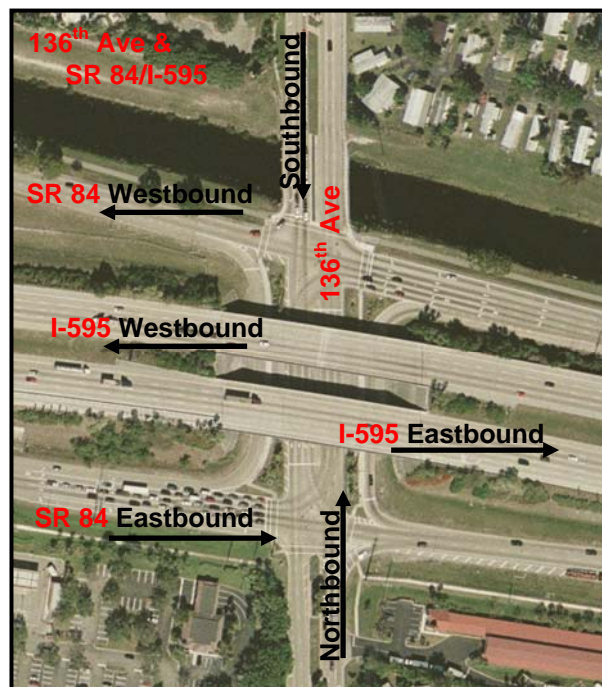
1. Intersection of 136th Avenue and SR 84/I-595
2. Interchange of I-595 and SR 7
3. Intersection of Broward Boulevard and SR 7
4. Intersection of Broward Boulevard and Andrews Avenue
5. Intersection of SE 30th Street and Andrews Avenue
6. Intersection of SW 30th Street and US-1

The roadway segments approaching these intersections (except the intersection of SE 30th and Andrews Avenue) are projected to exceed the adopted level of service in 2025.

Given the conceptual nature of design at this stage of the study a qualitative evaluation of the potential impacts to automobile traffic due to interruptions caused by the transit system was performed. During the subsequent design phase, detailed data on turning movements, queue lengths, cycle times will be collected. Various lane configurations and cycle time synchronization, and options for ITS improvements will be tested using traffic simulation models. This next phase analysis will enable all stakeholders to identify an optimal solution both from planning and engineering standpoints.

2.1 Intersection of 136th Avenue and SR 84/I-595

The LPA for the 136th Avenue area is proposed to be a semi-exclusive, at-grade guideway located on the western edge of the roadway. The proposed configuration within the I-595 corridor is elevated. Due to this and other physical constraints (height limitations at the I-595 overpass, ramp modifications and reversible lanes in the median of I-595), the guideway will transition from at-grade to elevated, starting north of I-595 on 136th Avenue. At the intersection, the guideway will have to be at a sufficient height to allow for the required clearance of vehicles traveling on I-595. Therefore, this grade separation would result in no impact to automobile traffic



traveling through the intersections of 136th Avenue with SR 84 and I-595.

2.2 Interchange of I-595 and SR 7

The guideway as proposed would generally follow the northbound egress ramp from I-595 onto SR 7, which is grade separated from the vehicles traveling north and south on SR 7. Due to this separation, there would be no impact to traffic operations through the interchange. During the preliminary engineering phase, an analysis of the impacts to traffic on SR 7 will be conducted if the guideway is located at-grade. (An elevated guideway along SR 7 would have little to no impact on traffic flow.)

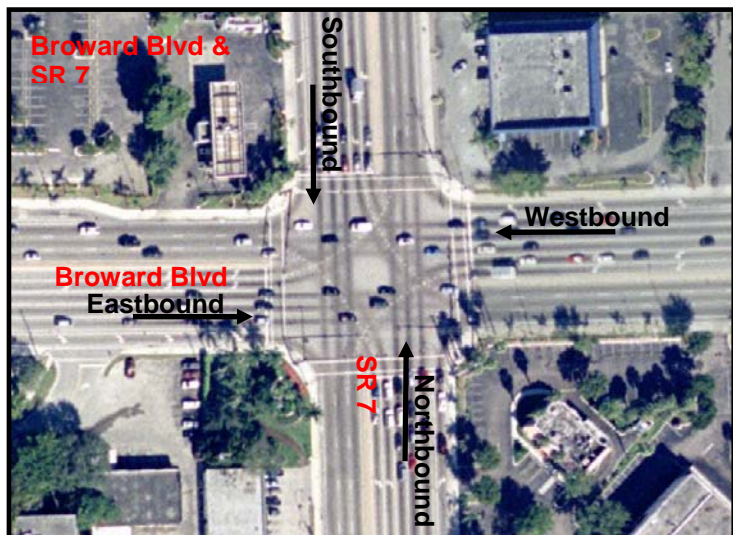


One area of potential conflicts between general purpose traffic and transit vehicles would be where the northbound transit guideway crosses or merges with northbound ramps and traffic lanes. An elevated guideway would minimize the potential for the conflict.

2.3 Intersection of Broward Boulevard and SR 7

On SR 7 the two guideway configurations are exclusive (elevated) or mixed-traffic (either shared or exclusive curb lanes). The configuration on SR 7 will affect the configuration on Broward Boulevard, which is also exclusive (elevated) or mixed-traffic (either shared or exclusive curb lanes). The lane configuration at this intersection is as follows:

- Three through lanes, two left turn lanes and one right turn lane in both the eastbound and westbound directions of Broward Blvd.
- Three through lanes, two left turn lanes and one right turn lane in both the northbound and southbound directions of SR 7.



If the guideway is elevated, there would be no conflicts with vehicular turning movements because automotive and transit traffic would be operating in exclusive, grade-separated facilities.

If the mixed traffic (at-grade) option is selected, operations at this intersection could be impacted and some lane configuration and signal timing adjustments may be required.

- For the transit vehicle traveling north on SR 7 and turning east onto Broward Boulevard, the right turn lane may have to be reconfigured to allow for the turning

radius of the transit vehicle. If the transit vehicle remains in the right lane, the southeastern corner of the intersection may require a larger radius to allow the transit vehicle to perform this maneuver. Since transit vehicles have various turning radius requirements, it is difficult to estimate right-of-way impacts in this scenario at this time. There are other designs that could allow for the transit vehicle to make this turn without impacting the lane configuration. For example, if the transit vehicle moves into the adjacent lane (to the west) prior to making the eastbound turn, it may be able to stay entirely within the existing roadway. This would require modifications to the traffic signal and the pavement markings for vehicular traffic, which would have to be stopped further back from the existing signal to allow the transit vehicle to make the move into the adjacent lane. If this scenario occurs, the details of the signal and pavement marking modifications would be determined during the preliminary engineering phase, as there are a variety of factors to consider, including the type of transit vehicle used. The impacts to right-of-way and vehicular traffic of both of these and other potential scenarios will be assessed during the preliminary engineering phase of the project.

- For the transit vehicle traveling west on Broward Boulevard and turning south onto SR 7, there is potential to negatively affect performance of the intersection. When the transit vehicle is making this movement, all vehicular traffic through the intersection would have to be stopped (excluding north- and southbound right turns from SR 7 onto Broward Boulevard).

2.4 Intersection of Broward Boulevard and Andrews Avenue

The guideway configurations at this intersection are the same on Broward Boulevard as at the intersection with SR 7, exclusive (elevated) or mixed-traffic. The guideway configurations for Andrews Avenue are the same. The lane configurations for this intersection are as follows.

- Three through lanes and one left turn lane in both the eastbound and westbound directions of Broward Boulevard. An exclusive right turn lane is present in the westbound direction.
- Two through lanes with one left turn lane in both the northbound and southbound directions of Andrews Avenue.



If the guideway is elevated, there would be no conflicts with automobile traffic because automotive and transit traffic would be operating in exclusive, grade-separated facilities.

If the mixed traffic (at-grade) option is selected, operations at this intersection could be impacted and some lane configuration and signal timing adjustments could be required.

- For the transit vehicle traveling west on Broward Boulevard and turning south onto Andrews Avenue, the right turn lane may have to be reconfigured to allow for the

turning radius of the transit vehicle. If the transit vehicle remains in the right lane, the southwestern corner of the intersection may require a larger radius to allow the transit vehicle to perform this maneuver. Since transit vehicles have various turning radius requirements, it is difficult to estimate right-of-way impacts in this scenario at this time. There are other designs that could allow for the transit vehicle to make this turn without impacting the lane configuration. For example, if the transit vehicle moves into the adjacent lane (to the north) prior to making the eastbound turn, it may be able to stay entirely within the existing roadway. This would require modifications to the traffic signal and the pavement markings for vehicular traffic, which would have to be stopped further back from the existing signal to allow the transit vehicle to make the move into the adjacent lane. If this scenario occurs, the details of the signal and pavement marking modifications would be determined during the preliminary engineering phase, as there are a variety of factors to consider, including the type of transit vehicle used. The impacts to right-of-way and vehicular traffic of both of these and other potential scenarios will be assessed during the preliminary engineering phase of the project.

- For the transit vehicle traveling north on Andrews Avenue and turning west onto Broward Boulevard, the potential to impact the intersection is high. When the transit vehicle would make this movement, all vehicular traffic through the intersection would have to be stopped (excluding east- and westbound right turns from Broward Boulevard onto Andrews Avenue).

2.5 Intersection of SE 30th Street and Andrews Avenue

The guideway configuration for both Andrews Avenue and SE 30th Street is mixed-traffic. This location is an unsignalized T-intersection. The lane configurations are as follows:

- Two through lanes in both the north- and southbound directions of Andrews Avenue and one left turn lane in the southbound direction.
- Two approach lanes (one left turn and one right turn) on SE 30th Street.

Reduction in the intersection level of service is likely to occur. If the resulting level of service is unacceptable, the intersection could be signalized and timed to increase its capacity. A signal may be required in this location for safety reasons. Furthermore, a reconfiguration of the eastbound to northbound radius may be required to accommodate the transit vehicle as it travels from SE 30th Street to Andrews Avenue.



2.6 Intersection of SE 30th Street and US-1

The transit guideway configuration at this T-intersection is mixed-traffic (at-grade in curb lanes) on SE 30th Street and exclusive (at-grade in the median) on US-1. The lane configurations are as follows:

- SE 30th Street provides two lanes approaching US-1, with one right turn lane and one left turn lane.
- US-1 has four through lanes in each direction and one exclusive left turn lane in the northbound direction. The median is sufficient in width to accommodate the transit guideway.



This intersection is anticipated to operate adequately with the transit system in place. There is excess capacity in this area (on the eight lane arterial), and the location of the transit guideway in the median of US-1 means that only southbound traffic would be interrupted.

3.0 Transportation System Management (TSM) Alternative

To be consistent with the Federal Transit Administration’s requirements, the following Transportation System Management (TSM) alternative was developed to ensure that the same market served by the proposed build alternative would be equally served by the TSM alternative. The proposed TSM alternative is comprised of the “existing + committed” network, the transit elements as described in the Broward County MPO’s 2030 LRTP, and a set of express bus routes and park-and-ride facilities that are designed to serve the same travel markets as the proposed Central Broward East-West Transit Analysis LPA. The proposed TSM alternative was developed in consultation with staff members of Broward County Transit (BCt), the Broward County MPO and District 4 of the Florida Department of Transportation and reviewed by FTA staff. This network of park-and-ride facilities and express bus services, primarily along I-595, would provide a level of service to, and serve the same travel markets as the proposed LPA.

Express Route #1

From the Sawgrass Mills park-and-ride, the Express Route #1 bus would proceed to Sawgrass Expressway to I-595, then utilize the reversible lanes in the median of I-595 to I-95 and continue to north on I-95, exiting at Broward Boulevard, stopping at the Broward County Transit Central Terminal in downtown Fort Lauderdale, then continuing south on Andrews Avenue to 30th Street, and then using US1 to reach the planned Intermodal Center at the Fort Lauderdale /Hollywood International Airport. The headways for Express Route #1 would be 10 minutes in the peak periods and 30 minutes in the off-peak. Departures of the Express Route #1 would be staggered with Express Route #3 runs.

Express Route #2

In order to serve potential riders east of I-75, a series of park-and-ride facilities would be established at major arterial streets that cross I-595. Since there would be no access to the reversible lanes in the median of I-595, east of I-75, the Express Route #2 buses would operate

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within the general-purpose lanes of I-595. The route would start at a park-and-ride facility in the vicinity of Sawgrass Mills mall. The route would follow 136th Avenue south, stopping at the Sawgrass Corporate Park, to I-595. The route would then travel east on I-595 to SR 7, with stops at the other park-and-ride facilities at Flamingo Road, Pine Island Road, and College Avenue. The College Avenue stop would provide a connection to shuttle service to the South Florida Educational Center (SFEC). It is assumed that the shuttle would be paid for, if not operated by the SFEC Transportation Management Association. The route would then turn north on SR 7, stopping to connect to the Transit Bridge service, and then continue north to Broward Boulevard where it would turn east to access the Tri-Rail station at I-95 and various other stops along Broward Boulevard. From there, the route would continue east to the Broward County Transit Central Terminal in downtown Fort Lauderdale, then continuing south on US1 to reach the planned Intermodal Center at the Fort Lauderdale /Hollywood International Airport. Headways would be 10 minutes in the peak; 30 minutes in the off-peak, coinciding with the departure times of Route #1.

Express Route #3

The Express Route #3 bus would start at a park-and-ride facility in the vicinity of Sawgrass Mills mall. The route would follow 136th Avenue south, stopping at the Sawgrass Corporate Park, to I-595. The route would then travel east on I-595 to SR 7, with stops at the other park-and-ride facilities at Flamingo Road, Pine Island Road, and College Avenue. The College Avenue stop would provide a connection to shuttle service to the South Florida Educational Center (SFEC). It is assumed that the shuttle would be paid for, if not operated by, the SFEC Transportation Management Association. The route would then turn south on SR 7, stopping to connect to the Transit Bridge service, and then continue south to Griffin Road where it would turn east to access the Tri-Rail station at I-95. From there, the route would follow Griffin Road to US 1 where it would connect to the planned Intermodal Center at Fort Lauderdale/Hollywood International Airport. This express route would operate on 10-minute headways in the peak period and with 30-minute headways in the off-peak. Departures of the Express Route #3 would be staggered with Express Route #1 runs.