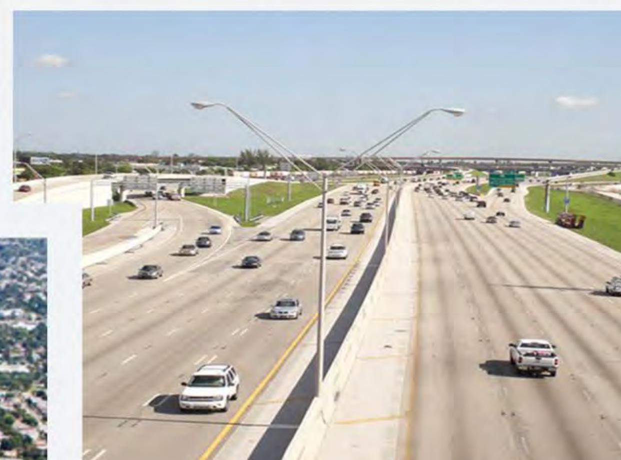
SR 9 / I-95 PD&E STUDY

FROM STIRLING ROAD (MP 5.093) TO NORTH OF OAKLAND PARK BOULEVARD (MP 13.742)

FM 429804-1-22-01 / ETDM 13168

BROWARD COUNTY, FLORIDA

PRELIMINARY ENGINEERING REPORT



September, 2013

PREPARED FOR:
FDOT - District 4
3400 West Commercial Boulevard
Fort Lauderdale, FL. 33309

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Prepared for:

Florida Department of Transportation – District 4
3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309

Prepared by:

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I hereby certify that I am a registered professional engineer in the State of Florida practicing with Stantec Consulting Services, Inc., a corporation, authorized to operate as an engineering business (EB 27013), FEID No. 11-2167170, by the State of Florida, Department of Professional Regulation, Board of Professional Engineers, and that I have reviewed or approved the evaluation, findings, opinions, conclusions, or technical advice hereby reported for:

Project:	SR 9/I-95 Project Development and Environment (PD&E) Study from Stirling Road (SR 848) to North of Oakland Park Boulevard (SR 816)
FPID:	429804-1-22-01
ETDM:	13168
FAP:	N/A
Location:	Broward County, Florida
Client:	Florida Department of Transportation District 4

This preliminary engineering report contains detailed engineering information that fulfills the purpose and need for the SR 9/I-95 Project Development and Environment (PD&E) Study from Stirling Road (SR 848) to Oakland Park Boulevard (SR 816) (FPID 429804-1-22-01). I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering and planning as applied through professional judgment and experience.

Name: Silvia M. Beltre, P.E.

Signature: Silvia M Beltre

P.E. Number: 51295

Date: 9/3/13

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1.0 SUMMARY OF PROJECT

This Preliminary Engineering Report contains detailed engineering information that fulfills the purpose and need for the Interstate 95 (SR 9/I-95) Project Development and Environment (PD&E) Study from Stirling Road (SR 848, Mile Post 5.093) to north of Oakland Park Boulevard (SR 816, Mile Post 13.742) in Broward County, Florida.

1.1 Project Background

I-95 is one of the most important surface transportation facilities along the east coast of Florida as it provides for the movement of goods and people within the 12 coastal counties, including Miami-Dade, Broward and Palm Beach Counties. Over the past few decades, these three counties have experienced tremendous demographic growth which has translated into traffic volumes exceeding 250,000 vehicles per day along several segments of I-95 within the tri-county area. These high volumes have brought congestion during the peak hours on I-95 to unacceptable levels.

Preserving mobility within the corridor is of prime concern to Florida. In September 2003, the Florida Department of Transportation (FDOT) finalized a master planning study for the I-95/I-595 corridors and the South Florida Rail Corridor (SFRC), which evaluated the existing deficiencies and recommended possible future improvements along these corridors.

The Locally Preferred Alternative (LPA) from the master plan study, within the PD&E study limits, consisted of the following improvements:

- Widen I-95 in Broward County to eight general purpose lanes plus two HOV lanes with auxiliary lanes as needed (I-95 within the limits of this Study from Stirling Road to Oakland Park Boulevard already has eight general purpose lanes)
- Interchange improvements

In 2007, the FDOT began a PD&E study for the segment of I-95 from Oakland Park Boulevard to Glades Road (FM #409359-1 and #409355-1) to evaluate in detail the LPA recommendations from the master plan. A year into the study, the travel demand forecasting efforts were completed and showed that adding an additional general purpose lane in each direction within the study limits would not improve the existing and future operations of the corridor. The additional lanes were not expected to accommodate the projected travel demand and growth along the corridor. Therefore, the FDOT placed the study on hold and returned to the planning phase to evaluate other possible concepts that could address the anticipated high demand and growth corridor wide.

Late in 2007, the FDOT completed the Managed Lanes Comprehensive Traffic and Revenue Study, which evaluated the potential operations of the corridor with the implementation of two tolled express lanes in each direction. The study determined that the improvements will offer potential time savings of up to 38 minutes during peak travel periods by providing continuous express lanes along I-95 throughout Miami-Dade, Broward, and Palm Beach Counties.

In 2009, the FDOT began the I-95 Corridor Planning Study, between Stirling Road (SR 848) in Broward County and Indiantown Road (SR 706) in Palm Beach County, to evaluate the feasibility of adding tolled express lanes in the median of I-95. The study was completed in January 2012 and determined that express lanes along this portion of I-95 was feasible and could be studied further during the PD&E phase to evaluate the concept as a viable alternative along the corridor.

FDOT was also tasked by the state legislature to conduct the I-95 Transportation Alternatives Study from Miami to Jacksonville. Completed in 2010, this report was required to "...include [the] identification of cost-effective measures that may be implemented to alleviate congestion on Interstate 95, facilitate emergency and security responses and foster economic development."

The results of these studies identified, recommended and prioritized the development of an integrated multimodal transportation system which is economically efficient, safe and environmentally sound.

As a result, the Florida Department of Transportation (FDOT) is undertaking several Project Development and Environment studies to investigate alternatives for improving capacity along I-95 and identify and document the environmental impacts of these alternatives. In January 2012, FDOT initiated this PD&E study for an 8.649 mile segment of I-95, from Stirling Road (SR 848) to Oakland Park Boulevard (SR 816) in Broward County. This project was screened using FDOT's Environmental Screening Tool (EST) and an Efficient Transportation Decision Making (ETDM) Programming Screening Report was published on June 27, 2011 (ETDM # 13168) along with the Advanced Notification Package (AN).

The design and construction of the proposed improvements from Stirling Road to Oakland Park Boulevard are currently federally funding. Design is funded in the 1st five years of the Work Program (FY 2015) and construction is funded in the 2nd five years of the SIS Plan (FY 2019 and 2021)*. Construction funding and delivery methods will be evaluated by the Department to determine the final construction funding plan for this segment and the entire next phase of I-95 Express from Stirling Road (SR 848) to Linton Boulevard (CR 782).

Work Program Public Hearings will be held in November of this year. During these annual hearings, the public will be informed of the federal funding associated with this project.

* Note: The 2nd five year SIS plan is comprised of SIS projects that are scheduled to be funded in the five years (FY 2019 through 2023) following the tentative 1st five year Work Program (FY 2014 through 2018).

1.2 Project Description

This segment of I-95 is functionally classified as a Divided Urban Principal Arterial Interstate and is part of the state's Strategic Intermodal System (SIS). I-95 is one of only two major expressways (Florida's Turnpike being the other) that connect the major employment centers and residential areas within the South Florida tri-county area: Miami-Dade, Broward and Palm Beach Counties. I-95 is a critical corridor for moving freight, transit and passenger vehicles into, through and out of the corridor each day.

The majority of the project corridor has eight travel lanes, four in each direction, plus auxiliary lanes within closely spaced interchanges. The remainder of the corridor features a few segments that carry six and ten general purpose travel lanes. The northbound and southbound travel lanes are separated by either a concrete barrier wall or a grassy median. Roadway swales run on both sides of the facility. There are eight interchanges along the project corridor:

- Stirling Road (SR 848) & I-95
- Griffin Road (SR 818) & I-95
- I-595 & I-95
- SR 84 & I-95
- Davie Boulevard (SR 736) & I-95
- Broward Boulevard (SR 842) & I-95
- Sunrise Boulevard (SR 838) & I-95
- Oakland Park Boulevard (SR 816) & I-95

The project segment traverses a dense urban area with predominantly commercial and residential uses. Within the project limits, I-95 traverses five cities (Hollywood, Dania Beach, Fort Lauderdale, Wilton Manors and Oakland Park) and unincorporated Broward County. Both the Fort Lauderdale-Hollywood International Airport and Port Everglades are also located near the I-95 and I-595 interchange. Improvements to the I-95 corridor are needed in order to:

- Provide new and enhanced mobility options for motorists and transit users
- Enhance mobility of goods and services to support the freight network
- Improve emergency evacuation
- Support economic development

The study seeks to maximize long-term capacity needs, long-term mobility needs, travel reliability and travel options for drivers. The opportunity to incorporate regional express bus service will also be investigated. (See **Figure 1 – Project Location Map**).

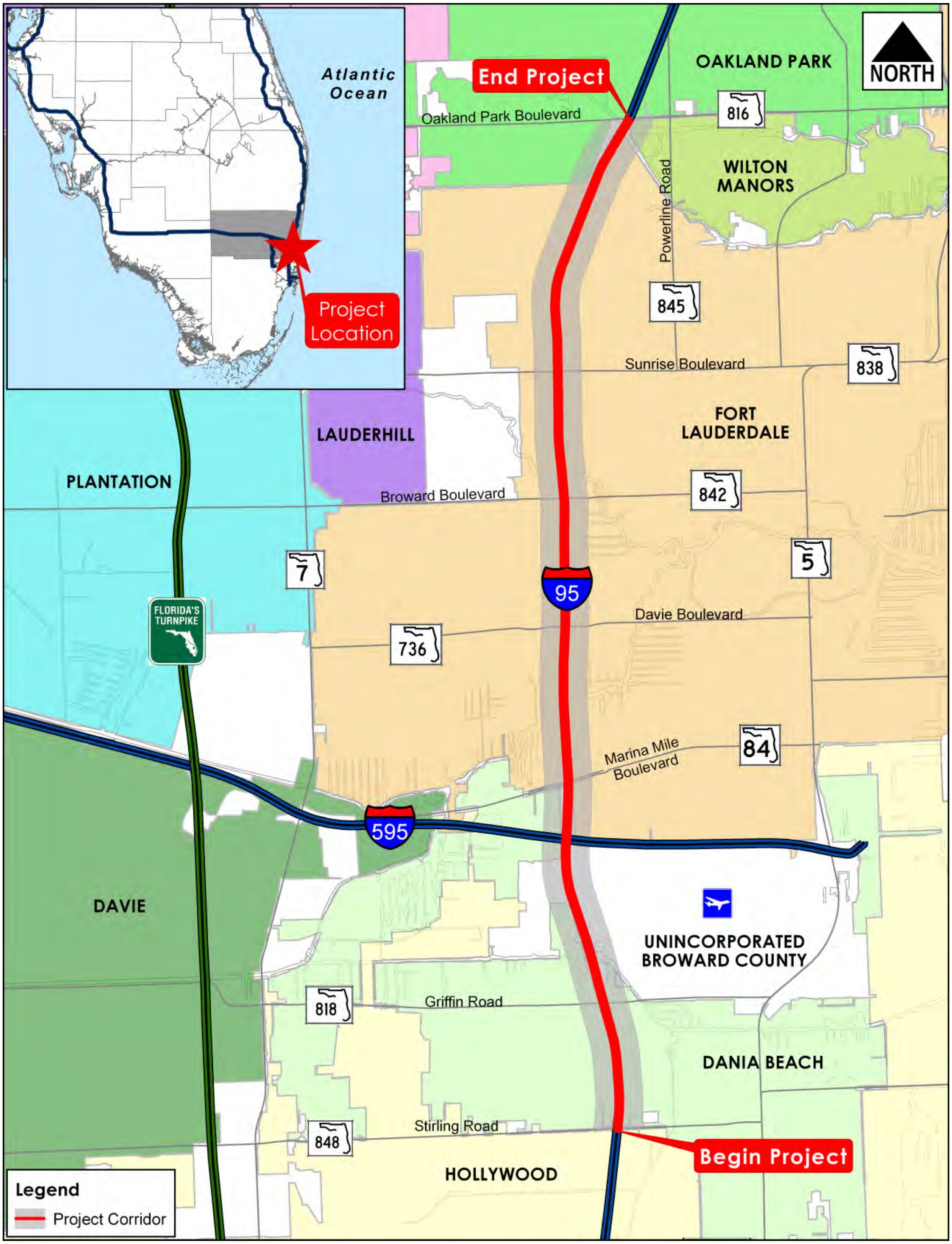


Figure 1-1
Project Location Map

1.3 Purpose and Need

The primary purpose of this project is to maximize long-term capacity needs, long-term mobility needs, travel reliability and travel options for drivers. The opportunity to incorporate regional express bus service will also be investigated. The need for the project is based on the following criteria:

Capacity/Transportation Demand: The I-95 project corridor operates at level of service (LOS) F; in addition, the High Occupancy Vehicle (HOV) lanes along much of this corridor are also operating near capacity at present. Without improvements, the project corridor will continue to experience high delays and operate at LOS F in 2035; driving conditions for residents and commuters will continue to deteriorate well below acceptable LOS standards. Travel demand forecasting efforts completed in previous studies have shown that the addition of general purpose lanes, within the study limits, would not improve the existing and future operations of the corridor. As a result, the study will evaluate strategies that maximize long-term capacity needs, long-term mobility needs, travel reliability and travel options (improve transit and other forms of ride sharing).

Growth Management Planning: This segment of I-95 is one of the most heavily traveled sections of urban interstate in the nation. As traffic levels increase due to population and employment growth, both along the corridor and in the region, it will become increasingly important to continue facilitating north-south traffic movement throughout Broward County and Southeast Florida. The regional roadway system is close to build-out and the ability to add more traffic lanes is limited; in addition, Broward County is only able to grow inward since it is geographically constrained.

System Linkage: This project is intended to maximize long-term mobility options for motorists and transit users. Strategies evaluated will complement and support efforts to improve thru-put, travel speeds and travel time reliability in the region.

Modal Interrelationships: Freight Activity: The proposed improvements along the I-95 project corridor are critical in order to enhance the mobility of goods by alleviating current and future congestion along the corridor and on the surrounding freight network. Reduced congestion will serve to maintain and improve viable access to the major transportation facilities and businesses of the area (including connectors to freight activity centers/local distribution facilities or between the regional freight corridors).

Emergency Evacuation: As part of the emergency evacuation route network designated by the Florida Division of Emergency Management, I-95 is critical in facilitating the movement of traffic during emergency evacuation periods. This facility connects other major arterials and highways designated on the state evacuation route network within the project limits, such as I-595 and Florida's Turnpike. The project will allow for enhanced emergency access and incident response times.

1.3.1 Capacity / Transportation Demand

The Broward Metropolitan Planning Organization (MPO) 2035 Long Range Transportation Plan (LRTP) currently identifies I-95 from Stirling Road (SR 848) to north of Oakland Park Boulevard

(SR 816) as a deficient roadway with a volume-to-capacity (v/c) ratio = 1.56. This indicates that the roadway segment has exceeded its designated service volume and LOS standard. In other words, the traffic volume exceeds capacity in the number of lanes available to accommodate the traffic demand.

According to data extracted from the 2009 Florida Department of Transportation (FDOT) Florida Traffic Information database and the 2035 Existing + Committed Network of the South East Regional Planning Model (SERPM), the existing and future traffic conditions for the I-95 project corridor are as follows:

The 2009 Annual Average Daily Traffic (AADT) volume is projected to grow from 286,500 vehicle trips per day to 310,350 vehicle trips per day in 2035 (0.3% annual growth rate).

The 2009 Annual Average Daily Truck Traffic (AADTT) volume is projected to increase from 24,410 truck trips per day (8.52%) to 26,442 truck trips per day in 2035 (assuming the percentage of trucks on the road remains the same as the base year percentage).

Based on the 2009 FDOT Generalized Annual Average Daily Volumes Table 1 of the FDOT Quality/Level of Service Handbook, the I-95 project corridor operates at LOS F. It is important to note that the HOV lanes along much of this corridor are also operating near capacity at present, offering little time savings to carpools/vanpools on I-95. As a result of the corridor being over capacity, travel demand is shifting vehicles onto less appropriate facilities. This, in turn, is negatively impacting the quality of life in local neighborhoods, as well as increasing driver frustration, reducing safety and increasing trip travel time. Without improvements, the project corridor will continue to experience high delays and operate at LOS F in 2035; driving conditions for residents and commuters will also deteriorate well below acceptable LOS standards.

The proposed project is expected to provide Southeast Florida motorists and transit users with a viable option for consistent and dependable travel. The project will offer potential time savings during peak travel periods.

1.3.2 Plan Consistency

The Broward Metropolitan Planning Organization (MPO) Fiscal Year 2010/2011 to Fiscal Year 2014/2015 Transportation Improvement Program (TIP) identifies Phase II of the I-95 Express Lanes (Managed Lanes) project (95 Express/HOT Lanes with Bus Rapid Transit) from Miami-Dade/Broward County Line to Broward Boulevard. It also identifies general HOV operations along I-95 throughout Broward County. The project is, however, identified as 'cost feasible' in the Broward MPO 2035 Long Range Transportation Plan (LRTP) as part of a larger project to implement four Express Lanes (managed lanes) on I-95 from I-595 to the Broward/Palm Beach County Line, as well as in the 2035 Southeast Florida Regional Transportation Plan. Furthermore, the Fiscal Year 2016/2017 to Fiscal Year 2020/2021 Strategic Intermodal System (SIS) Funding Strategy Second Five-Year Plan identifies $104,949,000 in 2019 for construction of two additional special use lanes on I-95 from Stirling Road (SR 848) to north of Oakland Park Boulevard (SR 816). In addition, $2,036,000 is programmed for the Project Development and Environment (PD&E) Study under Fiscal Years 2010/2011 and 2011/2012 of the Fiscal Year 2010/2011 to Fiscal Year 2014/2015 FDOT Work Program. Design is programmed at $3,450,000 in Fiscal Year 2015/2016. Although the project is not reflected on 'Map 3.2: Future Traffic Circulation and Significant Parking Facilities' of the adopted Broward County Comprehensive Plan, improvements to the HOV system on I-95 are supported by Transportation Element Policy 3.4.18. FDOT District 4 will coordinate with Broward County and the Broward MPO to ensure that the project is included in the adopted Comprehensive Plan and that funding is identified for future project phases in the TIP, LRTP, State Transportation Improvement Program (STIP) and FDOT SIS Cost Feasible Plan.

1.3.3 Growth Management Planning

I-95 is recognized as a vital economic development corridor of Broward County. Serving as one of two major expressways that connect the major employment centers and residential areas of Miami-Dade, Broward and Palm Beach Counties (Florida's Turnpike being the other), the I-95 project segment fills an important role in facilitating the north-south movement of traffic in Southeast Florida. The project segment traverses a dense urban area with predominantly commercial and residential uses lining the corridor, and presently supports three designated Community Redevelopment Areas (located at the northern end of the segment within the vicinity of Sunrise Boulevard (SR 838) and Oakland Park Boulevard (SR 816)). These areas are defined as having the ability to accommodate residential infill and development interest due to their access to regional transportation corridors, support infrastructure and services. In addition, the project corridor supports and promotes the economic development and expansion activities of two major regional employers, Fort Lauderdale-Hollywood International Airport and Port Everglades (located east of the project corridor near the I-95 and I-595 interchange). Based on socioeconomic data extracted from the traffic analysis zones of the 2035 South East Regional Planning Model (SERPM), which encompass the I-95 project corridor:

- Population is projected to grow along the corridor from 21,339 in 2005 to 26,636 in 2035 (0.8% annual growth rate).
- Employment along the corridor is projected to grow from 22,879 in 2005 to 33,008 in 2035 (1.5% annual growth rate).

Similarly, according to projections prepared for the Broward MPO 2035 LRTP:

- Population within the county is forecasted to increase from 1,747,399 in 2005 to 2,250,830 in 2035 (1.0% annual growth rate).
- Employment within the county is projected to grow from 735,731 in 2005 to 1,011,286 in 2035 (1.3% annual growth rates).

This segment of I-95 is one of the most heavily traveled sections of urban interstate in the nation with an estimated 286,500 vehicle trips per day. The traffic volume is expected to exceed 310,000 vehicle trips per day by 2035. As traffic levels increase due to population and employment growth, both along the corridor and in the region, it will become increasingly important to facilitate reliable north-south traffic movement throughout Broward County and Southeast Florida. Broward County is only able to grow inward due to geographical constraints of the Atlantic Ocean to the east, the Everglades to the west, urbanized Palm Beach County to the north and urbanized Miami-Dade County to the south. The regional roadway system is also close to build-out and the ability to add more traffic lanes is limited. The project is anticipated to meet the mobility needs of the area by alleviating current and future congestion on the corridor and surrounding roadway network. The proposed project will allow I-95 to continue to serve as an important arterial in facilitating the north-south movement of traffic in Southeast Florida, thus improving access between communities of Miami-Dade, Broward, and Palm Beach Counties.

1.3.4 System Linkage

The proposed project is intended to offer new and enhanced mobility options for motorists and transit users. Strategies evaluated will seek to complement and support efforts to improve thru-put, travel speeds and travel time reliability in the region. The following regional improvements are presently underway:

SR 9 (I-95) from Golden Glades Interchange to I-595 (SR 862) / (ETDM Project #3174)
Miami-Dade County, Broward County

Referred to as "95 Express - Phase 2", this project will extend the existing dual Express Lanes (HOT lanes) that were previously constructed in each direction along I-95 as part of the "95 Express - Phase 1" project . Approximately 11 miles in length, the "95 Express - Phase 2" project will implement two Express Lanes (HOT) lanes in each direction through widening, as well as the conversion of the existing single HOV lane in each direction. The Express Lanes (managed lanes) will have variable toll pricing based on congestion. Project construction (under a design-build contract) broke ground in early 2011 and is anticipated to be completed by early 2014.

SR 9 (I-95) from North of Oakland Park Boulevard (SR 816) to South of Glades Road (SR 808) / (ETDM Project #3330)
Broward County, Palm Beach County

This project (approximately 8 miles in length) is currently in the Project Development and Environment (PD&E) phase. As part of the PD&E process, alternatives are presently being analyzed to maximize long-term capacity needs, long-term mobility needs, travel reliability and travel options. The PD&E process is anticipated to be completed by 2013.

1.3.5 Modal Interrelationships

Freight Activity

I-95 is the primary interstate route along the east coast of the United States extending from Maine to Florida and serving some of the most populated urban areas in the country. In Florida, I-95 is a designated Strategic Intermodal System (SIS). The SIS is a statewide network of highway, railway and waterway corridors as well as transportation hubs that handle the bulk of Florida's passenger and freight traffic. Highways that are designated as part of the SIS provide for movement of high volumes of goods and people at high speeds. The SIS highway network is composed of interconnected limited- and controlled-access roadways (which include designated SIS highway corridors) that provide for high-speed and high-volume traffic movements within the state to serve both interstate and regional commerce and long-distance trips. This statewide transportation network accommodates high occupancy vehicles, express bus transit and, in some corridors, passenger rail service.

Within southeast Florida, I-95 is a vital north-south transportation corridor providing important regional access to major east/west and north/south transportation corridors, as well as residential and employment activity centers and other regional destinations in the area. Within the project limits, I-95 connects to the local roadway network and a number of additional SIS facilities such as I-595, Florida's Turnpike, Fort Lauderdale-Hollywood International Airport and Port Everglades. Several SIS facilities also run parallel to the I-95 corridor including the FEC Railway, FEC Intermodal Terminal and South Florida Regional Transportation Authority Tri-Rail.

According to the Broward County Urban Freight/Intermodal Mobility Study (completed in 2008), the I-95 project corridor supports three freight industry zones:

- I-95/Powerline Road Corridor
- I-595/Airport Zone (Mega Transport Zone)
- South County/Other

It should be noted that the current daily truck volume on the corridor, which is as high as 8.52%, is expected to increase as freight activity within these zones expands.

The proposed improvements along the I-95 project corridor are critical to enhance the mobility of goods by alleviating current and future congestion along the corridor and on the surrounding freight network. Reduced congestion will serve to maintain and improve viable access to the major transportation facilities and businesses of the area (including connectors to freight activity centers/local distribution facilities or between the regional freight corridors).

Transit and Non-Motorized Travel:

Direct route services that do not require transfers will be explored for cross county trips to initially provide uncongested routes for buses on I-95 and subsequently on a regional network. Broward County Transit currently operates a number of local routes within the limits of the project; however, none use the I-95 corridor. Routes 16 and 72 operate along Stirling Road (SR 848) and Oakland Park Boulevard (SR 816). 95 Express premium bus service offers direct express service to Miami, Miami's Civic Center/Health District and Doral from convenient locations in Broward County and the Golden Glades Interchange. There are six express routes available. Buses along 95 Express are not tolled.

Based on the "FDOT Managed Lanes Comprehensive Traffic and Revenue Study" completed in 2007, the express bus service in Miami-Dade County contributed to an estimated 18% of the total person HOV lane throughput during peak-period conditions. By providing improved access to the section of the I-95 corridor from the Broward Boulevard Park and Ride lot (a major super-regional transit hub which provides access to Tri-Rail, Amtrak, proposed east/west light rail, greyhound, local bus and shuttle services), inter-county regional express bus service (or Bus Rapid Transit, BRT) service can be extended to the portion of the corridor in Broward County. As such, the proposed improvements provide an opportunity for express bus service to qualify as BRT, offering faster and more reliable service for many transit users.

1.3.6 Emergency Evacuation

I-95 serves as part of the emergency evacuation route network designated by the Florida Division of Emergency Management. Also designated as a Broward County evacuation facility, I-95 is critical in facilitating traffic during emergency evacuation periods as it connects other major arterials and highways of the state evacuation route network (i.e., I-595 and Florida's Turnpike). The project is anticipated to:

- Improve emergency evacuation capabilities by enhancing connectivity and accessibility to other major arterials designated on the state evacuation route network
- Increase the capacity of traffic that can be evacuated during an emergency event

Allow for enhanced emergency access and incident response times.

1.4 Commitments and Recommendations

The following commitments and recommendations have been made by the Florida Department of Transportation (FDOT) and will be adhered to during the final design and/or construction phases.

1. The FDOT will implement the most current versions of the following protection measures which will be included in the construction documents and implemented during construction: 1) Florida Fish and Wildlife Conservation Commission (FWC) *Standard Manatee Conditions for In-Water Work; 2)* US Fish and Wildlife Service (USFWS) *Standard Protection Measures for the Eastern Indigo Snake;* and 3) National Marine Fisheries Service (NMFS) *Sea Turtle and Smalltooth Sawfish Construction Conditions*.

2. The FDOT will coordinate with the USFWS during final design (through the environmental permitting process) to determine if wood stork nesting colonies are active in the project area. If mitigation for loss of wood stork foraging habitat is required, it will occur through purchase of mitigation credits from an appropriate USFWS-approved mitigation bank. In the event new drainage features do not offset wood stork Core Foraging Area (CFA), mitigation credits will be purchased.

3. The FDOT will provide to NMFS for review and approval (during final design through the environmental permitting process) a detailed mitigation plan that fully offsets the unavoidable adverse impacts to mangroves and tidal freshwater Submerged Aquatic Vegetation (SAV), i.e., Essential Fish Habitat (EFH).

4. During final design, if right of way (R/W) is acquired for offsite ponds or other drainage features, the FDOT will perform protected species and wetlands reviews of those locations.

5. The FDOT will coordinate with the SFWMD, USACE, and NMFS during final design (through the environmental permitting process) to further avoid and minimize, where practical, impacts to stormwater swales and surface waters, including mangroves.

6. The FDOT will evaluate the feasibility of providing all 12-ft wide general purpose lanes in the constrained typical sections during the final design phase.

7. The FDOT is committed to the construction of feasible noise abatement measures at the locations where noise barriers have been recommended for further consideration (Franklin Park neighborhood south of Sistrunk Boulevard - along the shoulder of the southbound lanes or along the west side of the adjacent railroad corridor) during the final design phase, contingent upon the following conditions:

    - *Detailed noise analyses during the final design process support the need for abatement;*
    - *Reasonable cost analyses indicate that the economic cost of the barrier(s) will not exceed the cost reasonable criterion;*
    - *Safety and engineering aspects as related to the roadway user and the adjacent property owner have been reviewed and any conflicts or issues resolved;*
    - *Community input regarding desires, types, heights and locations of barriers has been solicited by the FDOT; and*
    - *Any other mitigating circumstances found in Section 17-4.6.1 of FDOT's PD&E Manual have been analyzed.*

8. A reassessment of the project corridor for additional sites particularly sensitive to construction noise and/or vibration will be performed during design to ensure that impacts to such sites are minimized. Coordination between the FDOT and the operators of any construction noise/vibration sensitive locations identified during design will occur, and if applicable, Technical Special Provisions (TSP) developed for the project's contract package in order to ensure that impacts to such businesses are minimized.

9. The FDOT will reevaluate the feasibility and reasonableness of noise abatement measures during Final Design if warranted by changes to the project's design.

10. Construction noise and vibration impacts will be minimized by adherence to the controls listed in the latest edition of the FDOT's *Standard Specifications for Road and Bridge Construction*.

11. Construction activities for the proposed action may potentially have short-term air quality impacts within the immediate vicinity of the project. Construction activities may generate temporary increases in air pollutant emissions in the form of dust from earthwork and unpaved roads and smoke from open burning. Such emissions and potential impacts will be minimized by adherence to all applicable State and local regulations and to the latest edition of the FDOT *Standard Specifications for Road and Bridge Construction.*

12. Water quality impacts resulting from erosion, sedimentation, and turbidity reduction will also be controlled through measures outlined in the latest edition of the FDOT *Standard Specifications for Road and Bridge Construction.* The removal of structures and debris will be in accordance with local and State regulation agencies permitting this operation. The Contractor is responsible for methods of controlling pollution on haul roads, in borrow pits, other material pits, and areas used for disposal of waste materials from the project. Temporary erosion control features as specified in Section 104 of the FDOT *Standard Specifications for Road and Bridge Construction* may consist of temporary grassing, sodding,

mulching, sandbagging, slope drains, sediment basins, sediment checks, artificial coverings, and berms.

13. The sequence of construction will be planned in such a way as to minimize traffic delays. The project will involve the development and use of a Maintenance of Traffic (MOT) Plan. This Plan will include traffic management and signage, access to local businesses and residences, detour routes, public notification of alternate routes, emergency services coordination and project scheduling. The local news media will be notified in advance of road closings and other construction-related activities which could excessively inconvenience the community so that business owners, residents, and/or tourists in the area can plan travel routes in advance. A sign providing the name, address, and telephone of an FDOT contact person will be displayed on-site to assist the public in obtaining answers to questions or complaints about project construction.

14. The FDOT will coordinate with the City of Oakland Park regarding any potential impacts to the interchanges or potential pond sites within their city as this project progresses through the design and construction phases.

15. The FDOT will coordinate with the Broward County Aviation Department through the design and construction phases, to avoid any conflicts with the existing and new glide path, and ensure that the express and general purpose lanes are adequately signed and provide clear and concise messages to the airport patrons from both the north and south directions.

16. Utility Agency Owners (UAO) with facilities within the vicinity of the North Woodlawn Cemetery will refrain from relocating any facilities within the limits of the cemetery. The FDOT will also avoid the construction of any new underground utilities within the state R/W adjacent to the cemetery property.

17. The FDOT will incorporate design variances and exceptions for the 300-foot area in front of the North Woodlawn Cemetery, such that there will be no new engineering features located in front of the cemetery.

18. The contractor will be restricted from staging along the shoulder adjacent to the North Woodlawn Cemetery.

19. Before construction begins, an unanticipated finds plan will be developed. The plan will include specific procedures to be taken in the event that unanticipated finds, including human remains, are encountered during construction.

20. During construction, an archaeological monitor will be present during all subsurface excavations conducted within 250 feet of North Woodlawn Cemetery. Monitoring will be conducted in accordance with the unanticipated finds plan.

21. During final design, consideration will be given to the preservation or relocation of existing landscaping and/or and inclusion of new landscaping along the corridor. This includes landscaping beautification that exists at several interchanges along I-95 (Broward, Sunrise and Oakland Park Boulevards) as part of the "Greening Gateways" program. This will be done in collaboration with the Broward Metropolitan Planning Organization (MPO) and local

jurisdiction. Coordination with the Greening Gateways Committee will be maintained during the design and construction phases as well.

22. The FDOT will perform detailed safety evaluations at the identified high crash locations after the PD&E Study or during design to quantitatively determine the impact of the proposed improvements and evaluate and address safety improvements if required. The detailed analysis will include preparation of collision diagrams, additional field reviews, expected value analysis and review of police reports (if necessary) to identify the crash patterns and potential countermeasures at each of the identified locations.

23. The FDOT will prepare an Incident Management Plan for the deployment of the next phase of express lanes. This plan will build upon and be coordinated with the existing Incident Management Plan in place for Phases I and II and with our agency partners. The plan will be submitted to FHWA for review and approval.

24. The FDOT is in the process of completing a study for the development of a Regional Concept of Transportation Operations. FDOT will continue to work with our agency partners to prepare a Concept of Operations plan. This plan will be submitted to FHWA for review and approval.

1.5 Description of Recommended Action

The Recommended Alternative will convert the existing High Occupancy Vehicle (HOV) lanes to tolled Express Lanes and add one additional tolled Express Lane to the median of I-95, in each direction. This also provides for the opportunity to incorporate regional express bus service. The Express Lanes will have variable toll pricing based on congestion to optimize traffic flow.

The project corridor consists of three typical sections: one standard typical section with 12 ft. lanes and shoulders and a 4 ft. buffer between the Express Lanes and the general purpose lanes and two typical sections with 11 and 12 ft. lanes, 10 to 12 ft. shoulders, and a 2 ft. buffer between the Express Lanes and the general purpose lanes.

The standard typical section will be provided from Stirling Road (SR 848, M.P. 5.135) to I-595 (M.P. 7.555) and from north of the Broward Boulevard Park and Ride Ramp (M.P. 10.585) to Oakland Park Boulevard (SR 816, M.P. 13.742). The first reduced typical section is provided from I-595 (M.P. 7.555) to South of the Broward Boulevard Park and Ride Ramp (M.P. 9.738). The second reduced typical section is provided from South of the Broward Boulevard Park and Ride Ramp (M.P. 9.738) to North of the Broward Boulevard Park and Ride Ramp (M.P. 10.585). The difference between the two reduced configurations is that the second typical section includes a grass median.

The Recommended Alternative maintains the same number of general purpose and auxiliary lanes. The Express Lanes are separated from the general purpose lanes with tubular markers. As a result of these roadway improvements 13 bridges along I-95 will be widened. In addition, the bridges over NW 19th Street are recommended for replacement due to a vertical clearance and load rating deficiency. Further analysis is recommended during the design phase.

Stormwater treatment of the project runoff will be provided as required by the SFWMD Environmental Resource Permit (ERP). The Stormwater management systems proposed by this study meet existing water quality standards set forth in Chapter 62-302 of the Florida Administrative Code. Water quality will be provided for the increase in impervious area. The post-development discharge volume will be attenuated so that it is not greater than the predevelopment discharge. The project area outfalls to water bodies identified by the Florida Department of Environmental Protection (FDEP) as impaired waters. Nutrient loading calculations were performed based on the modified Harper methodology where the predevelopment condition is the existing condition. Calculations for the stormwater management system are contained in the **Stormwater Management Report** on file at FDOT District 4. The proposed stormwater management system will not require acquisition of right of way.

In accordance with traffic noise study requirements set forth by both the FHWA and FDOT, noise barriers were considered for all noise sensitive receptor sites where design year traffic noise levels were predicted to equal or exceed the NAC. One noise barrier is proposed between North Fork of New River and Sistrunk Boulevard. Noise impact at this location will be mitigated by the proposed barrier.

For the Recommended Alternative, the estimated total amount of impacts to stormwater swales supporting hydrophytic vegetation is 2.04 acres and to other surface waters (OSWs) is 2.32 acres (the latter includes 0.11 acres of impacts to fringe mangroves adjacent to the canal bridges). These amounts were broken down as: direct impacts of 1.60 acres to stormwater swales with hydrophytic vegetation and 1.51 acres to OSWs; indirect effects of 0.57 acres and 0.81 acres, respectively. No cumulative effects are anticipated. Final acreages will be determined during the environmental permitting process.

A conceptual signing and pavement marking master plan has been prepared for the I-95 Express Lanes corridor from Stirling Road to Linton Boulevard (CR 782).

The department is currently evaluating the Intelligent Transportation Systems (ITS) infrastructure for the entire corridor. Locations for potential gantries and ITS infrastructure were identified and a detailed design will be finalized during the design phase.

2.0 EXISTING CONDITIONS

2.1 Functional Classification

I-95 between Stirling Road (SR 848) and Oakland Park Boulevard (SR 816) is functionally classified as a Divided Urban Principal Arterial Interstate and is part of the Strategic Intermodal System (SIS). The major roadways traversing the project corridor vary in functional classification between Urban Principal Arterial Interstate (I-595), Urban Other Principal Arterial, and Urban Minor Arterial. **Figure 2-1** presents the functional classification of the various roadways near the project corridor.

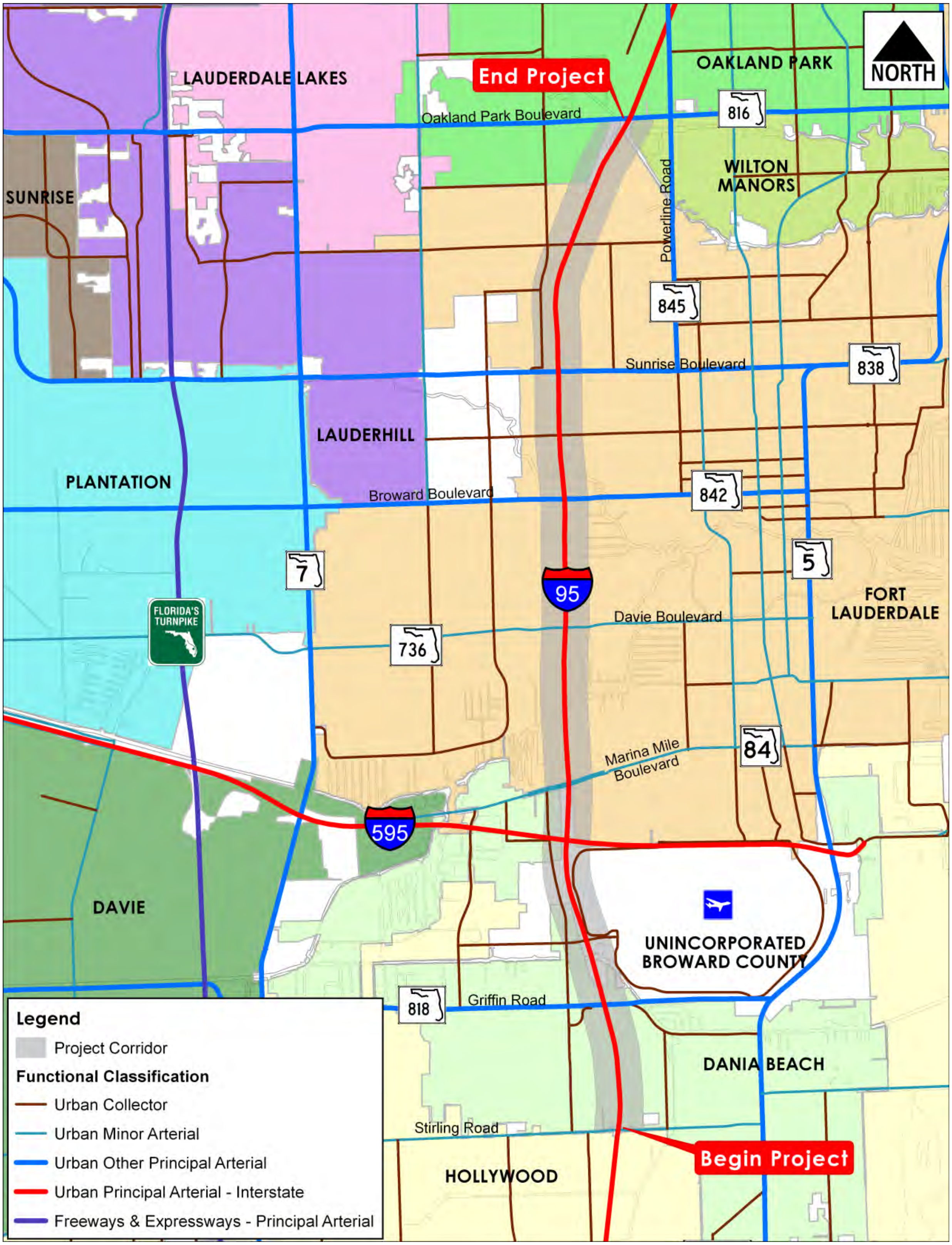


Figure 2-1
Functional Classification

2.2 Typical Sections

The project corridor consists of three to four 12 ft. wide general purpose lanes (GPL), one 12 ft. wide High Occupancy Vehicle (HOV) lane, 12 ft. outside shoulders, and inside shoulders varying from 10 ft. to 12 ft. The existing typical sections can be divided into three different configurations based on the number of general purpose lanes, width of the median, and available auxiliary lanes. Existing typical sections are depicted in **Figure 2-2**, **Figure 2-3**, and **Figure 2-4**.

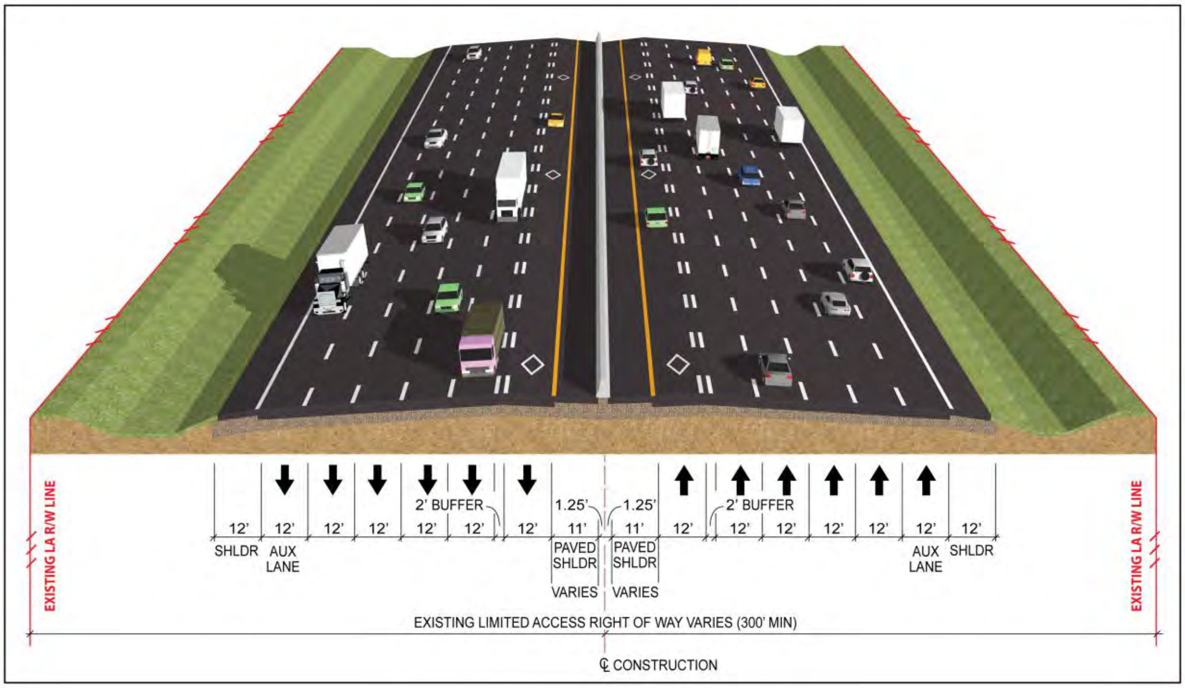


Figure 2-2 Existing Typical Section 1
from Stirling Road (SR 848, M.P. 5.135) to I-595 (M.P. 7.555.) and from North of the Broward Boulevard Park and Ride Ramp (M.P. 10.585) to Oakland Park Boulevard (SR 816, M.P. 13.742)

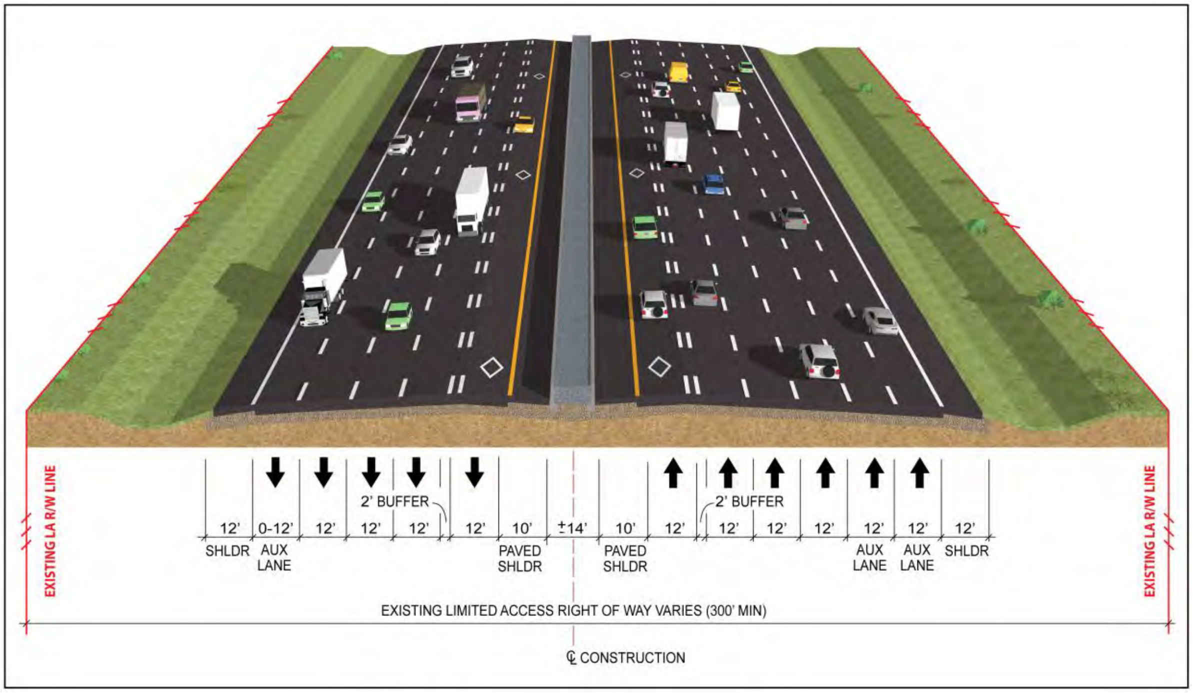


Figure 2-3 Existing Typical Section 2
from SR I-595 (M.P. 7.555) to South of the Broward Boulevard Park and Ride Ramp (M.P. 9.738)

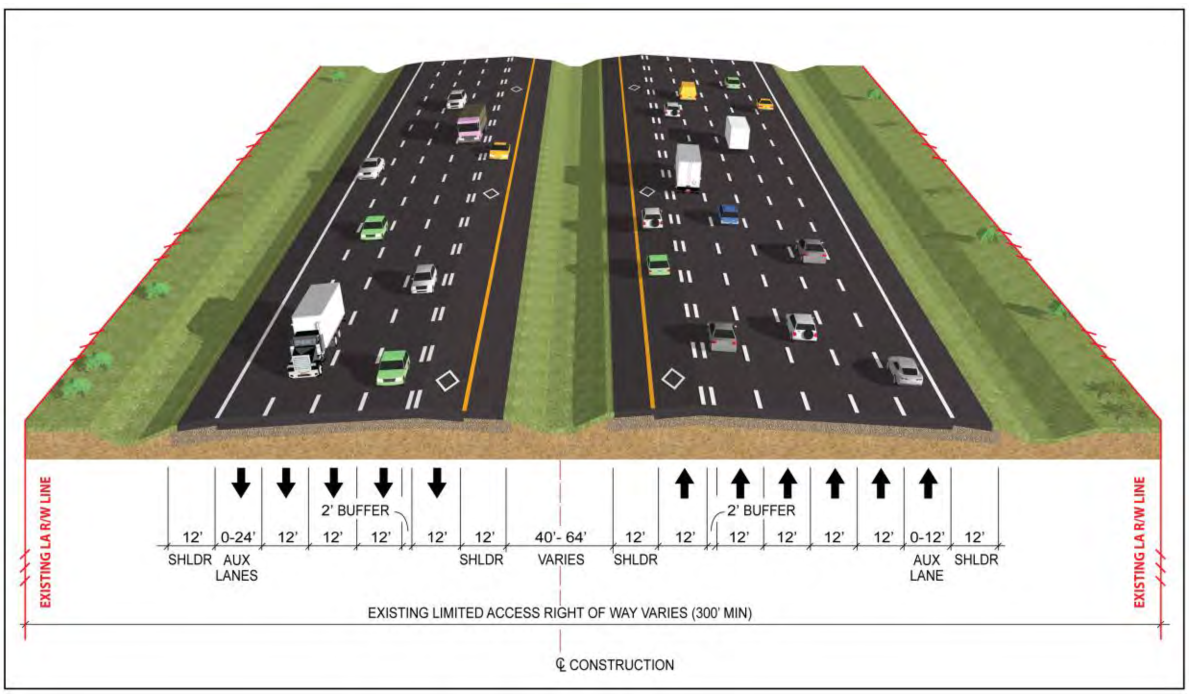


Figure 2-4 Existing Typical Section 3
from South of the Broward Boulevard Park and Ride Ramp (M.P. 9.738) to North of the Broward Boulevard Park and Ride Ramp (M.P. 10.585)

2.3 Pedestrian and Bicycle Facilities

I-95 is a limited access facility and bicycles and pedestrians are not allowed along the corridor. However, pedestrian and bicycle facilities are present along the overpasses and underpasses of the interchange cross streets. The following is a description of the bicycle and pedestrian facilities at each cross street:

- **Stirling Road (SR 848)** - sidewalks along both sides of the street and crosswalks at all intersections with ramps.
- **Griffin Road (SR 818)** - sidewalks along both sides of the street and crosswalks at all intersections with ramps.
- **SW 42 Street** - no pedestrian or bicycle facilities
- **SR 84** - no pedestrian facilities in this area along SR 84 however bicyclists are allowed to travel the roadway in this area.
- **Davie Boulevard (SR 736)** - sidewalks and crosswalks along the north side of this street. A concrete barrier separates pedestrians from the travel lanes.
- **Broward Boulevard (SR 842)** - sidewalks along both sides of the street and crosswalks at all intersections with ramps.
- **NW 6 Street** - sidewalks along both sides of the street.
- **Sunrise Boulevard (SR 838)** - sidewalks along both sides of the street and crosswalks at all intersections with ramps.
- **NW 19 Street** - sidewalks along both sides of the street.
- **Oakland Park Boulevard (SR 816)** - sidewalks along both sides of the street and crosswalks at all intersections with ramps.

2.4 Right of Way

The Right of Way along the project corridor varies from 267 ft. to 602 ft. **Table 2-1** below summarizes the limits of the existing R/W by segment along the project corridor:

Table 2-1
Existing R/W

Corridor Segment	R/W Width (ft.)
Stirling Road (SR 848) Interchange to I-595 Interchange	300 (minimum 265)
I-595 Interchange to SR 84 Interchange	550 minimum
SR 84 Interchange to Davie Boulevard (SR 736) Interchange	295 minimum
Davie Boulevard (SR 736) Interchange to Broward Boulevard (SR 842) Interchange	420 minimum
Broward Boulevard (SR 842) Interchange to Sunrise Boulevard (SR 838) Interchange	340 (minimum 290)
Sunrise Boulevard (SR 838) Interchange to NW 19 Street	340 (minimum 290)
NW 19 Street to Oakland Park Boulevard (SR 816) Interchange	325

2.5 Geometric Elements

The existing geometric elements for the corridor were obtained from various sources such as existing plans from the FDOT District 4, topographic survey, and from the I-95/I-595 Master Plan

Study (FPID 409345-1) conducted by Reynolds, Smith, and Hill. This segment of I-95 was constructed in the 1960s. Since then, the corridor has been widened and the alignment has been modified.

2.5.1 Cross Section

The cross slope of the project corridor varies between several segments. The segments from Stirling Road (SR 848) to I-595 and from north of the Park and Ride to Oakland Park Boulevard (SR 816) contain 0.02 cross slope to the inside for the HOV lane; 0.02 cross slope to the outside for the three innermost general purpose lanes; and 0.03 cross slope to the outside for the remaining general purpose lanes and auxiliary lane. The segment from I-595 to south of the Park and Ride contains 0.02 cross slopes to the outside for both the HOV lane and two innermost general purpose lanes and 0.03 cross slope to the outside for the outermost general purpose lane and two auxiliary lanes. The segment from south of the Park and Ride to north of the Park and Ride contains 0.02 cross slope to the inside for the HOV lane; 0.02 cross slope to the outside for the two innermost general purpose lanes; and 0.03 cross slope to the outside for the two outermost general purpose lanes and auxiliary lane. The cross slope for the outside shoulder of all the segments is 0.06 to the outside. The cross slope for the inside shoulders varies from 0.02 to 0.06. The swale areas generally have 1:6 front slopes (1 vertical to 6 horizontal length units) and 1:4 back slopes; however, swale conditions vary throughout the corridor.

2.5.2 Horizontal Alignment

A review of the existing horizontal geometry for the project corridor was performed as part of this study. **Figure 2-5** corresponds with the tables below to show the location of the horizontal curves within the project corridor.

The horizontal alignment consists of 23 horizontal curves with interspersed tangent segments. All tangent segments along the corridor are connected by horizontal curves, i.e. there are no deflections without a horizontal curve. **Table 2-2** through **Table 2-4** summarizes the existing horizontal geometric characteristics of these curves. As shown in the tables below, several design elements along the corridor do not meet the FDOT Plans Preparation Manual (PPM) 2012 standards but satisfy the American Association of State Highway and Transportation Officials (AASHTO) 2011 requirements (Design Variation) and several do not meet both the FDOT PPM 2012 and AASHTO 2011 standards (Design Exception) as identified below:

- **Radius of Curvature and Superelevation –**design exception at 4 locations
- **Horizontal Curve Length** –design variation at 12 locations

Table 2-2
Existing Horizontal Alignment - Radius of Curvature and Superelevation

Curve No.	Existing Curve Parameters					Superelevation Criteria		Variations & Exceptions
	Alignment	Design Speed (mph)	Radius (ft.)	Superelevation	Length (ft.)	PPM	AASHTO	
H1	NB & SB	65	5779.600	0.030	1,069.93	0.033	0.033	Exception
H2	NB & SB	65	5779.570	0.030	1,073.41	0.033	0.033	Exception
H3	NB & SB	65	28647.890	0.020	2,003.86	NC	NC	OK

Table 2-2 Existing Horizontal Alignment - Radius of Curvature and Superelevation								
Curve No.	Existing Curve Parameters					Superelevation Criteria		Variations & Exceptions
	Alignment	Design Speed (mph)	Radius (ft.)	Superelevation	Length (ft.)	PPM	AASHTO	
H4	NB & SB	65	5729.580	0.032	2,294.28	0.033	0.033	Exception
H5	NB & SB	65	28647.890	0.020	2,333.47	NC	NC	OK
H6	NB & SB	65	11459.160	0.020	835.82	0.020	0.020	OK
H7	NB & SB	65	11459.160	0.030	682.42	0.020	0.020	OK
H8	NB & SB	65	22918.310	0.020	1,882.44	NC	NC	OK
H9	NB	65	22918.310	0.020	2,619.89	NC	NC	OK
H10	NB	65	22918.310	0.020	1,195.56	NC	NC	OK
H11	NB	65	9152.478	0.030	763.35	0.023	0.023	OK
H12	NB	65	35000.000	0.020	1,868.40	NC	NC	OK
H13	NB	65	11402.130	0.020	891.46	RC	RC	OK
H14	SB	65	16370.223	0.020	700.97	NC	NC	OK
H15	SB	65	22889.062	0.020	469.58	NC	NC	OK
H16	SB	65	6875.493	0.031	474.50	0.028	0.028	OK
H17	SB	65	11459.156	0.030	1,491.83	0.020	0.020	OK
H18	SB	65	4063.890	0.037	556.21	0.046	0.045	Exception
H19	SB	65	7639.000	0.030	725.15	0.025	0.025	OK
H20	NB & SB	65	11459.160	0.020	737.54	0.020	0.020	OK
H21	NB & SB	65	4583.659	0.047	2,053.77	0.041	0.041	OK
H22	NB & SB	65	5729.580	0.037	947.11	0.033	0.033	OK
H23	NB & SB	65	5729.580	0.039	947.11	0.033	0.033	OK

Table 2-3 Existing Horizontal Alignment – Horizontal Curve Length						
Curve No.	Existing Curve Parameters			PPM/AASTHO Criteria		Variations & Exceptions
	Alignment	Design Speed (mph)	Length (ft.)	Desirable (ft.)	Minimum (ft.)	
H1	NB & SB	65	1,069.93	1950	975	OK
H2	NB & SB	65	1,073.41	1950	975	OK
H3	NB & SB	65	2,003.86	1950	975	OK
H4	NB & SB	65	2,294.28	1950	975	OK
H5	NB & SB	65	2,333.47	1950	975	OK
H6	NB & SB	65	835.82	1950	975	Variation
H7	NB & SB	65	682.42	1950	975	Variation
H8	NB & SB	65	1,882.44	1950	975	OK
H9	NB	65	2,619.89	1950	975	OK
10	NB	65	1,195.56	1950	975	OK
H11	NB	65	763.35	1950	975	Variation
H12	NB	65	1,868.40	1950	975	OK
H13	NB	65	891.46	1950	975	Variation
H14	SB	65	700.97	1950	975	Variation
H15	SB	65	469.58	1950	975	Variation
H16	SB	65	474.50	1950	975	Variation
H17	SB	65	1,491.83	1950	975	OK
H18	SB	65	556.21	1950	975	Variation
H19	SB	65	725.15	1950	975	Variation

Table 2-3 Existing Horizontal Alignment – Horizontal Curve Length						
Curve No.	Existing Curve Parameters			PPM/AASTHO Criteria		Variations & Exceptions
	Alignment	Design Speed (mph)	Length (ft.)	Desirable (ft.)	Minimum (ft.)	
H20	NB & SB	65	737.54	1950	975	Variation
H21	NB & SB	65	2,053.77	1950	975	OK
H22	NB & SB	65	947.11	1950	975	Variation
H23	NB & SB	65	947.11	1950	975	Variation

Table 2-4 Existing Horizontal Alignment – Horizontal Sight Distance								
Curve No.	Existing Curve Parameters					Criteria		Variations & Exceptions
	Base line	Design Speed (mph)	Radius (ft.)	Horizontal Sightline Offset (ft.)	Sight Distance (ft.)	PPM	AASHTO	
H1	NB & SB	65	5779.600	16.50	874	730.00	645.00	OK
H2	NB & SB	65	5779.570	16.50	874	730.00	645.00	OK
H3	NB & SB	65	28647.890	11.50	1623	730.00	645.00	OK
H4	NB & SB	65	5729.580	16.50	870	730.00	645.00	OK
H5	NB & SB	65	28647.890	16.50	1945	730.00	645.00	OK
H6	NB & SB	65	11459.160	11.50	1027	730.00	645.00	OK
H7	NB & SB	65	11459.160	11.50	1027	730.00	645.00	OK
H8	NB & SB	65	22918.310	11.50	1452	730.00	645.00	OK
H9	NB	65	22918.310	11.50	1452	730.00	645.00	OK
H10	NB	65	22918.310	11.50	1452	730.00	645.00	OK
H11	NB	65	9152.478	16.50	1099	730.00	645.00	OK
H12	NB	65	35000.000	11.50	1794	730.00	645.00	OK
H13	NB	65	11402.130	16.50	1227	730.00	645.00	OK
H14	SB	65	16370.223	16.50	1470	730.00	645.00	OK
H15	SB	65	22889.062	16.50	1738	730.00	645.00	OK
H16	SB	65	6875.493	16.50	953	730.00	645.00	OK
H17	SB	65	11459.156	11.50	1027	730.00	645.00	OK
H18	SB	65	4063.890	40.00	1141	730.00	645.00	OK
H19	SB	65	7639.000	42.00	1421	730.00	645.00	OK
H20	NB & SB	65	11459.160	16.50	1230	730.00	645.00	OK
H21	NB & SB	65	4583.659	16.50	778	730.00	645.00	OK
H22	NB & SB	65	5729.580	16.50	870	730.00	645.00	OK
H23	NB & SB	65	5729.580	16.50	870	730.00	645.00	OK

2.5.3 Vertical Alignment

The existing vertical alignment along the project corridor was reviewed using the existing plans provided by the FDOT. **Figure 2-5** corresponds with the tables below to show the location of the vertical curves within the project corridor.

Table 2-5 through **Table 2-7** summarizes the existing vertical geometric characteristics of the project corridor. As shown in the tables below, the vertical alignment consist of 39 vertical curves, of which 14 are crest and 25 are sag. Several design elements along the corridor do not meet the

FDOT PPM 2012 standards but satisfy the AASHTO 2011 requirements (Design Variation) and several do not meet both the FDOT PPM 2012 and AASHTO 2011 standards (Design Exception) as identified below:

- **Grades and K-Values –**design exception at 2 locations and design variation at 9 locations
- **Vertical Curve Length** – design exception at 2 locations and design variation at 18 locations
- **Vertical Stopping Sight Distance** –design variation at 8 locations

Table 2-5
Existing Vertical Alignment- Grades and K Values

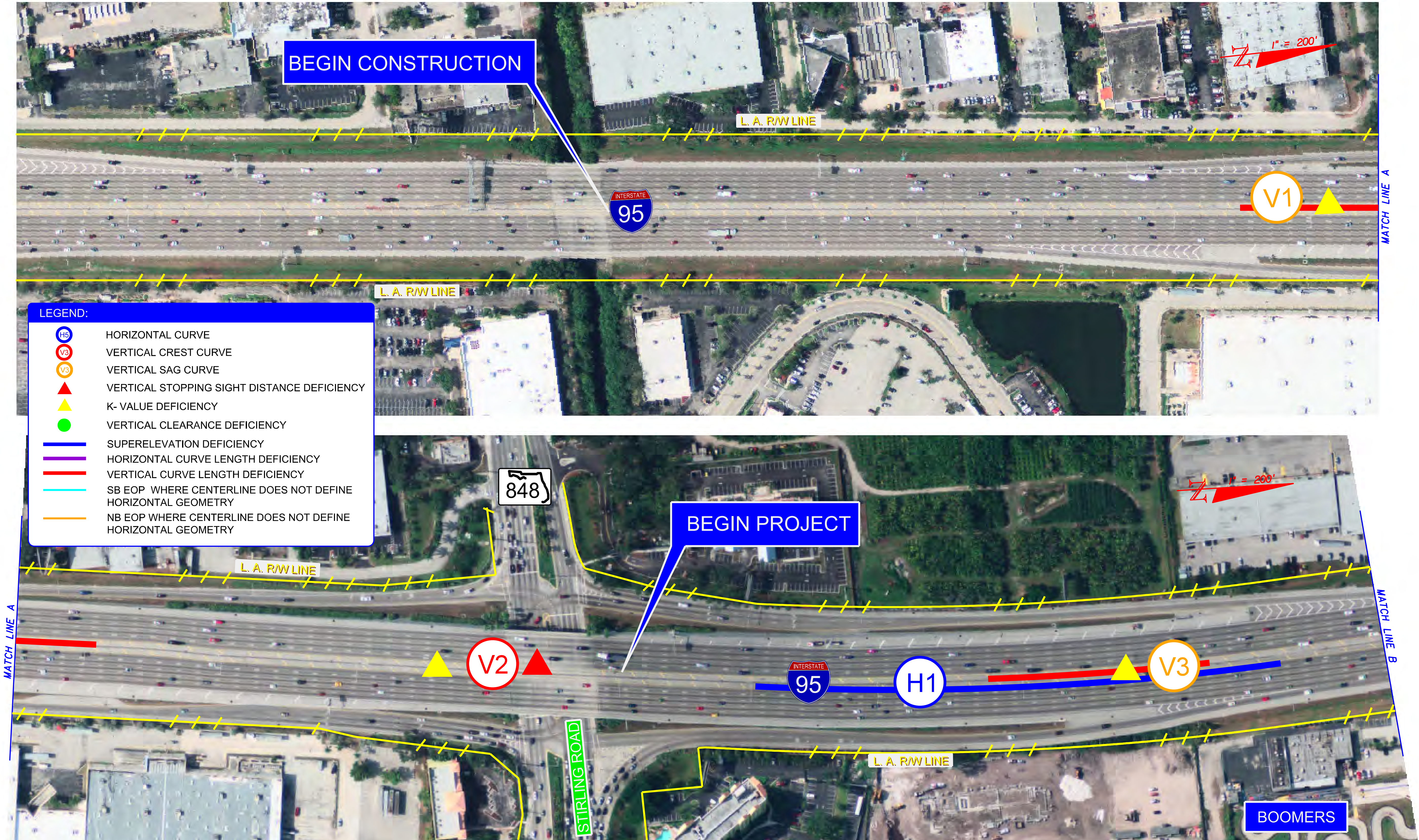
Curve No.	Baseline	Design Speed (mph)	Vertical Curve Type	Grade		Δ G	Existing Curve Length (ft.)	Existing K-Value	Criteria- K Value		Variation or Exception
				Back	Ahead				PPM	AASHTO	
V1	NB & SB	65	Sag	0.000	3.000	6.000	450.00	150.00	181.00	157.00	Exception
V2	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	401.00	193.00	Variation
V3	NB & SB	65	Sag	3.000	0	3.000	450.00	150.00	181.00	157.00	Exception
V4	SB	65	Sag	0.0000	2.5220	2.522	825.00	327.12	181.00	157.00	OK
V5	NB	65	Sag	0.0000	2.5220	2.522	800.00	317.21	181.00	157.00	OK
V6	NB & SB	65	Crest	2.522	2.434	4.956	1500.00	302.66	401.00	193.00	Variation
V7	NB & SB	65	Sag	2.434	0.000	2.434	440.00	180.77	181.00	157.00	Variation
V8	NB & SB	65	Sag	0.000	1.500	1.500	600.00	400.00	181.00	157.00	OK
V9	NB & SB	65	Crest	1.500	0.500	2.000	640.00	320.00	401.00	193.00	Variation
V10	NB & SB	65	Sag	0.500	0.302	0.802	500.00	623.44	181.00	157.00	OK
V11	NB	65	Sag	0.3020	0.300	0.602	440.00	730.90	181.00	157.00	OK
V12	SB	65	Sag	0.302	0.300	0.602	500.00	830.56	181.00	157.00	OK
V13	NB	65	Crest	0.300	0.300	0.600	500.00	833.33	401.00	193.00	OK
V14	SB	65	Crest	0.300	0.300	0.600	500.00	833.33	401.00	193.00	OK
V15	NB & SB	65	Sag	0.300	0.300	0.600	500.00	833.33	181.00	157.00	OK
V16	NB & SB	65	Crest	0.300	0.300	0.600	500.00	833.33	401.00	193.00	OK
V17	NB & SB	65	Sag	0.300	3.000	3.300	778.00	235.76	181.00	157.00	OK
V18	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	401.00	193.00	Variation
V19	NB & SB	65	Sag	3.000	0.750	2.250	1000.00	266.67	181.00	157.00	OK
V20	NB & SB	65	Sag	0.750	0.400	1.150	1000.00	869.57	181.00	157.00	OK
V21	NB & SB	65	Crest	0.400	0.9	1.300	1000.00	769.23	401.00	193.00	OK
V22	NB & SB	65	Sag	0.9000	0.4200	1.320	800.00	606.06	181.00	157.00	OK
V23	SB	65	Crest	0.4200	0.3700	0.790	1000.00	1265.82	401.00	193.00	OK
V24	NB	65	Crest	0.420	0.300	0.720	1000.00	1388.70	401.00	193.00	OK
V25	NB	65	Sag	0.300	0.414	0.714	800.00	1120.45	181.00	157.00	OK
V26	SB	65	Sag	2.117	0.000	2.117	800.00	377.84	181.00	157.00	OK
V27	NB	65	Sag	2.137	0.000	2.117	800.00	374.36	181.00	157.00	OK
V28	SB	65	Sag	0.000	0.109	0.109	800.00	7332.72	181.00	157.00	OK
V29	NB	65	Sag	0.000	0.1040	0.104	800.00	7692.31	181.00	157.00	OK
V30	SB	65	Sag	0.1091	2.468	2.359	600.00	232.81	181.00	157.00	OK
V31	NB	65	Sag	0.104	2.503	2.399	600.00	230.16	181.00	157.00	OK
V32	SB	65	Crest	2.47	2.48	4.95	1300.00	262.51	401.00	193.00	Variation
V33	NB	65	Crest	2.50	2.50	5.00	1300.00	260.09	401.00	193.00	Variation
V34	SB	65	Sag	2.484	0.000	2.484	800.00	322.06	181.00	157.00	OK
V35	NB	65	Sag	2.496	0.000	2.496	800.00	320.46	181.00	157.00	OK
V36	SB	65	Sag	0.000	2.478	2.478	600.00	242.16	181.00	157.00	OK
V37	NB	65	Sag	0.000	2.515	2.515	600.00	238.60	181.00	157.00	OK
V38	SB	65	Crest	2.478	2.007	4.485	1170.00	260.86	401.00	193.00	Variation
V39	NB	65	Crest	2.515	2.023	4.538	1170.00	257.82	401.00	193.00	Variation

Table 2-6
Existing Vertical Alignment- Vertical Curve Length

Curve No.	Baseline	Design Speed (mph)	Vertical Curve Type	Grade		Δ G	Existing Curve Length (ft.)	Existing K-Value	Criteria- Curve Length		Variation or Exception
				Back	Ahead				PPM	AASHTO	
V1	NB & SB	65	Sag	0.000	3.000	6.000	450.00	150.00	800.00	471.00	Exception
V2	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	1800.00	1158.00	OK
V3	NB & SB	65	Sag	3.000	0	3.000	450.00	150.00	800.00	471.00	Exception
V4	SB	65	Sag	0.0000	2.5220	2.522	825.00	327.12	800.00	395.95	OK
V5	NB	65	Sag	0.0000	2.5220	2.522	800.00	317.21	800.00	395.95	OK
V6	NB & SB	65	Crest	2.522	2.434	4.956	1500.00	302.66	1800.00	956.51	Variation
V7	NB & SB	65	Sag	2.434	0.000	2.434	440.00	180.77	800.00	382.14	Variation
V8	NB & SB	65	Sag	0.000	1.500	1.500	600.00	400.00	800.00	235.50	Variation
V9	NB & SB	65	Crest	1.500	0.500	2.000	640.00	320.00	1000.00	386.00	Variation
V10	NB & SB	65	Sag	0.500	0.302	0.802	500.00	623.44	800.00	125.91	Variation
V11	NB	65	Sag	0.3020	0.300	0.602	440.00	730.90	800.00	94.51	Variation
V12	SB	65	Sag	0.302	0.300	0.602	500.00	830.56	800.00	94.51	Variation
V13	NB	65	Crest	0.300	0.300	0.600	500.00	833.33	1000.00	115.80	Variation
V14	SB	65	Crest	0.300	0.300	0.600	500.00	833.33	1000.00	115.80	Variation
V15	NB & SB	65	Sag	0.300	0.300	0.600	500.00	833.33	800.00	94.20	Variation
V16	NB & SB	65	Crest	0.300	0.300	0.600	500.00	833.33	1000.00	115.80	Variation
V17	NB & SB	65	Sag	0.300	3.000	3.300	778.00	235.76	800.00	518.10	Variation
V18	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	1000.00	1158.00	OK
V19	NB & SB	65	Sag	3.000	0.750	2.250	1000.00	266.67	800.00	588.75	OK
V20	NB & SB	65	Sag	0.750	0.400	1.150	1000.00	869.57	800.00	180.55	OK
V21	NB & SB	65	Crest	0.400	0.9	1.300	1000.00	769.23	1000.00	250.90	OK
V22	NB & SB	65	Sag	0.9000	0.4200	1.320	800.00	606.06	800.00	207.24	OK
V23	SB	65	Crest	0.4200	0.3700	0.790	1000.00	1265.82	1000.00	152.47	OK
V24	NB	65	Crest	0.420	0.300	0.720	1000.00	1388.70	1000.00	138.98	OK
V25	NB	65	Sag	0.300	0.414	0.714	800.00	1120.45	800.00	112.10	OK
V26	SB	65	Sag	2.117	0.000	2.117	800.00	377.84	800.00	332.42	OK
V27	NB	65	Sag	2.137	0.000	2.117	800.00	374.36	800.00	335.51	OK
V28	SB	65	Sag	0.000	0.109	0.109	800.00	7332.72	800.00	17.13	OK
V29	NB	65	Sag	0.000	0.1040	0.104	800.00	7692.31	800.00	16.33	OK
V30	SB	65	Sag	0.1091	2.468	2.359	600.00	232.81	800.00	404.62	Variation
V31	NB	65	Sag	0.104	2.503	2.399	600.00	230.16	800.00	409.28	Variation
V32	SB	65	Crest	2.47	2.48	4.95	1300.00	262.51	1000.00	955.76	OK
V33	NB	65	Crest	2.50	2.50	5.00	1300.00	260.09	1000.00	964.67	OK
V34	SB	65	Sag	2.484	0.000	2.484	800.00	322.06	800.00	389.99	OK
V35	NB	65	Sag	2.496	0.000	2.496	800.00	320.46	800.00	391.93	OK
V36	SB	65	Sag	0.000	2.478	2.478	600.00	242.16	800.00	389.00	Variation
V37	NB	65	Sag	0.000	2.515	2.515	600.00	238.60	800.00	394.81	Variation
V38	SB	65	Crest	2.478	2.007	4.485	1170.00	260.86	1800.00	865.62	Variation
V39	NB	65	Crest	2.515	2.023	4.538	1170.00	257.82	1800.00	875.85	Variation

Table 2-7
Existing Vertical Alignment- Vertical Stopping Sight Distance

Curve No.	Baseline	Vertical Curve Type	Grade		Δ G	Existing Curve Length (ft.)	Existing SSD		Criteria - SSD		Variation or Exception
			Back	Ahead			PPM	AASHTO	PPM	AASHTO	
V2	NB & SB	Crest	3.000	3.000	6.000	1800.00	631.46	804.67	730.00	645.00	Variation
V6	NB & SB	Crest	2.522	2.434	4.956	1500.00	634.26	808.23	730.00	645.00	Variation
V9	NB & SB	Crest	1.500	0.500	2.000	640.00	652.17	831.06	730.00	645.00	Variation
V13	NB	Crest	0.300	0.300	0.600	500.00	1052.44	1341.11	730.00	645.00	OK
V14	SB	Crest	0.300	0.300	0.600	500.00	1052.44	1341.11	730.00	645.00	OK
V16	NB & SB	Crest	0.300	0.300	0.600	500.00	1052.44	1341.11	730.00	645.00	OK
V18	NB & SB	Crest	3.000	3.000	6.000	1800.00	631.46	804.67	730.00	645.00	Variation
V21	NB & SB	Crest	0.400	0.9	1.300	1000.00	1011.15	1288.50	730.00	645.00	OK
V23	SB	Crest	0.4200	0.3700	0.790	1000.00	1297.10	1652.88	730.00	645.00	OK
V24	NB	Crest	0.420	0.300	0.720	1000.00	1358.60	1731.25	730.00	645.00	OK
V32	SB	Crest	2.47	2.48	4.952	1300.00	590.70	752.72	730.00	645.00	Variation
V33	NB	Crest	2.50	2.50	4.998	1300.00	587.96	749.23	730.00	645.00	Variation
V38	SB	Crest	2.478	2.007	4.485	1170.00	588.84	750.35	730.00	645.00	Variation
V39	NB	Crest	2.515	2.023	4.538	1170.00	585.39	745.95	730.00	645.00	Variation



REVISIONS			
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CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

EXISTING GEOMETRY
FIGURE 2-5

SHEET NO.
27

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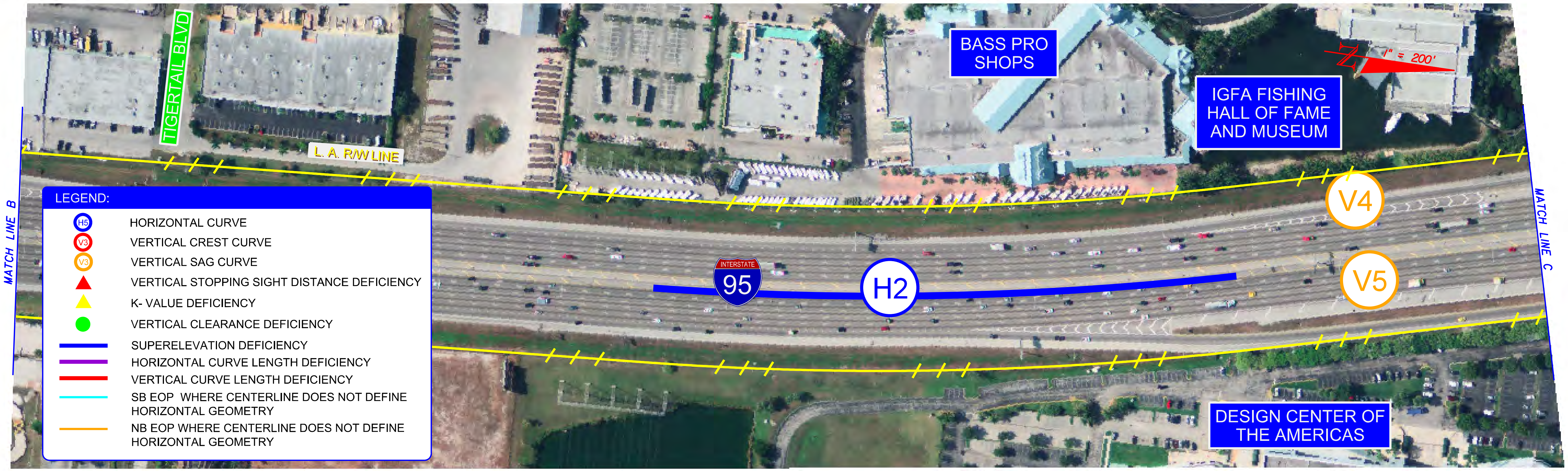

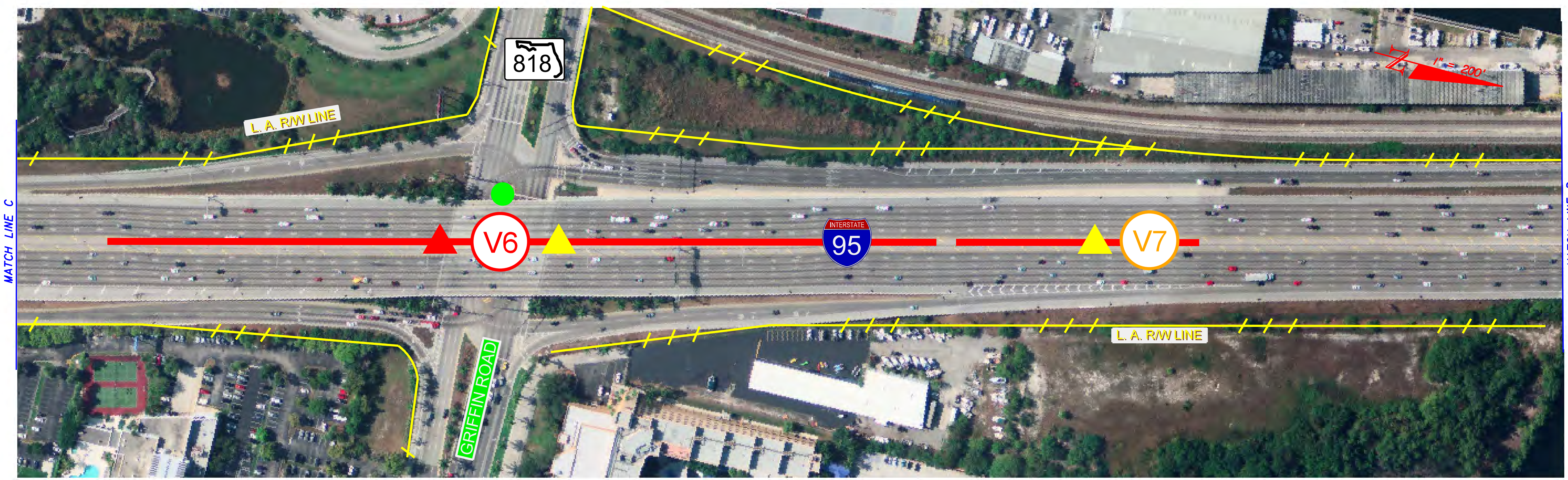

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

EXISTING GEOMETRY
FIGURE 2-5

SHEET NO.
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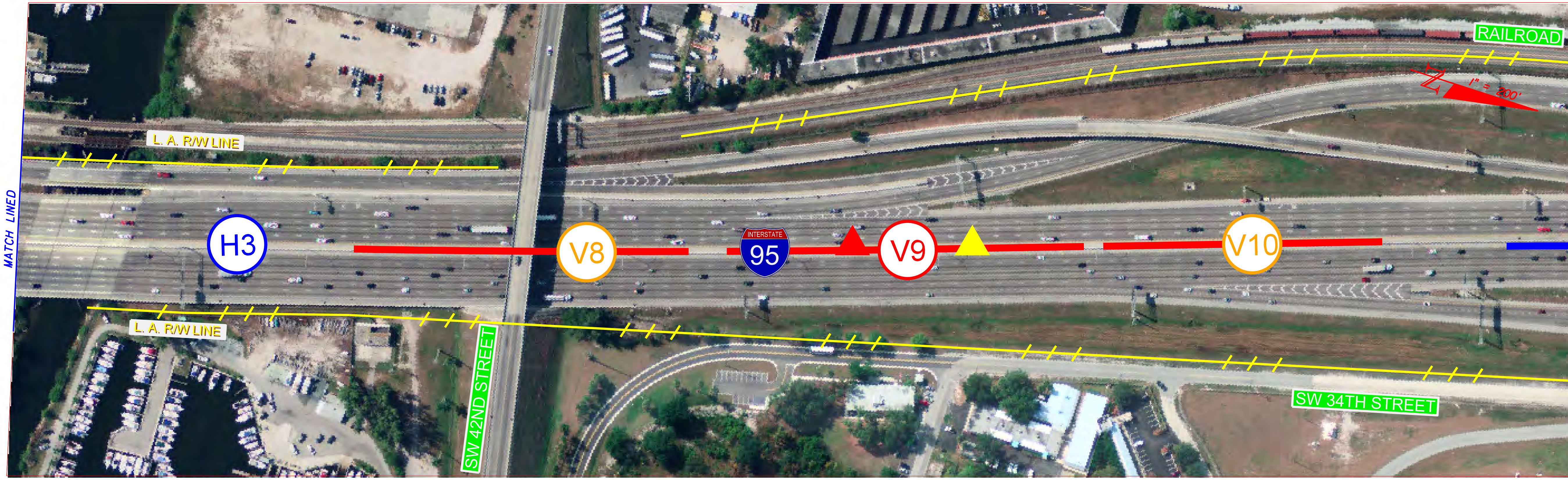

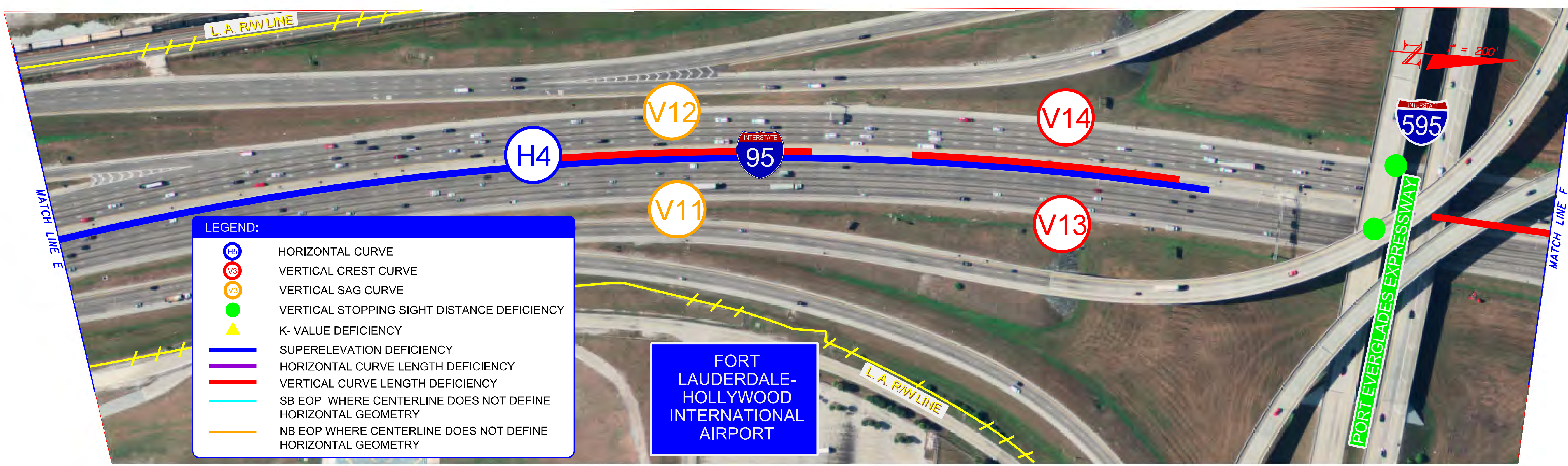

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

EXISTING GEOMETRY
FIGURE 2-5

SHEET NO.
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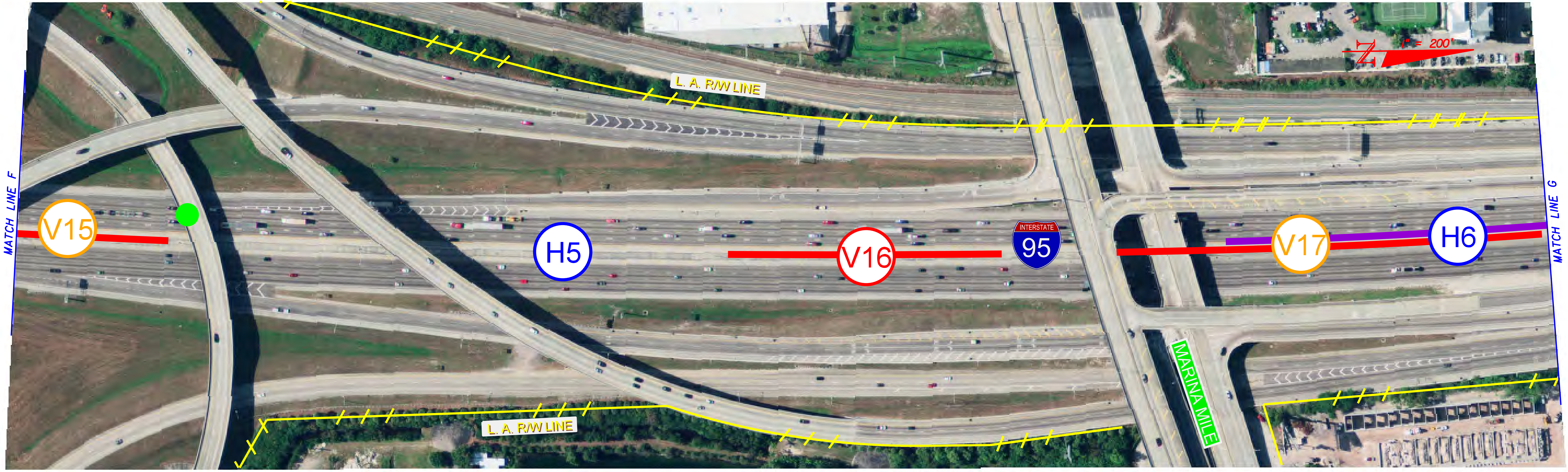

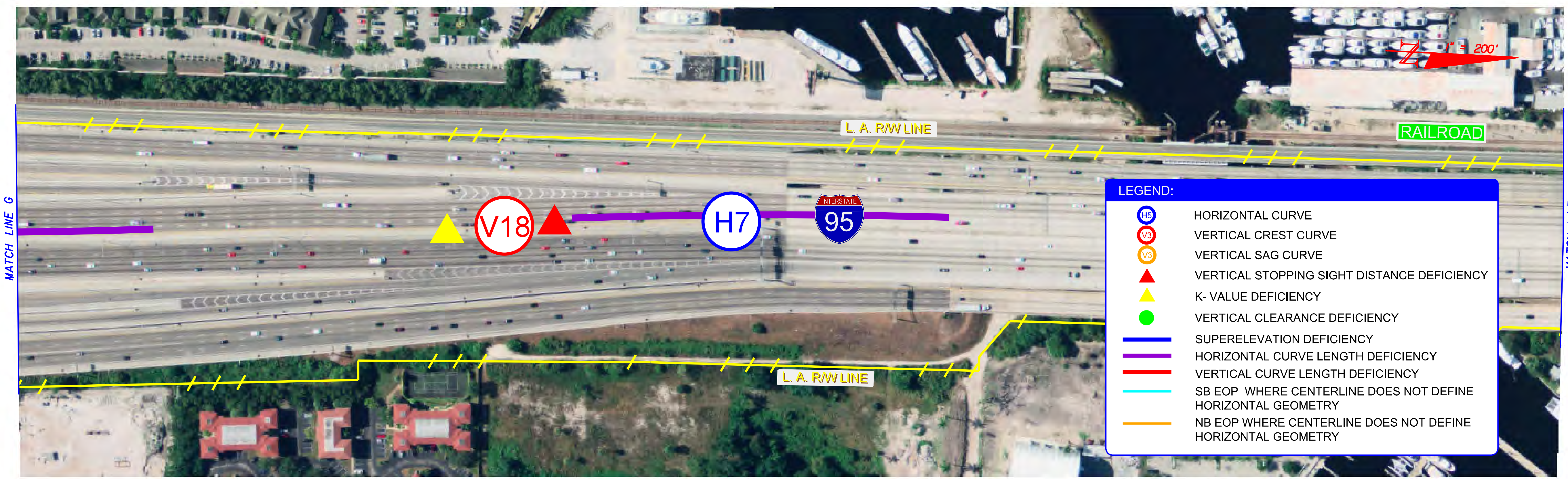

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SR-9	BROWARD	429804-1-22-01

EXISTING GEOMETRY
FIGURE 2-5

SHEET NO.
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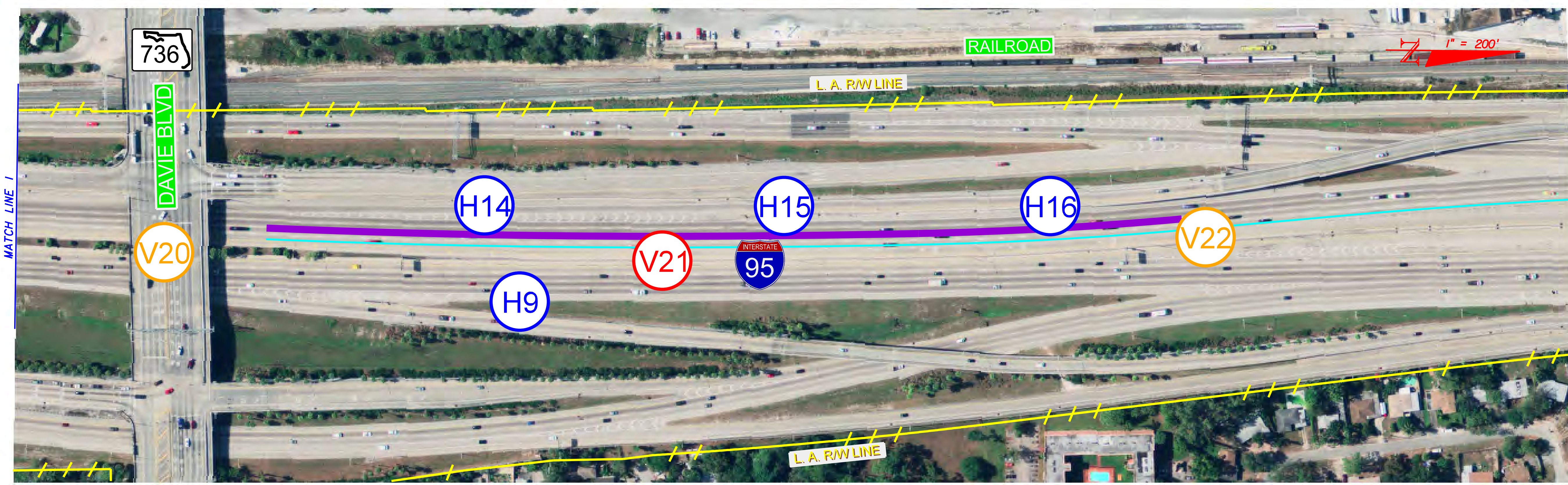

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DEPARTMENT OF TRANSPORTATION

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SR-9	BROWARD	429804-1-22-01

EXISTING GEOMETRY
FIGURE 2-5

SHEET NO.
31

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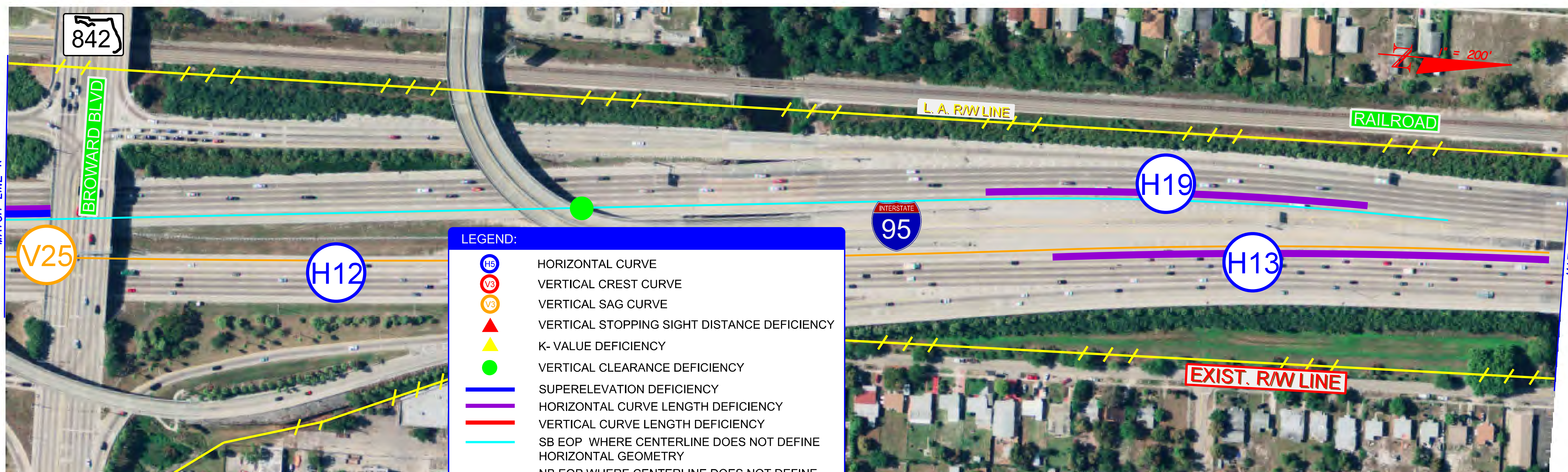

LEGEND:

H5	HORIZONTAL CURVE
V3	VERTICAL CREST CURVE
V3	VERTICAL SAG CURVE
▲	VERTICAL STOPPING SIGHT DISTANCE DEFICIENCY
▲	K- VALUE DEFICIENCY
●	VERTICAL CLEARANCE DEFICIENCY
—	SUPERELEVATION DEFICIENCY
—	HORIZONTAL CURVE LENGTH DEFICIENCY
—	VERTICAL CURVE LENGTH DEFICIENCY
—	SB EOP WHERE CENTERLINE DOES NOT DEFINE HORIZONTAL GEOMETRY
—	NB EOP WHERE CENTERLINE DOES NOT DEFINE HORIZONTAL GEOMETRY

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SR-9	BROWARD	429804-1-22-01

EXISTING GEOMETRY
FIGURE 2-5

SHEET NO.
32

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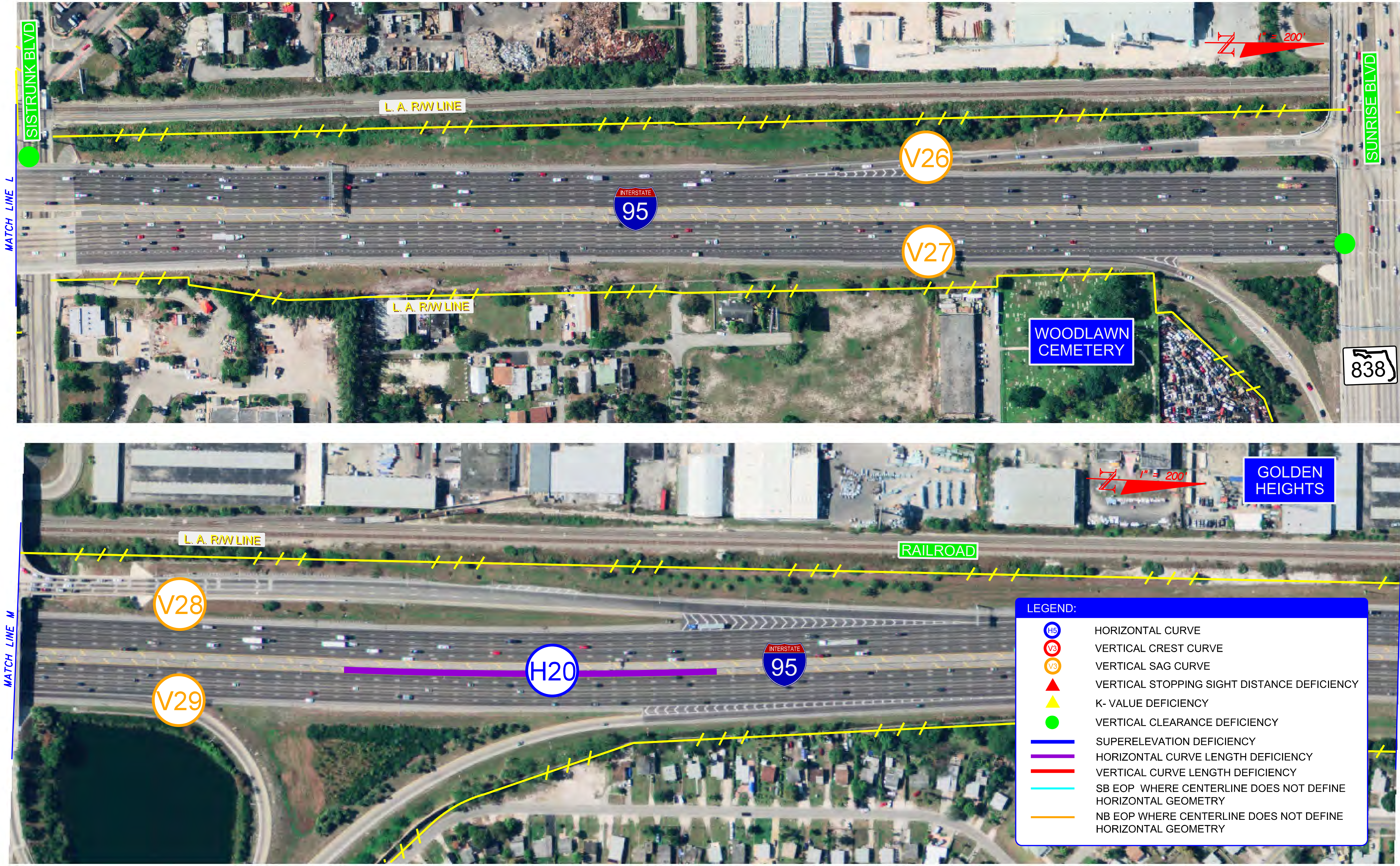

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DEPARTMENT OF TRANSPORTATION

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SR-9	BROWARD	429804-1-22-01

EXISTING GEOMETRY
FIGURE 2-5

SHEET NO.
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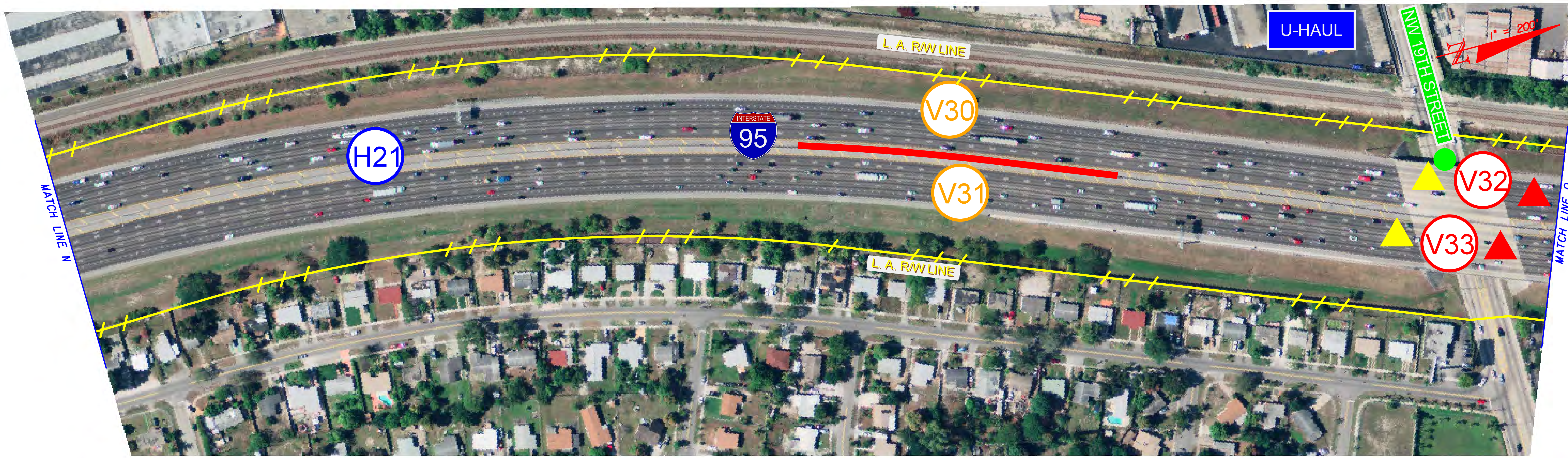

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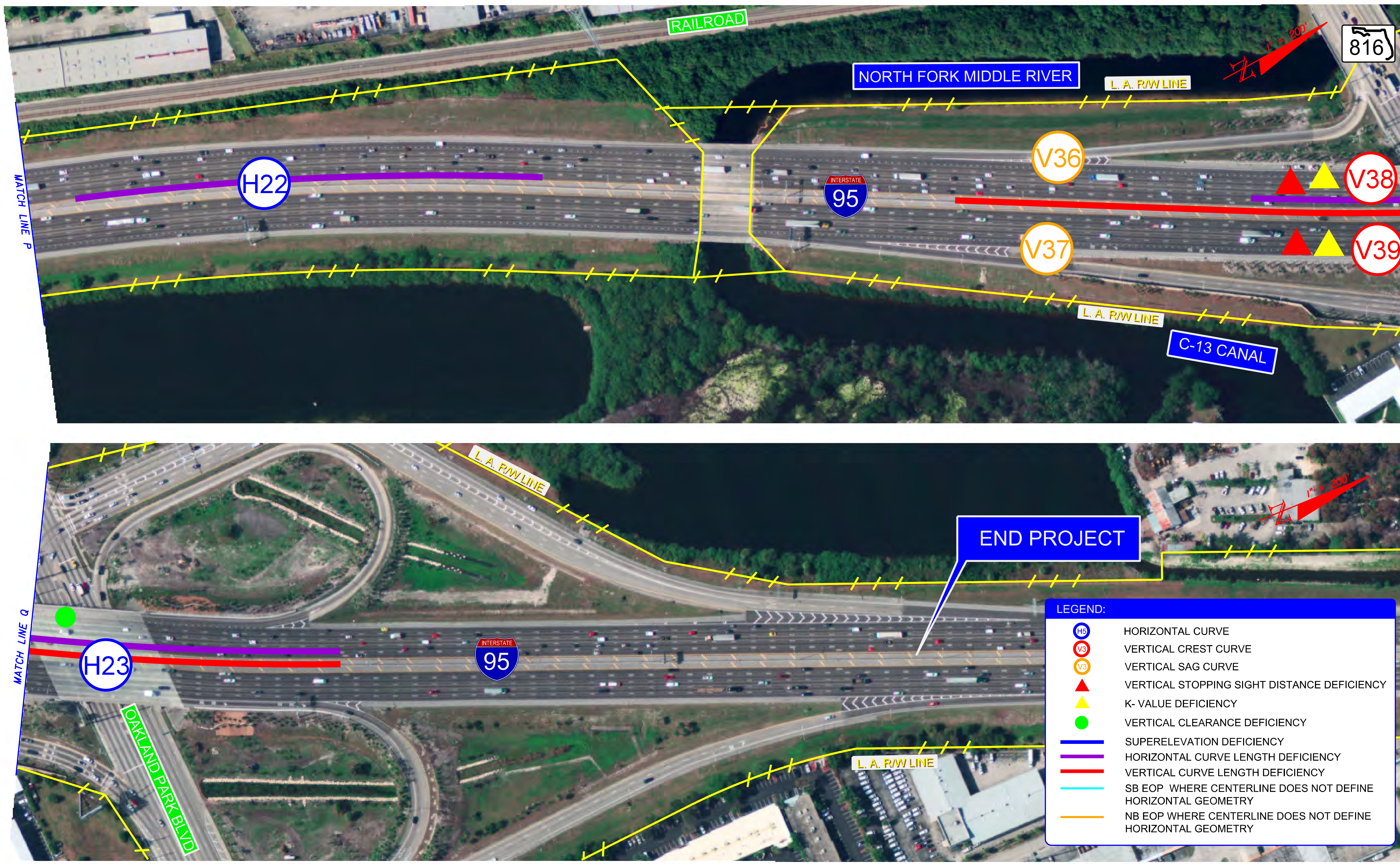
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

EXISTING GEOMETRY
FIGURE 2-5

SHEET NO.



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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

EXISTING GEOMETRY
FIGURE 2-5

SHEET NO.
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2.5.4 Horizontal Clearance

The FDOT PPM requires 36 ft. of recoverable terrain from the edge of travel lane and multilane ramps, and 24 ft. for auxiliary lanes and single lane ramps. The AASHTO 2011 Roadside Design Guide, Table 3-1 requires 30 ft. to 34 ft. of recoverable terrain from edge of travel lane. Chapter 2 of the FDOT PPM states that all above ground fixed objects should be outside the clear zone. Within the project limits, four unprotected objects are located within the clear zone, as listed below:

- The drainage outfall structure at Station 1002+00 has a front slope of 1:3 and is located 21 ft. from the existing edge of pavement of the northbound I-95 lanes.
- An overhead sign structure along the southbound lanes at Station 1001+50 is located 19.5 ft. from the auxiliary lane.
- The pier located between the I-95 NB mainline and the I-95 NB off-ramp to SR 84 for Bridge No. 860538 (I-595 WB to I-95 NB) is located 30 ft. from the edge of travel lane.
- The light poles within the swale in the vicinity of the North Woodlawn Cemetery are 8 ft. from the auxiliary lane. As per FDOT PPM Table 2.11.2, conventional lighting should be located no closer than 20 ft. from the travel lane or 14 ft. from an auxiliary lane.

2.5.5 Vertical Clearance

The primary function of vertical clearance to structures going over roadways consists of providing safe passage to tall design vehicles beneath these structures. The FDOT PPM specifies that the highest point on the roadway below a bridge structure has to measure a minimum of 16.5 ft. to the lowest point (low member) beneath the structure. This includes provisions for a future underpass resurfacing of 6 in. over the existing pavement elevation.

AASHTO requires a minimum vertical clearance of 16 ft. for structures passing over roadway including auxiliary lanes and the usable width of shoulders. Further guidance allows a minimum vertical clearance of 14 ft. in highly urbanized areas provided there is an alternate facility with the minimum 16 ft. clearance.

An evaluation of the vertical clearance at the underpasses of the project corridor was completed to identify deficiencies. Based on the survey completed as part of this study, all vertical clearances at the bridges that cross over I-95 (overpasses) meet the minimum AASHTO criterion of 16 ft. However, there are nine vertical clearances that do not meet the FDOT PPM criterion. **Table 2-8** summarizes the existing deficient vertical clearances along the project corridor. A review of the existing structures and vertical clearances along the project corridor is presented in **Table 2-22** and **Section 2.15**.

Table 2-8 Deficient Vertical Clearances				
Location	**Minimum Vertical Clearance (ft.)**	**PPM (ft.)**	**AASHTO (ft.)**	**Variation/ Exception**
I-595 EB over I-95 NB	16.43	16.50	16.00	Variation
I-595 WB over I-95 NB	16.43	16.50	16.00	Variation
WB I-595 to SB I-95 over I-95	16.33	16.50	16.00	Variation
PNR #2 to I-95 ramp over I-95 SB	16.02	16.50	16.00	Variation
Sunrise Boulevard (SR 838) over I-95	16.41	16.50	16.00	Variation
I-95 over Griffin Road (SR 818)	16.10	16.50	16.00	Variation
I-95 over NW 6th Street	16.35	16.50	16.00	Variation
I-95 over NW 19th Street	14.78	16.50	16.00	Variation*
I-95 over Oakland Park Boulevard (SR 816)	15.05	16.50	16.00	Variation*

*14 feet allowed in highly developed urban areas if alternate route has 16 feet.

2.5.6 Design Speed and Posted Speed

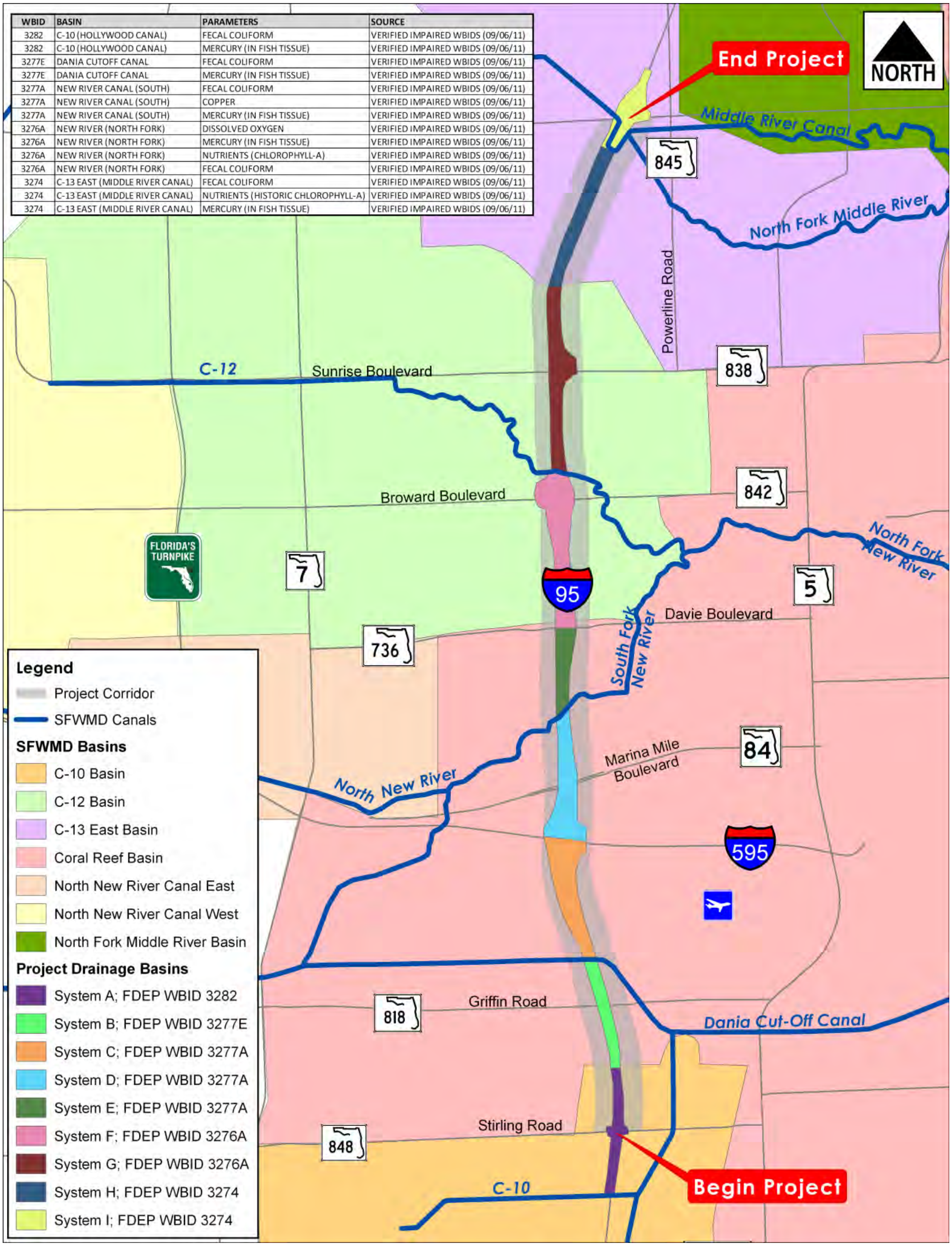
A review of existing plans provided by the FDOT indicated that the design speed for the study corridor has varied from 60 mph for the original design to 70 mph for subsequent resurfacing projects. The existing posted speed for the corridor is 65 mph. A speed study performed by FDOT in 2011 determined that a design speed of 65 mph is appropriate for this corridor. Considering the posted speed, geometry of existing roadway features, and results of the speed study, a 65 mph design speed was established for the corridor.

2.6 Existing Drainage

The project corridor lies within South Florida Water Management District (SFWMD) regional basins C-10, Coral Reef, C-12 and C-13 East. A review of Geographical Information System (GIS) data sets from the Florida Department of Environmental Protection (FDEP) indicates that each segment of the study corridor falls within a watershed identified as impaired. As such, the water quality calculations for this project will include a nutrient loading analysis to comply with FDOT District 4 Environmental Permitting Guidelines. See **Figure 2-6** below for FDEP basin identification.

Most of the project corridor is within the 100-Year floodplain Zone AE with the exception of an area, approximately one mile long from Sunrise Boulevard (SR 838) towards the north, which is outside the floodplain (Zone x). Base flood elevations within Zone AE range from 4.4 ft. to 5.4 ft. North American Vertical Datum (NAVD). Based on limited elevation data available during this study, the proposed outside roadway edge of pavement is no lower than elevation 5.5 ft. NAVD. As such, this roadway is anticipated to remain open during the 100-year flood event. See the **Location Hydraulics Memorandum** on file at FDOT District 4 for detailed floodplain information.

In general, stormwater runoff is conveyed through storm drains and swales towards one of the several major canals, which cross the study corridor, as shown in Figure 2-6. The existing stormwater management systems consist mostly of dry-detention swales in the southern end of the project and retention areas within the interchanges while the northern end is mostly free discharge. Based on geotechnical explorations conducted for this study, the Seasonal High Ground Water Table (SHGWT) is estimated to be less than 1 ft. below the existing swale bottom in the southern end of the project.



WBID	BASIN	PARAMETERS	SOURCE
3282	C-10 (HOLLYWOOD CANAL)	FECAL COLIFORM	VERIFIED IMPAIRED WBIDS (09/06/11)
3282	C-10 (HOLLYWOOD CANAL)	MERCURY (IN FISH TISSUE)	VERIFIED IMPAIRED WBIDS (09/06/11)
3277E	DANIA CUTOFF CANAL	FECAL COLIFORM	VERIFIED IMPAIRED WBIDS (09/06/11)
3277E	DANIA CUTOFF CANAL	MERCURY (IN FISH TISSUE)	VERIFIED IMPAIRED WBIDS (09/06/11)
3277A	NEW RIVER CANAL (SOUTH)	FECAL COLIFORM	VERIFIED IMPAIRED WBIDS (09/06/11)
3277A	NEW RIVER CANAL (SOUTH)	COPPER	VERIFIED IMPAIRED WBIDS (09/06/11)
3277A	NEW RIVER CANAL (SOUTH)	MERCURY (IN FISH TISSUE)	VERIFIED IMPAIRED WBIDS (09/06/11)
3276A	NEW RIVER (NORTH FORK)	DISSOLVED OXYGEN	VERIFIED IMPAIRED WBIDS (09/06/11)
3276A	NEW RIVER (NORTH FORK)	MERCURY (IN FISH TISSUE)	VERIFIED IMPAIRED WBIDS (09/06/11)
3276A	NEW RIVER (NORTH FORK)	NUTRIENTS (CHLOROPHYLL-A)	VERIFIED IMPAIRED WBIDS (09/06/11)
3276A	NEW RIVER (NORTH FORK)	FECAL COLIFORM	VERIFIED IMPAIRED WBIDS (09/06/11)
3274	C-13 EAST (MIDDLE RIVER CANAL)	FECAL COLIFORM	VERIFIED IMPAIRED WBIDS (09/06/11)
3274	C-13 EAST (MIDDLE RIVER CANAL)	NUTRIENTS (HISTORIC CHLOROPHYLL-A)	VERIFIED IMPAIRED WBIDS (09/06/11)
3274	C-13 EAST (MIDDLE RIVER CANAL)	MERCURY (IN FISH TISSUE)	VERIFIED IMPAIRED WBIDS (09/06/11)

Figure 2-6
Drainage Basins

2.7 Existing Intersections and Signalization

A field review of the corridor indicated that there are 26 intersections within the project corridor, all of which are formed by ramp terminals intersecting cross streets. Fourteen of these intersections are signalized. **Table 2-9** presents the existing intersections along the project corridor.

Table 2-9
Existing Intersections

Interchange	Ramp/Intersection	Signalized (Yes/No)
Stirling Road (SR 848)	NB Ramps	Yes
	SB Ramps	Yes
Griffin Road (SR 818)	NB Ramps	Yes
	SB Ramps	Yes
SR 84	NB Exit Ramp	Yes
	WB to NB Entrance Ramp	No
	EB to NB Entrance Ramp	No
	SB to WB Exit Ramp	No
	SB to EB Exit Ramp	Yes
	WB to SB Entrance Ramp	No
	EB to SB Entrance Ramp	No
Davie Boulevard (SR 736)	NB Ramps	Yes
	SB Ramps	Yes
Broward Boulevard (SR 842)	NB Exit Ramp	Yes
	WB to NB Entrance Ramp	No
	EB to NB Entrance Ramp	No
	SB Ramps	Yes
Sunrise Boulevard (SR 838)	NB to EB Exit Ramp	No
	NB to WB Exit Ramp	No
	NB Entrance Ramp	No
	SB Ramps	Yes
Oakland Park Boulevard (SR 816)	NB to EB Exit Ramp	Yes
	NB to WB Exit Ramp and NB Entrance Ramp	Yes
	SB Exit Ramp	Yes
	EB to SB Entrance Ramp	No
	WB to SB Entrance Ramp	No

2.8 Traffic Data

A traffic operational analysis was performed as part of this study. Traffic data was collected in 2011 to evaluate the existing conditions and provide a basis for future traffic analysis. The traffic count data included the following:

- I-95 Mainline 24-hour bi-directional vehicle classifications
- I-95 Mainline 48-hour bi-directional vehicle volumes in 15-minute intervals
- I-95 Mainline Travel Time Runs
- Arterial/Ramp 72-hour bi-directional Automatic Traffic Recorder (ATR) hose-counts
- Turning Movement Counts (TMC) in 15-minute intervals

- Traffic Signal Information from Broward County Traffic Engineering Division
- Field observations at each intersection

The existing operations analysis included mainline, weaving sections, off/on ramps, and signalized intersections with the ramps. The details of the traffic data collection and traffic operational analysis are provided in the **Existing Conditions Traffic Operational Analysis** on file at FDOT District 4. The following sections summarize the existing Annual Average Daily Traffic (AADT) and peak hour volumes, freeway segment, and intersection operations.

2.8.1 Existing AADT and Peak Hour Volumes

The existing Annual Average Daily Traffic (AADT) volumes for the morning and evening peak periods along the major mainline segments are summarized in **Table 2.10**.

Table 2-10
Existing (2011) Traffic Volumes

Segment	AADT (vpd)	Peak Period Traffic Volume (vph)	
		AM	PM
Northbound			
From Sheridan Street (SR 822) to Stirling Road (SR 848)	140,000	9,430	9,080
From Stirling Road (SR 848) to Griffin Road (SR 818)	140,200	9,460	9,110
From Griffin Road (SR 818) to I-595	138,400	9,100	9,060
From I-595 to Davie Boulevard (SR 736)	102,800	6,360	6,800
From Davie Boulevard (SR 736) to Broward Boulevard (SR 842)	130,050	8,420	8,600
From Broward Boulevard (SR 842) to Sunrise Boulevard (SR 838)	148,700	9,640	10,150
From Sunrise Boulevard (SR 838) to Oakland Park Boulevard (SR 816)	140,800	9,130	9,150
From Oakland Park Boulevard (SR 816) to Commercial Boulevard (SR 870)	135,300	8,610	8,330
Southbound			
From Commercial Boulevard (SR 870) to Oakland Park Boulevard (SR 816)	129,200	8,070	8,910
From Oakland Park Boulevard (SR 816) to Sunrise Boulevard (SR 838)	136,600	8,640	9,320
From Sunrise Boulevard (SR 838) to Broward Boulevard (SR 842)	143,400	8,860	9,710
From Broward Boulevard (SR 842) to Davie Boulevard (SR 736)	124,750	7,220	8,490
From Davie Boulevard (SR 736) to I-595	102,100	5,750	6,780
From I-595 to Griffin Road (SR 818)	126,500	7,170	8,280
From Griffin Road (SR 818) to Stirling Road (SR 848)	138,100	7,840	9,210
From Stirling Road (SR 848) to Sheridan Street (SR 822)	137,000	7,800	9,020

vpd: vehicles per day, vph: vehicles per hour
Source: Appendix A of the Existing Conditions Traffic Operational Analysis, August 2012, on file at FDOT District 4.

2.8.2 Analysis of Existing Conditions

The performance of the project corridor under existing conditions was evaluated using several measures of effectiveness, some of which are briefly described in the following sections. For more details, refer to the **Existing Conditions Traffic Operational Analysis** on file at FDOT District 4.

2.8.2.1 Freeway Segment Analysis

The various freeway segments (basic, on/off ramps, and weaving segments) were analyzed for the AM and PM peak hours using Highway Capacity Software (HCS). **Table 2-11** (northbound direction) and **Table 2-12** (southbound direction) include the delay (sec/veh) and Level of Service (LOS) results for the various freeway segments. In total, there were 24 segments for both northbound and southbound directions.

Northbound I-95

- AM Peak Hour: A total of 4 out of the 24 segments analyzed (15%) are operating at capacity (LOS E) during the AM peak hour.
- PM Peak Hour: A total of 2 out of the 24 segments analyzed (8%) are failing (LOS F) during the PM peak hour. These 2 segments include the NB on-ramp from Broward Boulevard (SR 842) and the NB on-ramp from the Broward Boulevard Park and Ride.

Southbound I-95

- AM Peak Hour: A total of 2 out of 24 segments analyzed (8%) are operating at capacity (LOS E). This finding implies that the level of congestion for the southbound direction is not as severe as the northbound direction.
- PM Peak Hour: A total of 4 out of 24 segments analyzed (15%) are operating at capacity (LOS E) or failing (LOS F) during the PM peak hour. The segments that are failing include the SB I-95 off-ramp to Davie Boulevard (SR 736) / I-595 and the SB I-95 on-ramp from I-595.

In general, the AM and PM peak hour traffic operation results indicate that congestion along I-95 is worse during the afternoon peak hour than during the morning peak hour.

Table 2-11
Existing Freeway Segments Analysis - Northbound

Location	Type	LOS	
		AM	PM
Between NB I-95 off-ramp to Stirling Road (SR 848) and NB I-95 on-ramp from Stirling Road (SR 848)	Basic	D	C
Between NB I-95 on-ramp from Stirling Road (SR 848) and NB I-95 off-ramp to Griffin Road (SR 818)	Weaving	D	C
Between NB I-95 off-ramp to Griffin Road (SR 818) and NB I-95 on-ramp from Griffin Road (SR 818)	Basic	D	D
Between NB I-95 on-ramp from Griffin Road (SR 818) and NB I-95 off-ramp to I-595	Weaving	D	D
Between NB I-95 off-ramp to I-595 and NB I-595 off-ramp to SR 84	Basic	C	D
NB I-95 off ramp to SR 84	Off-ramp	B	C
Between NB I-95 off-ramp to SR 84 and NB I-95 on-ramp from SR 84	Basic	C	D
NB I-95 on-ramp from SR 84	On-ramp	B	B
NB I-95 off-ramp to Davie Boulevard (SR 736)	Off-ramp	C	C
NB I-95 off-ramp to Broward Boulevard (SR 842)	Off-ramp	C	D
NB I-95 off-ramp to Broward Boulevard (SR 842) Park and Ride	Off-ramp	C	C
Between NB I-95 off-ramp Park and Ride at Broward Boulevard (SR 842) and NB I-95 on-ramp from Davie Boulevard (SR 736)	Basic	C	C
NB I-95 on-ramp from Davie Boulevard (SR 736)	On-ramp	C	C
Between NB I-95 on-ramp from Davie Boulevard (SR 736) and NB I-95 on-ramp from Broward Boulevard (SR 842)	Basic	D	D
NB I-95 on-ramp from Broward Boulevard (SR 842)	On-ramp	C	F
NB I-95 on-ramp from Broward Boulevard (SR 842) Park and Ride	On-ramp	E	F
NB I-95 off-ramp to Sunrise Boulevard (SR 838) EB	Off-ramp	E	D
NB I-95 off-ramp to Sunrise Boulevard (SR 838) WB	Off-ramp	E	D
Between NB I-95 off-ramp to Sunrise Boulevard (SR 838) WB and NB I-95 on-ramp from Sunrise Boulevard (SR 838)	Basic	D	D
NB I-95 on-ramp from Sunrise Boulevard (SR 838)	On-ramp	C	C
Between NB I-95 on-ramp from Sunrise Boulevard (SR 838) and NB I-95 off-ramp to Oakland Park Boulevard (SR 816)	Basic	C	C
NB I-95 off-ramp to Oakland Park Boulevard (SR 816) EB	Off-ramp	D	C
NB I-95 off-ramp to Oakland Park Boulevard (SR 816) WB	Off-ramp	E	C
Between NB I-95 off-ramp to Oakland Park Boulevard (SR 816) and NB I-95 on-ramp from Oakland Park Boulevard (SR 816)	Basic	C	C

Source: Table 4-4 and 4-6 of the Existing Conditions Traffic Operational Analysis, August 2012, on file at FDOT District 4.

Table 2-12
Existing Freeway Segment Analysis - Southbound

Location	Type	LOS	
		AM	PM
Between SB I-95 off-ramp to Oakland Park Boulevard (SR 816) and SB I-95 on-ramp from Oakland Park Boulevard (SR 816)	Basic	C	C
SB I-95 on-ramp from Oakland Park Boulevard (SR 816) WB	On-ramp	C	C
SB I-95 on-ramp from Oakland Park Boulevard (SR 816) EB	On-ramp	C	C
Between SB I-95 on-ramp from Oakland Park Boulevard (SR 816) EB and SB I-95 off-ramp from Sunrise Boulevard (SR 838)	Basic	C	C
SB I-95 off-ramp to Sunrise Boulevard (SR 838)	Off-ramp	E	E
Between SB I-95 off-ramp to Sunrise Boulevard (SR 838) and SB I-95 on-ramp from Sunrise Boulevard (SR 838)	Basic	C	D
Between SB I-95 on-ramp from Sunrise Boulevard (SR 838) and SB I-95 off-ramp to Broward Boulevard (SR 842)	Weaving	D	D
SB I-95 off-ramp to Broward Boulevard (SR 842) Park and Ride	Off-ramp	E	E
Between SB I-95 off-ramp to Broward Boulevard (SR 842) and SB I-95 off-ramp to Davie Boulevard (SR 736)/I-595	Basic	C	D
SB I-95 off-ramp to Davie Boulevard (SR 736)/I-595	Off-ramp	C	F
Between SB I-95 off-ramp to Davie Boulevard (SR 736)/I-595 and SB I-95 on-ramp from Broward Boulevard (SR 842) Park and Ride	Basic	B	C
SB I-95 on-ramp from Broward Boulevard (SR 842) Park and Ride	On-ramp	B	C
SB I-95 on-ramp from Broward Boulevard (SR 842)	On-ramp	C	D
Between SB I-95 on-ramp from Broward Boulevard (SR 842) and SB I-95 on-ramp from Davie Boulevard (SR 736)	Basic	C	C
SB I-95 on-ramp from Davie Boulevard (SR 736)	On-ramp	D	D
SB I-95 off-ramp to SR 84	Off-ramp	D	D
Between SB I-95 off-ramp to SR 84 and SB I-95 on-ramp from SR 84	Basic	B	C
I-95 on-ramp from SR 84	On-ramp	B	C
SB I-95 off-ramp to Griffin Road (SR 818)	Off-ramp	C	D
Between SB I-95 off-ramp to Griffin Road (SR 818) and SB I-95 on-ramp from I-595	Basic	B	C
SB I-95 on-ramp from I-595	On-ramp	D	F
Between SB I-95 on-ramp from I-595 and SB I-95 on-ramp from Griffin Road (SR 818)	Basic	C	D
Between SB I-95 on-ramp from Griffin Road (SR 818) and SB I-95 off-ramp to Stirling Road (SR 848)	Weaving	C	D
Between SB I-95 off-ramp to Stirling Road (SR 848) and I-95 on-ramp from Stirling Road (SR 848)	Basic	C	D

Source: Table 4-5 and 4-7 of the Existing Conditions Traffic Operational Analysis, August 2012, on file at FDOT District 4.

2.8.2.2 Existing Intersection Operations

The existing intersection operational analysis was performed for the signalized intersections using SYNCHRO Version 8.0 and the Highway Capacity Manual (HCM) 2000. **Table 2-13** and **Table 2-14** present the intersection analysis results for both the AM and PM peak hours, respectively. The only failing intersection (LOS F) is the Broward Boulevard (SR 842) and NB ramp intersection during both AM and PM peak hours. A few other intersections have individual movements operating at LOS F while the overall intersection LOS is acceptable.

Table 2-13
Existing Intersection Performance – AM Peak Hour

Ramp/Intersection	Intersection Delay (sec/veh)	Intersection LOS	Approach	Approach Delay (sec/veh)	Approach LOS
Oakland Park Boulevard (SR 816) SB Ramps	12.5	B	EB	14.9	B
			WB	6.4	A
			SB	19.5	B
Oakland Park Boulevard (SR 816) NB Ramps	9.5	A	EB	5.3	A
			WB	15.4	B
			SB	11.9	B
Sunrise Boulevard (SR 838) SB Ramps	30.3	C	EB	28.2	C
			WB	25.2	C
			SB	41.8	D
Sunrise Boulevard (SR 838) NB Ramps	8.0	A	EB	2.3	A
			WB	15.5	B
Broward Boulevard (SR 842) SB Ramps	48.5	D	EB	53.6	D
			WB	40.1	D
			SB	52.6	D
Broward Boulevard (SR 842) NB Ramps	150.3	F	EB	1.3	A
			WB	34.1	C
			NB	759.7	F
Davie Boulevard (SR 736) SB Ramps	66.8	E	EB	56.8	E
			WB	13.5	B
			SB	198.8	F
Davie Boulevard (SR 736) NB Ramps	44.2	D	EB	35.0	D
			WB	35.0	D
			NB	68.9	E
Griffin Road (SR 818) SB Ramps	30.7	C	EB	34.1	C
			WB	5.3	A
			SB	55.6	E
Griffin Road (SR 818) NB Ramps	42.2	D	EB	33.0	C
			WB	34.7	C
			NB	56.8	E
Stirling Road (SR 848) SB Ramps	36.5	D	EB	54.9	D
			WB	12.4	B
			SB	34.3	C
Stirling Road (SR 848) NB Ramps	45.2	D	EB	18.9	B
			WB	60.3	E
			NB	70.9	E

Source: Table 4-9 of the Existing Conditions Traffic Operational Analysis, August 2012, on file at FDOT District 4.

Table 2-14 Existing Intersection Performance – PM Peak Hour					
Ramp/Intersection	**Intersection Delay (sec/veh)**	**Intersection LOS**	**Approach**	**Approach Delay (sec/veh)**	**Approach LOS**
Oakland Park Boulevard (SR 816) SB Ramps	13.3	B	EB	13.7	B
			WB	10.2	B
			SB	20.4	C
Oakland Park Boulevard (SR 816) NB Ramps	11.0	B	EB	4.4	A
			WB	18.7	B
			SB	12.0	B
Sunrise Boulevard (SR 838) SB Ramps	33.2	C	EB	26.6	C
			WB	20.9	C
			SB	79.4	E
Sunrise Boulevard (SR 838) NB Ramps	11.3	B	EB	2.3	A
			WB	17.8	B
Broward Boulevard (SR 842) SB Ramps	62.0	E	EB	45.3	D
			WB	55.8	E
			SB	89.8	F
Broward Boulevard (SR 842) NB Ramps	354.8	F	EB	0.7	A
			WB	43.2	D
			NB	1417.6	F
Davie Boulevard (SR 736) SB Ramps	41.2	D	EB	28.8	C
			WB	17.8	B
			SB	133.8	F
Davie Boulevard (SR 736) NB Ramps	36.4	D	EB	18.9	B
			WB	33.4	C
			NB	57.2	E
Griffin Road (SR 818) SB Ramps	38.2	D	EB	30.6	C
			WB	20.4	C
			SB	72.7	E
Griffin Road (SR 818) NB Ramps	61.8	E	EB	34.4	C
			WB	32.0	C
			NB	140.7	F
Stirling Road (SR 848) SB Ramps	57.2	E	EB	39.3	D
			WB	13.8	B
			SB	155.1	F
Stirling Road (SR 848) NB Ramps	62.0	E	EB	23.7	C
			WB	46.5	D
			NB	151.1	F

Source: Table 4-10 of the Existing Conditions Traffic Operational Analysis, August 2012, on file at FDOT District 4.

2.9 Safety Analysis

A safety analysis was conducted as part of this study to identify crash patterns, probable contributing cases, countermeasures and to provide recommendations for further studies, if needed. Crash analysis was performed for the mainline and ramps of the project corridor.

Capacity improvements are recommended to enhance the overall safety along the project corridor. The following section summarizes the safety analysis performed as part of this study. The detailed **Safety Analysis Report** is on file at FDOT District 4.

2.9.1 Crash Data

Crash data for the I-95 project corridor was obtained from the FDOT Crash Analysis Reporting System (CAR) database for the five-year period from 2006 to 2010. The database provides roadway, environmental and driver characteristics that were existent at the time of each crash.

2.9.2 Summary of Crash Frequency and Severity

Table 2-15 and **Figure 2-7** presents a summary of the crash frequency, severity and historical trend for the mainline by direction and interchange ramps within the project corridor.

Table 2-15
Crash Frequency by Severity

Roadway Type	Severity	2006	2007	2008	2009	2010	5 Year Total	Mean Crashes Per Year
I-95 Mainline - NB	Fatal	0	3	4	5	5	17	3
	Injury	139	205	180	194	248	966	193
	PDO	138	210	199	164	202	913	183
	Total	***277***	***418***	***383***	***363***	***455***	***1896***	***379***
	Fatalities	***0***	***3***	***4***	***5***	***5***	***17***	***3***
I-95 Mainline - SB	Fatal	6	3	5	3	4	21	4
	Injury	108	161	134	161	177	741	148
	PDO	128	188	190	159	143	808	162
	Total	***242***	***352***	***329***	***323***	***324***	***1570***	***314***
	Fatalities	***6***	***3***	***5***	***3***	***4***	***21***	***4***
Interchange Ramps	Fatal	0	0	0	0	0	0	0
	Injury	22	23	45	19	22	131	26
	PDO	18	27	49	22	18	134	27
	Total	***40***	***50***	***94***	***41***	***40***	***265***	***53***
	Fatalities	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Total		**559**	**820**	**806**	**727**	**819**	**3,731**	**746**

PDO =Property Damage Only

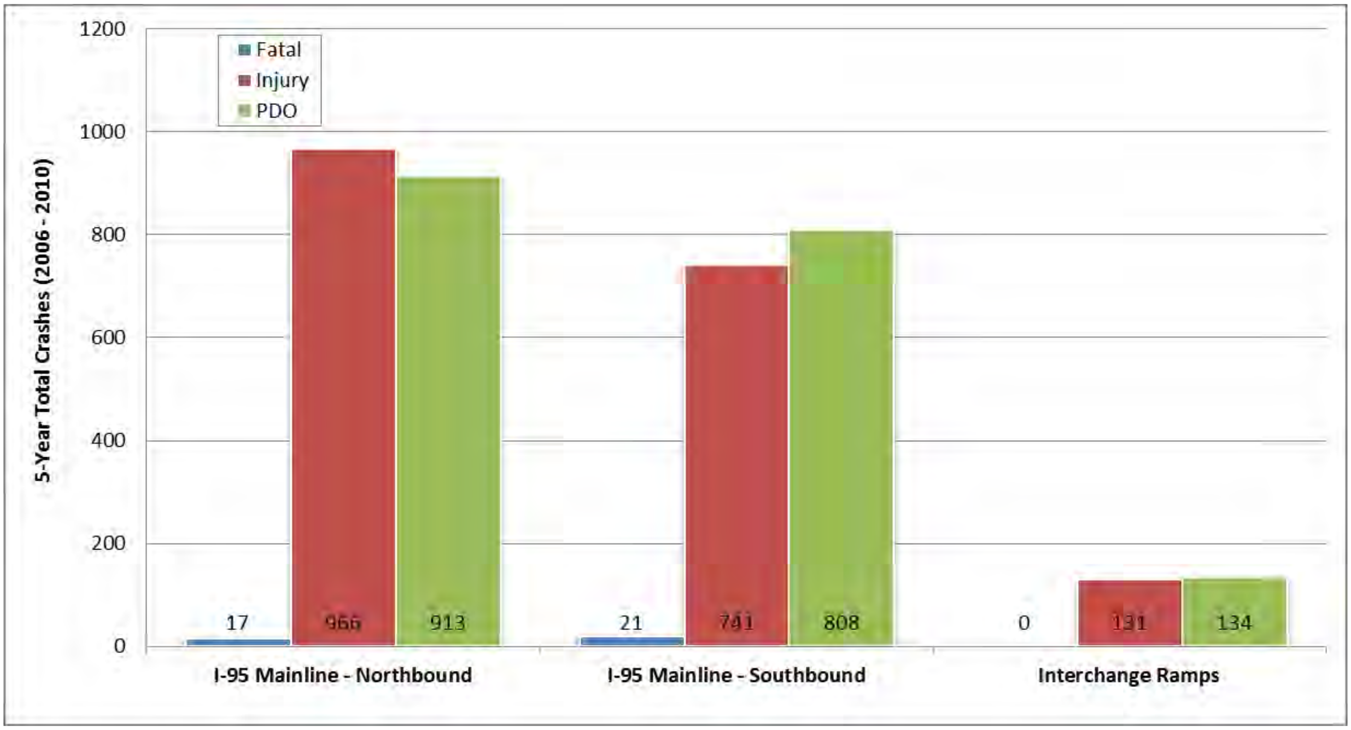


Figure 2-7
Crash Summary by Severity

As indicated in **Table 2-15** and presented in **Figure 2-7**, a total of 3,731 crashes occurred along the mainline and interchange ramps of the project corridor over the five year analysis period. The majority of the crashes (93%) occurred along the mainline. This is indicative of the relation between higher travel speeds and crash frequencies within the project corridor. Higher travel speeds increase the distance required for drivers to react to an occurrence.

2.9.2.1 Fatal Crash Analysis

A total of 38 fatal crashes occurred within the mainline of the project corridor area during the five year analysis period. None of the crashes occurred along the ramps within the analysis period. The police reports for these crashes were obtained from the FDOT and reviewed to identify specific contributing factors that may have caused or influenced these fatal crashes. The data from the police reports are summarized in **Table 2-16.** The fatal crash distribution by location is presented in **Figure 2-8**.

Based on the summary provided in **Table 2-16** the fatal crashes increased from 2007 to 2008 and remained fairly constant from 2008 to 2010. Alcohol/drug involvement accounted 32% of these fatal crashes indicating that human error was the primary factor in these crashes. The predominant crash type was rear-end (27%) followed by collisions with pedestrians (24%) and collisions with fixed objects (19%). The primary contributing causes of these crashes was alcohol/drug involvement (32%), careless driving (21%), and no improper driving/action (18%). The predominant reason for the crashes categorized with a contributing cause of no improper driving/action was due to pedestrians obstructing traffic. Improper lane change (16%) was another significant contributing cause.

Table 2-16
Fatal Crash Summary

Criteria	Fatal Crashes from Police Report	% Fatal Crashes for 5-Year period that occurred in that year
Year		
2006	6	16%
2007	6	16%
2008	9	24%
2009	8	20%
2010	9	24%
Total Fatal Crashes	**38**	**100%**
Alcohol/Drug Involvement		
Alcohol/Drugs Involved	12	32%
None	26	68%
Crash Type		
Rear-End	10	27%
Head-on	1	3%
Angle	2	5%
Sideswipe	3	7%
Collision w/ Parked Car	2	5%
Collision w/ Pedestrian	9	24%
Fixed Object	7	19%
Overturned	3	7%
Other	1	3%
Contributing Causes		
No Improper Driving/Action	7	18%
Careless Driving	8	21%
Improper Lane Change	6	16%
Alcohol/Drug Involvement	12	32%
Driving on Wrong Side	1	3%
Obstructing Traffic	4	10%
All Other	0	0%

Based on the fatal crash occurrences presented in **Figure 2-8**, two distinct clusters of fatal crash occurrences were identified at the Broward Boulevard (SR 842) and Sunrise Boulevard (SR 838) interchanges with 6 and 10 fatal crashes reported within the vicinity of these locations respectively. A review of the police report of the crashes at these locations indicates that 4 out of the 16 fatal crashes had alcohol involvement. The remaining fatal crashes were primarily due to loss of vehicle control by the drivers due to careless driving or improper lane changes resulting in the vehicles overturning or in some cases collision with fixed objects.

Therefore, it can be concluded that fatal crashes within the limits of the project appear to be random events and not related to any specific roadway feature.

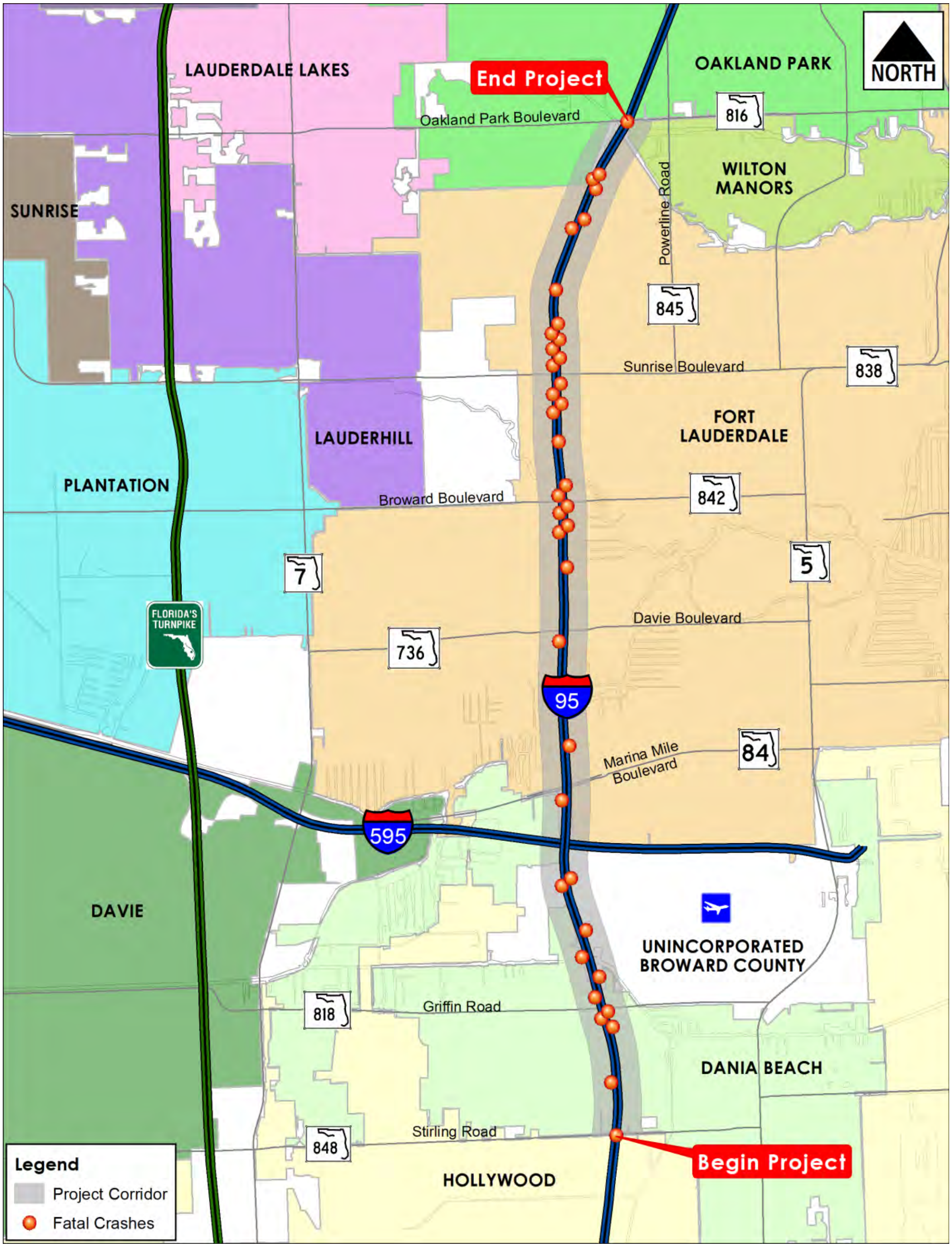


Figure 2-8
Fatal Crash Locations

2.9.3 Summary of Crash Distribution

Crashes were analyzed to identify predominant crash types along the project corridor. **Table 2-17** and **Table 2-18** summarize the crash distribution for both the mainline and interchange ramps.

Based on the summary provided in **Table 2-17** the majority of the crash occurrences along the mainline were rear-end (39%) followed by sideswipe (20%), fixed object (12%), and angle (10%). The predominant contributing causes of these crashes were documented as careless driving (23%) and improper lane change (24%). Additionally, most of the crashes occurred during the AM and PM peak periods which are times of congestion.

Table 2-17
Crash Summary for Mainline

Criteria	5-Year Total Crashes	%
Severity		
Property Damage Crash	1,721	50%
Fatal Crash	38	1%
Injury Crash	1,707	49%
Day of the Week		
Sunday	386	11%
Monday	520	15%
Tuesday	527	15%
Wednesday	517	15%
Thursday	526	15%
Friday	563	16%
Saturday	427	12%
Time of the Day		
00:00-06:00	452	13%
06:00-09:00	616	18%
09:00-11:00	262	8%
11:00-13:00	220	6%
13:00-15:00	294	8%
15:00-18:00	736	21%
18:00-24:00	886	26%
Crash Type		
Rear End	1,363	39%
Head-on	25	1%
Angle	331	10%
Sideswipe	682	20%
Collision w/ Parked Car	8	0%
Collision w/ Pedestrian	9	0%
Fixed Object	408	12%
Overturned	53	2%
Other	587	16%
Contributing Cause		
No Improper Driving / Action	425	12%
Careless Driving	773	23%
Exceed Safe/Stated Speed Limit	100	3%
Alcohol/Drugs Involvement	173	5%
Improper Lane Change	844	24%
Obstructing Traffic	30	1%
All Other	1,121	32%
Total Crashes	**3,466**	**100%**

Based on the summary provided in **Table 2-18** the majority of the crash occurrences at the interchange ramps were rear-end (37%) followed by fixed object (22%) and sideswipes (17%). The predominant contributing causes of these crashes were documented as all other (42%)

followed by careless driving (25%) and improper lane change (15%). Additionally, most of the crashes occurred during the AM and PM peak periods which are times of congestion.

Table 2-18
Crash Summary for Interchange Ramps

Criteria	5-Year Total Crashes	%
Severity		
Property Damage Crash	134	51%
Fatal Crash	0	0%
Injury Crash	131	49%
Day of the Week		
Sunday	39	15%
Monday	35	13%
Tuesday	33	12%
Wednesday	35	13%
Thursday	33	12%
Friday	40	15%
Saturday	50	19%
Time of the Day		
00:00-06:00	49	15%
06:00-09:00	41	9%
09:00-11:00	23	7%
11:00-13:00	18	8%
13:00-15:00	22	18%
15:00-18:00	49	24%
18:00-24:00	63	15%
Crash Type		
Rear End	97	37%
Head-on	2	1%
Angle	13	5%
Sideswipe	44	17%
Collision w/ Parked Car	1	0%
Collision w/ Pedestrian	0	0%
Fixed Object	57	22%
Overturned	10	4%
Other	41	14%
Contributing Cause		
No Improper Driving / Action	29	11%
Careless Driving	66	25%
Exceed Safe/Stated Speed Limit	14	5%
Alcohol/Drugs Involvement	2	1%
Improper Lane Change	40	15%
Obstructing Traffic	3	1%
All Other	111	42%
Total Crashes	**265**	**100%**

2.9.4 Segmental Crash Analysis

2.9.4.1 Crash Accumulation

The crashes along the project corridor were aggregated by locations in 0.2 mile increments utilizing the mileposts as benchmarks. The crashes were also separated by direction of travel along the project corridor. The crash accumulation by location/direction is depicted in **Figure 2-9**. Eight locations were identified as having distinct crash accumulations. Five of the 8 locations had distinct crash accumulations for both northbound and southbound traveling traffic. Two of the locations had distinct crash accumulations for only northbound traffic and one had for only southbound traffic. The following 8 locations were identified as having distinct crash accumulations from 2006 to 2010:

1. Stirling Road (SR 848) Interchange (NB & SB - MP 5.2 to MP 5.4)
2. Griffin Road (SR 818) Interchange (NB - MP 5.8 to MP 6.6)
3. SR 84 Interchange (SB - MP 8.0 to MP 8.4)
4. Davie Boulevard (SR 736) Interchange (NB – MP 9.0 to MP 9.4)
5. Broward Boulevard (SR 842) Interchange (NB & SB – MP 10.0 to MP 10.6)
6. Sunrise Boulevard (SR 838) Interchange (NB & SB – MP 11.0 to MP 11.6)
7. NW 19 Street Bridge (NB & SB - MP 12.2 to MP 12.6)
8. Oakland Park Boulevard (SR 816) Interchange (NB – MP 12.8 to MP 13.4)

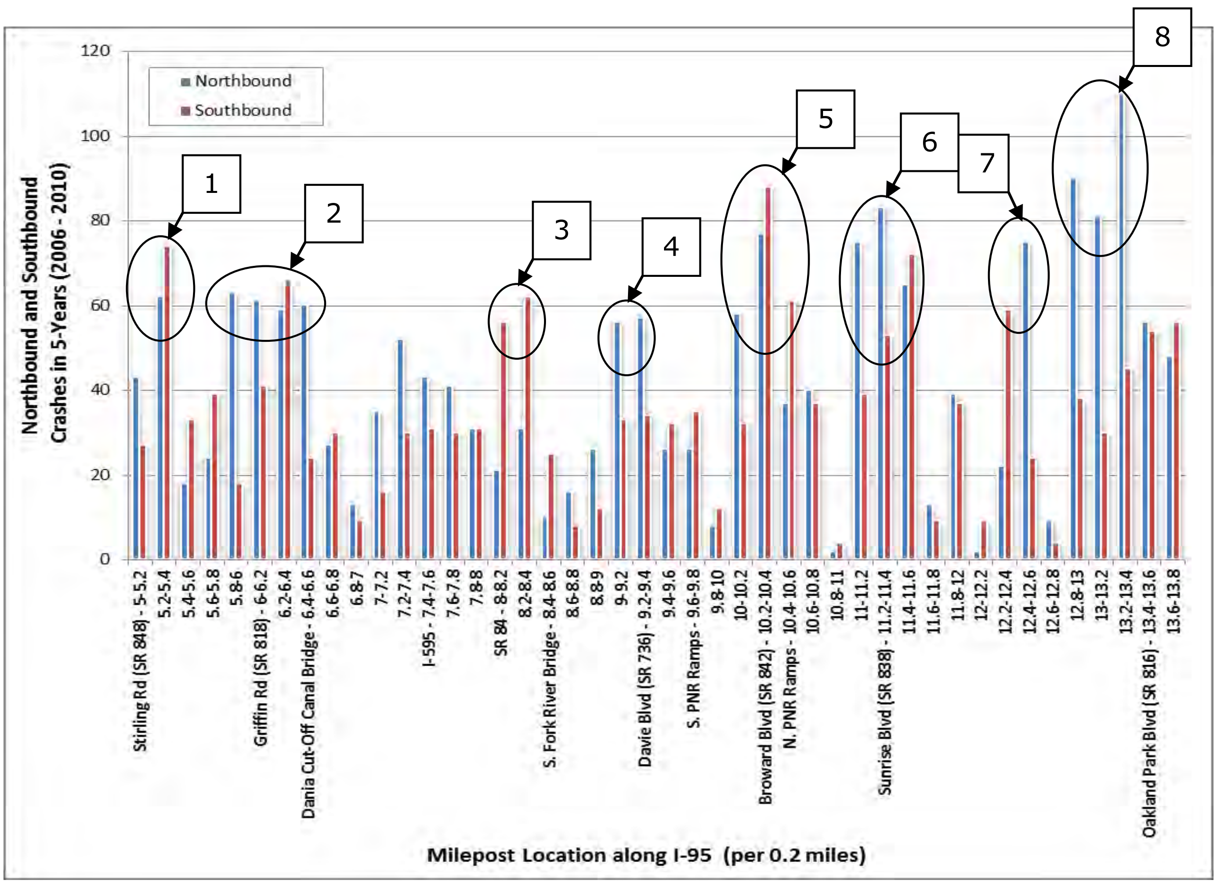


Figure 2-9
Crash Accumulation

2.9.4.2 Safety Ratio

Crash rates and safety ratios were computed for the locations identified with distinct crash accumulations along the I-95 project corridor. The evaluation process for the crash data involved the determination of the actual crash rate per million-vehicle-miles-travels (MVMT) and the comparison of these values with the critical crash rates for similar roadways. The critical crash rate and safety ratio were computed based on the average crash rate for a particular facility type and the vehicular exposure at the study location. **Table 2-19** summarizes the results of the safety ratio analysis.

Table 2-19
Crash Rates and Safety Ratios

Location	Year	ADT (vpd)	# of Crashes	Segment Length (miles)	Actual Crash Rate (Xa)	Avg. Crash Rate (Xb)	Critical Crash Rate (Xc)	Safety Ratio
Location 1 Northbound (M.P. 5.2 to 5.4)	2006	139,000	13	0.2	1.281	0.709	0.825	1.554
	2007	135,000	16	0.2	1.624	0.798	0.926	1.754
	2008	131,000	14	0.2	1.464	0.629	0.744	1.968
	2009	139,000	6	0.2	0.591	0.936	1.073	0.551
	2010	138,000	13	0.2	1.290	0.722	0.840	1.537
	AVG	**136,400**	**12**	**0.2**	**1.205**	**0.759**	**0.881**	**1.367**
Location 1 Southbound (M.P. 5.2 to 5.4)	2006	147,000	12	0.2	1.118	0.709	0.818	1.366
	2007	140,000	20	0.2	1.957	0.798	0.921	2.125
	2008	134,000	12	0.2	1.227	0.629	0.741	1.655
	2009	138,000	21	0.2	2.085	0.936	1.074	1.941
	2010	140,000	10	0.2	0.978	0.722	0.838	1.168
	AVG	**139,800**	**15**	**0.2**	**1.470**	**0.759**	**0.878**	**1.673**
Location 2 Northbound (M.P. 5.8 to 6.6)	2006	140,000	43	0.8	1.052	0.709	0.738	1.426
	2007	154,000	48	0.8	1.067	0.798	0.826	1.292
	2008	154,000	41	0.8	0.912	0.629	0.653	1.395
	2009	134,000	56	0.8	1.431	0.936	0.972	1.473
	2010	130,000	55	0.8	1.449	0.722	0.753	1.924
	AVG	**142,400**	**49**	**0.8**	**1.178**	**0.759**	**0.788**	**1.495**
Location 2 Southbound (M.P. 5.8 to 6.6)	2006	142,000	31	0.8	0.748	0.709	0.737	1.014
	2007	155,000	31	0.8	0.685	0.798	0.826	0.829
	2008	152,000	28	0.8	0.631	0.629	0.654	0.965
	2009	136,000	32	0.8	0.806	0.936	0.971	0.830
	2010	131,000	28	0.8	0.732	0.722	0.753	0.972
	AVG	**143,200**	**30**	**0.8**	**0.717**	**0.759**	**0.788**	**0.910**
Location 3 Southbound (M.P. 8.0 to 8.4)	2006	158,000	27	0.4	1.170	0.709	0.760	1.540
	2007	151,000	29	0.4	1.315	0.798	0.855	1.538
	2008	147,000	31	0.4	1.444	0.629	0.680	2.124
	2009	143,000	16	0.4	0.766	0.936	1.003	0.764
	2010	143,000	16	0.4	0.766	0.722	0.779	0.984
	AVG	**148,400**	**24**	**0.4**	**1.108**	**0.759**	**0.815**	**1.359**
Location 4 Northbound (M.P. 9.0 to 9.4)	2006	105,000	13	0.4	0.848	0.709	0.786	1.080
	2007	140,000	36	0.4	1.761	0.798	0.860	2.049
	2008	148,000	15	0.4	0.694	0.629	0.680	1.021
	2009	156,000	23	0.4	1.010	0.936	0.997	1.013
	2010	156,000	27	0.4	1.185	0.722	0.774	1.531
	AVG	**141,000**	**23**	**0.4**	**1.117**	**0.759**	**0.818**	**1.366**
Location 5 Northbound	2006	142,000	31	0.6	0.997	0.709	0.747	1.335
	2007	151,000	45	0.6	1.361	0.798	0.836	1.628

Table 2-19
Crash Rates and Safety Ratios

Location	Year	ADT (vpd)	# of Crashes	Segment Length (miles)	Actual Crash Rate (Xa)	Avg. Crash Rate (Xb)	Critical Crash Rate (Xc)	Safety Ratio
(M.P. 10.0 to 10.6)	2008	150,000	29	0.6	0.883	0.629	0.662	1.333
	2009	140,000	24	0.6	0.783	0.936	0.981	0.798
	2010	140,000	43	0.6	1.402	0.722	0.761	1.844
	AVG	**144,600**	**34**	**0.6**	**1.074**	**0.759**	**0.797**	**1.347**
Location 5 Southbound (M.P. 10.0 to 10.6)	2006	138,000	22	0.6	0.728	0.709	0.748	0.973
	2007	151,000	36	0.6	1.089	0.798	0.836	1.302
	2008	148,000	38	0.6	1.172	0.629	0.663	1.769
	2009	156,000	41	0.6	1.200	0.936	0.977	1.229
	2010	156,000	44	0.6	1.288	0.722	0.757	1.702
	AVG	**149,800**	**36**	**0.6**	**1.097**	**0.759**	**0.796**	**1.379**
Location 6 Northbound (M.P. 11.0 to 11.6)	2006	153,000	25	0.6	0.746	0.709	0.744	1.003
	2007	152,000	48	0.6	1.442	0.798	0.836	1.725
	2008	161,000	52	0.6	1.475	0.629	0.660	2.234
	2009	151,000	44	0.6	1.331	0.936	0.978	1.360
	2010	152,000	55	0.6	1.652	0.722	0.758	2.181
	AVG	**153,800**	**45**	**0.6**	**1.336**	**0.759**	**0.795**	**1.680**
Location 6 Southbound (M.P. 11.0 to 11.6)	2006	153,000	11	0.6	0.328	0.709	0.744	0.441
	2007	153,000	41	0.6	1.224	0.798	0.836	1.464
	2008	167,000	38	0.6	1.039	0.629	0.659	1.577
	2009	155,000	38	0.6	1.119	0.936	0.977	1.146
	2010	152,000	40	0.6	1.202	0.722	0.758	1.586
	AVG	**156,000**	**34**	**0.6**	**0.995**	**0.759**	**0.795**	**1.253**
Location 7 Northbound (M.P. 12.2 to 12.6)	2006	142,000	5	0.4	0.241	0.709	0.766	0.315
	2007	142,000	23	0.4	1.109	0.798	0.859	1.292
	2008	139,000	33	0.4	1.626	0.629	0.683	2.381
	2009	135,000	19	0.4	0.964	0.936	1.006	0.958
	2010	138,000	17	0.4	0.844	0.722	0.781	1.081
	AVG	**139,200**	**19**	**0.4**	**0.935**	**0.759**	**0.819**	**1.142**
Location 7 Southbound (M.P. 12.2 to 12.6)	2006	137,000	7	0.4	0.350	0.709	0.768	0.456
	2007	137,000	23	0.4	1.150	0.798	0.861	1.336
	2008	140,000	17	0.4	0.832	0.629	0.683	1.218
	2009	141,000	15	0.4	0.729	0.936	1.003	0.726
	2010	143,000	22	0.4	1.054	0.722	0.779	1.353
	AVG	**139,600**	**17**	**0.4**	**0.834**	**0.759**	**0.819**	**1.019**
Location 8 Northbound (M.P. 12.8 to 13.4)	2006	142,000	31	0.6	0.997	0.709	0.747	1.335
	2007	142,000	55	0.6	1.769	0.798	0.838	2.109
	2008	139,000	68	0.6	2.234	0.629	0.665	3.359
	2009	135,000	57	0.6	1.928	0.936	0.983	1.961
	2010	138,000	73	0.6	2.415	0.722	0.761	3.173
	AVG	**139,200**	**57**	**0.6**	**1.870**	**0.759**	**0.799**	**2.341**

The detailed safety ratio computations are provided in the Safety Analysis Report. Based on the analysis, the average safety ratios for all but one of the distinct crash accumulation locations are greater than one, therefore most of these segments present abnormally high crash occurrences. Southbound by Griffin Road (SR 818) (Location 2) does not present abnormally high crash occurrences.

The majority of the crash types at these high crash locations were rear-end followed by sideswipe crashes. The predominant contributing causes of these crashes were documented as careless driving (25%), improper lane change (18%), and "no improper driving/action" (10%). Additionally, the majority of the crashes occurred during the AM and PM peak periods. The predominant crash patterns and contributing causes are indicative of congested conditions along this segment of the I-95 corridor and the merge and diverge maneuvers from the interchange ramps.

The detailed evaluation of the predominant crash patterns and contributing causes as well as the probable causes and potential countermeasures for each of the high crash locations are documented in the Safety Analysis Report.

2.9.4.3 Safety Summary & Recommendations

The proposed capacity improvements currently planned as part of this PD&E Study will reduce the congestion along the project corridor. This will result in less tailgating and more adequate gaps during peak hours and prevent rear-end and sideswipe crashes due to congestion. In addition, the construction of the Express Lanes within the median of the I-95 project corridor will separate the long distance trips from the local trips which will also reduce traffic interactions and enhance safety. The following recommendations to enhance overall safety along the corridor should be further evaluated:

- Upgrade the existing signage along the entire corridor to the current MUTCD standards. The signage at the following locations should be evaluated in detail for short term improvements to enhance safety.
  - Additional advanced signage from I-95 southbound to SR 84 eastbound and westbound should be provided for the multiple exit ramps.
  - The exiting signage for the I-95 northbound off ramps to eastbound and westbound Oakland Park Boulevard (SR 816) is inconsistent and rather confusing and should be upgraded. It should be noted that while the project **Safety Analysis Repor**t was being developed Work Order WO-12-25-JA was issued by FDOT District 4 in order to upgrade the existing signage. Therefore, this recommendation has already been satisfied.

- Traffic operational improvements at the ramp terminals for the following interchanges should be provided to reduce potential traffic back-up onto the mainline during the peak periods.
  - Broward Boulevard (SR 842) NB & SB ramp terminals
  - Davie Boulevard (SR 736) at NB & SB ramp terminals
  - Stirling Road (SR 848) at NB & SB ramp terminals
  - Sunrise Boulevard (SR 838) at SB I-95 ramp terminal
  - Griffin Road (SR 818) at SB I-95 ramp terminal

The traffic operational improvements were evaluated as part of the Design Traffic Technical Memorandum prepared for this PD&E Study. This study will include improvements to the ramp terminals at the Stirling Road and Griffin Road interchanges as described further in **Section 6.1.2**. Other deficiencies discussed in the traffic report will be addressed as part of the I-95 Interchange Master Plan for Broward County in the Department's work program.

The area of the I-95 northbound off-ramp to Oakland Park Boulevard (SR 816) was documented with relatively high crash occurrences and one of the recommendations has already been satisfied (upgrading signage). It is recommended that before and after safety studies should be performed within three years after these initial improvements have been implemented to assess if the existing safety concerns have been mitigated. If further safety improvements are warranted within this segment, the provision of an additional auxiliary lane for the eastbound and westbound off-ramps (See MUTCD Figure 2E-34) should be evaluated. This will enhance both safety and operations within this segment of the project corridor.

2.9.5 Economic Loss

In order to calculate the economic loss per year for the crashes that took place in the last five years within the project study area, average crash cost values were used for fatal, injury and property damage crashes. The values were obtained from Chapter 23 of FDOT PPM Volume I, 2012 (see **Appendix A**). For the average crash cost of injury crashes, an arithmetic mean of the costs for severe, moderate and minor injury crashes were used.

Property Damage	=	\$6,500 per crash
Injury Crash	=	\$229,777 per crash
Fatal Crash	=	\$6.38 million per crash

Using these values, the annual economic loss was estimated as follows:

<u>Mainline Segments</u>

Annual Economic Loss = (No of fatal crashes x \$6.38 mil. + No of injury crashes x \$229,777 + No of PDO crashes x \$6,500) / no of years

= (38 x \$6.38 mil. + 1,707 x \$229,777 + 1,721 x \$6,500)/5

= \$129,171,168 (\$129 million)

<u>Interchange Ramps</u>

Annual Economic Loss = (No of fatal crashes x \$6.38 mil. + No of injury crashes x \$229,777 + No of PDO crashes x \$6,500) / no of years

= (0 x \$6.38 mil. +131 x \$229,777 + 134 x \$6,500)/5

= \$6,194,357 (\$6 million)

2.10 Lighting

The existing lighting along the corridor consists of 250-W and 400-W High Pressure Sodium (HPS) luminaires on standard aluminum poles. The pole mounting height varies from 40 to 50 ft. The existing lighting is located along the median of the project corridor from Stirling Road (SR 848) to south of the Park and Ride and from south of Sunrise Boulevard (SR 838) to Oakland Park Boulevard (SR 816). The lighting is also located on the right side of the ramps at the interchanges.

2.11 Utilities

There are 17 Utility Agency Owners (UAO) with facilities within the study area. **Table 2-20** presents the list of utility agency owners and utility contact data obtained from Sunshine State One Call of Florida (SSOCOF). All utility companies contacted have responded and provided As-builts and marked plans.

Table 2-20
Existing Utilities

	Utility Agency Owner	Facilities	Contact Person	Phone	Master Agreement
1	AT&T Florida	Telecommunications	Otis Keeve	954-723-2540	Yes
2	Broward Co. Water & Sewer	Water & Sewer	Dave O'Conner	954-831-0910	No
3	Broward Co. ITS	ITS	Dean Prieto	954-357-6408	No
4	Broward Co. Traffic	Traffic	Sharon Gross	954-847-2641	No
5	City of Dania Beach Eng. Dept.	Water & Sewer	Dominic Orlando	954-924-3740	No
6	City of Fort Lauderdale	Water & Sewer	Jon Stahl	954-828-7830	Yes
7	City of Hollywood	Water & Sewer	Ronald Bolton	954-924-2972	Yes
8	City of Oakland Park	Water & Sewer	Harris Hamid	954-561-6100	No
9	Comcast	Cable TV	Leonard Maxwell-Newbold	954-447-8405	Yes
10	FiberLight LLC	Telecommunications	Chris Pancione	954-596-2559	Yes
11	Florida Gas Transmission	Gas – Distribution	Joseph Sanchez	407-838-7171	Yes
12	FPL – Distribution	Electric	Byron Sample	954-321-2052	Yes
13	FPL - FiberNet	Telecommunications	Danny Haskett	305-552-2931	Yes
14	FPL – Transmission	Electric	George Beck	561-904-3604	Yes
15	Level3 Communications LLC	Telecommunications	Rick Miller	720-888-4968	Yes
16	Time Warner Telecom.	Telecommunications	Willie Zachary	954-761-2730	Yes
17	Verizon Business (f.k.a. MCI)	Telecommunications	John McNeil	904-355-0187	Yes

2.12 Pavement Conditions

Pavement survey data is collected, reviewed, processed, and analyzed by the Pavement Systems Evaluation Section of the FDOT State Materials Office annually. Each section of pavement is rated for cracking, ride and rutting on a 0-10 scale with 0 the worst and 10 the best. A crack rating of 6.0 or less is considered deficient. A ride rating of 6.0 or less is considered deficient for facilities with speed limits greater than 45 mph. The following ratings shown in **Table 2-21** were assigned for the major roadway segments within the project study area based on a Pavement Condition Survey (PCS) conducted for the year 2012. Based on the 2012 PCS and the rating system, the project corridor pavement conditions are acceptable.

Table 2-21
Existing Pavement Conditions

Roadway	Begin Milepost	End Milepost	Existing (2012)		Future (2017)	
			Cracking	Ride	Cracking	Ride
I-95	4.930	6.569	9.0	7.0	10.0	8.1
	6.569	8.382	10.0	7.7	10.0	8.1
	8.750	10.775	10.0	7.5	10.0	7.4
	10.775	13.742	10.0	7.6	10.0	7.4

2.13 Public Transportation

The majority of the public transportation services provided near the project vicinity are operated by Broward County Transit (BCT) and municipalities within Broward County utilizing buses and shuttles. The South Florida Regional Transportation Authority (SFRTA) also plays a significant role in Broward County public transportation through the operation of the Tri-Rail commuter rail service. Miami-Dade Transit (MDT) operates the I-95 Dade-Broward Express bus route which travels along I-95 to connect Downtown Miami/Civic Center and the Broward County Park and Ride lots. **Figure 2-10** presents the transit services provided by BCT, local municipalities, MDT, and the Tri-Rail stations near the project vicinity.

2.13.1 Broward County Transit

BCT is the primary public transportation operator in Broward County. BCT provides bus service throughout Broward County – work, schools, shopping, libraries, parks, cultural and civic activities, and other places of interest. Many municipalities within Broward County operate local circulator bus services that have been developed through partnerships with BCT via the Broward County Community Bus Program. BCT also provides links to Miami-Dade and Palm Beach counties transit systems. There are several BCT routes that provide transit services near the project as presented in **Figure 2-10**. The BCT routes that utilize the project corridor include the 595 Express buses. There are three 595 Express bus routes: one route travels between Sunrise to Downtown Fort Lauderdale and two routes travel along the project corridor to Miami-Dade County. The two routes that utilize the project corridor include the following:

- 595 Express from Sunrise to Miami/Brickell (travels along I-95 between I-595 and Downtown Miami)
- 595 Express from Sunrise/West to Miami/Civic Center (travels along I-95 between I-595 and Miami/Civic Center)

These two routes could benefit directly from the implementation of Express Lanes within the project corridor. It should be noted that BCT operates 95 express routes similar to MDT however these routes do not travel within the project corridor. These two BCT 95 Express Bus routes travel from Miramar and Pembroke Pines to Miami-Dade County.

2.13.2 Miami-Dade Transit

MDT provides bus service throughout Miami-Dade County and some locations in Broward County. For the most part, the routes are designed to intersect with Metrorail and Metromover and serve all major business, shopping, entertainment, and cultural centers, as well as major hospitals and schools. As presented in **Figure 2-10**, one MDT bus route travels along the project corridor:

- Route 95 Dade-Broward Express travels along I-95 between the Broward Boulevard (SR 842) Park and Ride lot, Sheridan Street (SR 822) Tri-Rail station, and Downtown Miami.

This route would potentially benefit directly from the implementation of Express Lanes within the project corridor.

2.13.3 South Florida Regional Transportation Authority

SFRTA is a public transportation agency similar to BCT and MDT. SFRTA operates both Tri-Rail and shuttle bus services within Miami-Dade, Broward, and Palm Beach Counties.

2.13.3.1 Tri-Rail

Tri-Rail is the tri-county commuter train service operated by SFRTA along the South Florida Rail Corridor with station stops in Miami-Dade, Broward, and Palm Beach Counties. Tri-Rail operates between Miami International Airport (MIA) to north of Palm Beach International Airport with a total of 18 stations. Morning and afternoon peak hour commuter times average 20 minutes between trains. BCT, MDT, Palm Tran, and shuttle buses connect most Tri-Rail stations with nearby downtowns and other important locations.

There are two Tri-Rail stations that are adjacent to the project corridor. These include the Fort Lauderdale/Hollywood International Airport Station at Dania Beach (by Griffin Road, SR 818) and the Fort Lauderdale Station (at the Broward Boulevard (SR 842) Park and Ride lot).

2.13.3.2 Shuttle Buses

The SFRTA shuttle buses operate a fixed-route transit services providing a circulator-like system that connects nearby communities with a Tri-Rail station. These transit services are provided at various Tri-Rail stations throughout the tri-county area. Two Tri-Rail stations are located adjacent to the project corridor and serviced by SFRTA shuttle buses including the Ft. Lauderdale/Hollywood International Airport Station and Ft. Lauderdale Station. In total there are six SFRTA shuttle bus routes that connect to these two stations. Most of these shuttle bus routes travel between the Tri-Rail stations and Downtown Fort Lauderdale and the Fort Lauderdale/Hollywood International Airport.

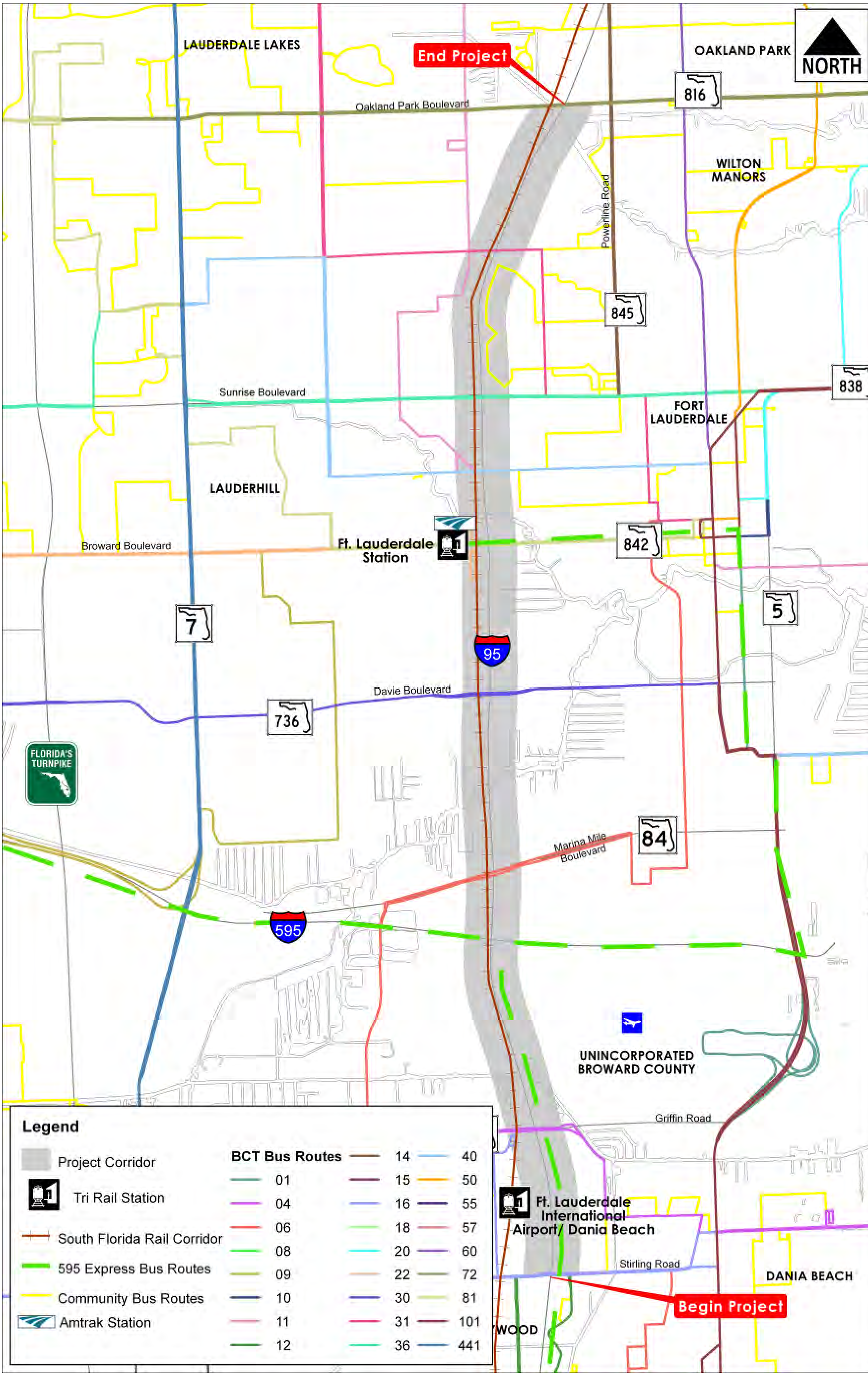


Figure 2-10
Existing Bus Routes

2.14 Railroad Facility

There are two main railroad facilities in the vicinity of the project: the South Florida Rail Corridor and the Florida East Coast Railway (FEC). Both of these railroad facilities are used to transport freight. Only the South Florida Rail Corridor transports passengers. However, the FEC Railroad has future plans to implement passenger service as well. See **Section 2.18**. **Figure 2-11** depicts the existing railroad facilities near the project vicinity.

2.14.1 South Florida Rail Corridor

The project corridor is adjacent to the South Florida Rail Corridor. This railroad is owned by FDOT and is a segment of the most extensive rail network in Florida: CSX Transportation (CSXT). This segment was acquired by FDOT from CSXT in 1988 and spans from Miami-Dade County to Palm Beach County. As part of the purchase agreement, CSXT has an exclusive perpetual freight easement. The South Florida Rail Corridor is used for transporting freight such as nonmetallic minerals, chemicals, coal, and miscellaneous shipments. The South Florida Rail Corridor is also used for passenger travel. There are two passenger rail services utilized along the South Florida Rail Corridor: Tri-Rail and Amtrak. The following is a brief description of each:

- **Tri-Rail** is operated by SFRTA and provides passenger commuter rail services between Miami-Dade County and Palm Beach County. Further details about Tri-Rail are included in **Section 2.13.3**.

- **Amtrak** operates over 21,000 route miles in 46 states, the District of Columbia and three Canadian provinces with more than 300 trains each day at speeds up to 150 mph to more than 500 destinations. The Amtrak system utilizes the South Florida Rail Corridor which is adjacent to the project corridor. One Amtrak station exists near the project corridor at the Broward Boulevard Park and Ride lot.

2.14.2 Florida East Coast Railway

The FEC is a regional railroad operating between Miami and Jacksonville. FEC maintains the second largest railroad network in the State after CSX Transportation (CSXT) and provides the only north-south mainline along the Atlantic Coast between West Palm Beach and Jacksonville. FEC provides exclusive rail service to the Ports of Palm Beach, Everglades (Fort Lauderdale), Miami, and the Kennedy Space Center. The FEC railroad corridor is used for transporting aggregates, automobiles, lumber, cement, food products, and other commodities. Currently, the All Aboard Florida initiative is underway with plans to restore passenger rail service along the FEC railway. See **Section 2.18.**

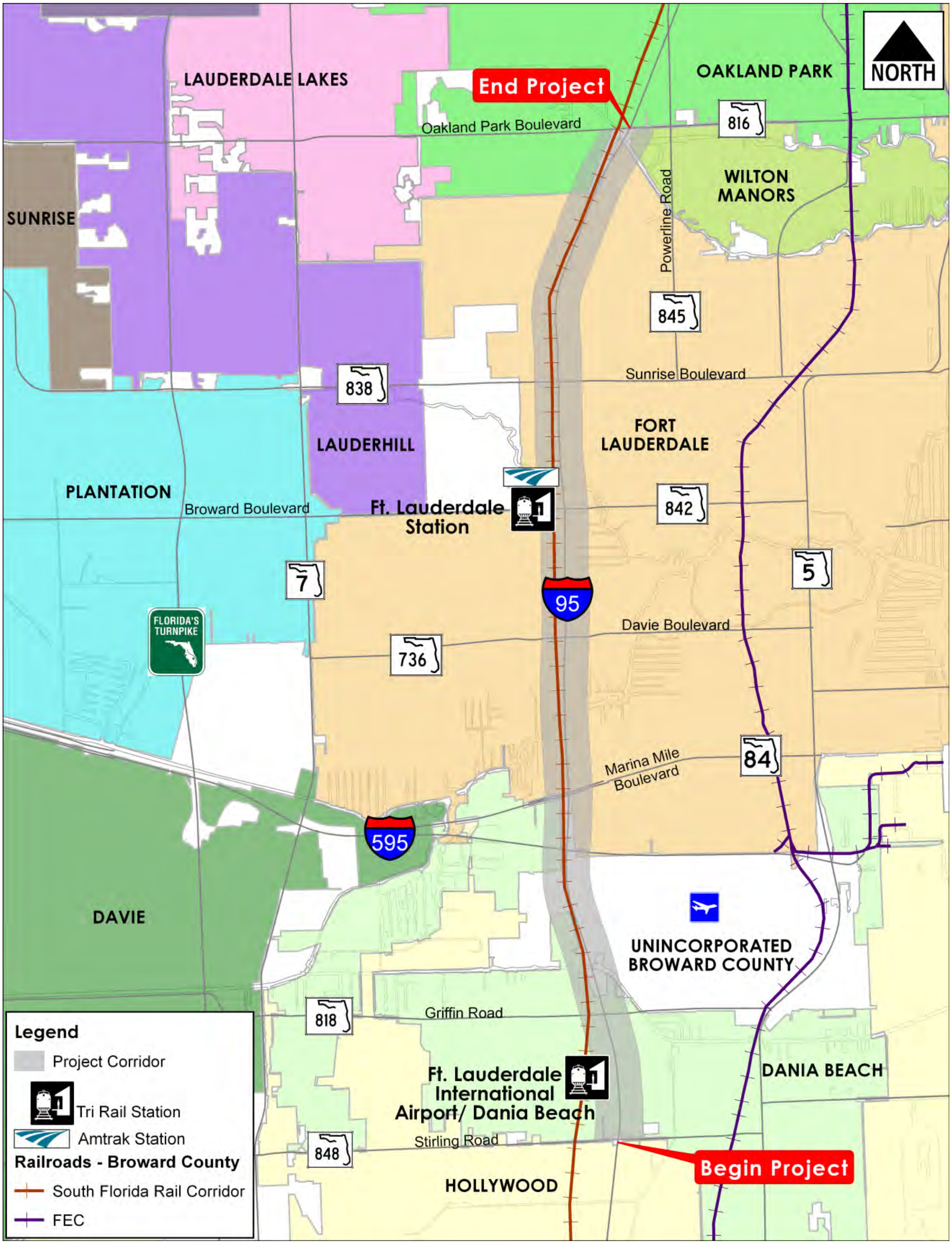


Figure 2-11
Existing Railroad Facilities

2.15 Existing Structural Characteristics

As part of this PD&E study 58 bridge structures were evaluated. These bridge structures are located along various facilities such as the I-95 mainline and ramps, I-595 mainline and ramps, arterials, and canals. **Table 2-22** summarizes the general geometry and structural information pertaining to the bridges within the project limits.

Most of these bridges were replaced/widened around the 1990s. The oldest bridge structure was built in 1969 (Bridge No.: 860213).

2.15.1 Type of Structure

The superstructure for the majority of the existing bridges utilizes steel box girders (26 out of 58). This type of superstructure was prevalent in the I-595 and SR 84 interchange. Several other bridge superstructures use a variety of prestressed AASHTO beam types (Type II, III, or IV). There are three bridges that utilize steel plate girders (Bridges Nos.: 860548, 860430, and 860431) and one bridge uses prestressed slab units (Oakland Park Boulevard (SR 816) over the C-13 Canal).

The substructure for all of the bridges consists of a combination of pier/bents with columns and 18 in. sq. concrete prestressed piles.

2.15.2 Condition of Existing Structure

The Department performs biannual inspections and evaluations of all bridge structures under its jurisdiction, as part of the National Bridge Inventory (NBI) and Structural Inventory and Appraisal Program required by the FHWA.

The latest available Bridge Load Rating Reports and Bridge Inspection Reports were obtained for all the existing bridges.

The term structurally deficient means that the bridge should undergo a series of repairs. All structurally deficient bridge structures must be repaired or replaced within six years of being designated as a structurally deficient structure. The term functionally obsolete means that the bridge section does not meet the latest road design standards. Health Index is a tool that measures the overall condition of a bridge. The lower the Health Index is the more work that is needed in order to bring the bridge to an ideal condition. Lastly, Sufficiency Rating is a tool used to determine whether a bridge that is structurally deficient or functionally obsolete should be repaired or replaced. The Sufficiency Rating considers several factors, only about half of which relate to the condition of the bridge itself. The Sufficiency Rating is not a direct reflection of the bridges' ability to carry traffic loads.

Table 2-22
Existing Bridge Characteristics

#	Location	Bridge Numbers	Minimum Vertical Clearance (ft.)	Superstructure Type	Substructure Type	Average Bridge Width (ft.)	Bridge Length (ft.)	No. of Spans	Max Span Length (ft.)	Load Rating	Sufficiency Rating	Health Index	Bridge Railings	Substructure	Restriction	Deficiency	Year Built/ Reconst.
1	I-95 over Stirling Road (SR 848)	860579 (SB)	16.25**	AASHTO Type IV	Pier/Bents 18" Prest. Piles	85.7/ 85.7	178.0	2	89.0	HS 20 (RF>1)	98.0	99.82	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
2		860580 (NB)								HS 20 (RF>1)	98.0	99.99	Meets Standard	Very Good	Open, no restriction	Not deficient	
3	I-95 over Griffin Road (SR 818)	860554 (SB)	16.10	AASHTO Type IV	Pier/Bents 18" Prest. Piles	85.7/ 85.7	180.0	2	90.0	HS 20 (RF>1)	96.0	99.54	Meets Standard	Satisfactory	Open, no restriction	Not deficient	1990
4		860555 (NB)								HS 20 (RF>1)	93.0	99.62	Meets Standard	Satisfactory	Open, no restriction	Not deficient	1989
5	I-95 over Dania Cut-off Canal	860109 (SB)	11.35 (MHW)	AASHTO Type III	Pier/Bents 18" Prest. Piles	96.54/ 96.54	180.2	3	80.2	HL 93 (IRF<1) 0.90	85.0	99.30	Meets Standard	Satisfactory	Open, no restriction	Not deficient	1965/ 1989
6		860209 (NB)								HS 20 (RF>1)	85.0	96.93	Meets Standard	Good	Open, no restriction	Not deficient	
7	SB I-95 to Griffin Road (SR 818) over Dania Cut off Canal	860546	11.65 (MHW)	AASHTO Type III	Pier/Bents 18" Prest. Piles	42.8	180.3	3	80.2	HS 20 (RF>1)	98.6	92.1	Meets Standard	Good	Open, no restriction	Not deficient	1988
8	SW 42 St over I-95/RR	860548	23.0 (RR)	Steel Plate Girders with Haunches	Pier/Bents 18" Prest. Piles	38.8	367.1	2	202.0	HS 20 (RF>1)	91.8	94.59	Meets Standard	Very Good	Open, no restriction	Functionally Obsolete	1989
9	I-595 over I-95/RR/ Ravenswood Road	860535 (WB)	16.43(NB)/ 16.66(SB)/ 23.55(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	58.8	1197.4	10	132.0	HS 20 (RF>1)	91.8	94.59	Meets Standard	Good	Open, no restriction	Not deficient	1989
10		860536 (EB)	16.43(NB)/ 17.00(SB)/ 23.55(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles					HS 20 (RF>1)	83.0	99.90	Meets Standard	Good	Open, no restriction	Not deficient	1989
11	SB I-95 to WB I-595 over Ravenswood Road	860537	24.32/ 23.01(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	42.8	695.0	5	213.0	HS 20 (RF>1)	97.8	99.46	Meets Standard	Good	Open, no restriction	Not deficient	1989
12	EB I-595 to NB I-95	860538	16.76/65.18 (RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	42.8	3749.7	22	210.8	HS 20 (RF>1)	82.6	90.84	Meets Standard	Good	Open, no restriction	Not deficient	1990
13	WB I-595 to SB I-95 over I-95	860539	16.44	Steel Box Girders	Pier/Bents 18" Prest. Piles	42.8	769.8	5	183.3	HS 20 (RF>1)	96.8	99.93	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
14	EB I-595 to SB I-95 over Ramp	860540	21.67/ 23.40 (RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	42.8	820.3	6	184.0	HS 20 (RF>1)	96.8	96.57	Meets Standard	Good	Open, no restriction	Not deficient	1988
15	NB I-95 to WB I-595 over I-95	860541	16.87/32.35 (RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	42.8	1639.0	10	206.3	HS 20 (IRF>1)	80.1	90.89	Meets Standard	Good	Open, no restriction	Not deficient	1990
16	SB I-95 to EB I-595	860542	16.50	Steel Box Girders	Pier/Bents 18" Prest. Piles	42.8	1965.0	12	203.8	HS 20 (RF>1)	84.9	92.48	Meets Standard	Good	Open, no restriction	Not deficient	1990
17	SB I-95 to Griffin Road (SR-818)	860547	N/A	Steel Box Girders	Pier/Bents 18" Prest. Piles	29.7	389.7	3	184.1	HS 20 (RF>1)	97.7	98.92	Meets Standard	Very Good	Open, no restriction	Not deficient	1988
18	EB SR 84 to SB I-95 over CSX	860521	21.14/ 23.17(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	29.8	272.0	3	120.0	HS 20 (RF>1)	97.6	99.76	Meets Standard	Very Good	Open, no restriction	Not deficient	1989
19	WB SR 84 over RR	860522	21.0/ 23.08(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	77.8	280.0	3	120.0	HS 20 (RF>1)	96.3	99.74	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
20	WB SR 84 over I-95	860523	17.22	Steel Box Girders	Pier/Bents 18" Prest. Piles	71.3	175.0	1	175.0	HS 20 (RF>1)	93.1	99.83	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
21	WB SR 84 over I-595 ramps to NB I-595	860524	16.36	Steel Box Girders	Pier/Bents 18" Prest. Piles	77.3	297.8	2	161.8	HS 20 (RF>1)	95.0	75.95	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
22	NB I-95 to EB SR 84	860525	16.36	Steel Box Girders	Pier/Bents 18" Prest. Piles	29.8	302.3	2	164.3	HS 20 (RF>1)	95.1	98.26	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
23	SB I-95 to EB SR 84	860526	N/A	Steel Box Girders	Pier/Bents 18" Prest. Piles	38.8	623.6	5	130.0	HS 20 (RF>1)	95.5	98.95	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
24	EB SR 84 to NB I-95	860527	N/A	Steel Box Girders	Pier/Bents 18" Prest. Piles	38.8	625.7	5	132.0	HS 20 (RF>1)	96.8	99.24	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
25	EB SR 84 over I-95/RR/Ramps	860528	17.96	AASHTO Type IV/ Steel Box Girders	Pier/Bents 18" Prest. Piles	68.3	1584.0	13	192.0	HS 20 (RF>1)	93.0	85.21	Meets Standard	Good	Open, no restriction	Not deficient	1988
26	I-595 to I-95 NB over South Fork New River	860213	55.1	AASHTO/PT Haunch Girders	Pier/Bents 18" Prest. Piles	47.3	1509.8	15	150.0	HS 20 (RF>1)	65.0	85.84	Substandard	Good	Open, no restriction	Not deficient	1969

Table 2-22
Existing Bridge Characteristics

#	Location	Bridge Numbers	Minimum Vertical Clearance (ft.)	Superstructure Type	Substructure Type	Average Bridge Width (ft.)	Bridge Length (ft.)	No. of Spans	Max Span Length (ft.)	Load Rating	Sufficiency Rating	Health Index	Bridge Railings	Substructure	Restriction	Deficiency	Year Built/ Reconst.
27	I-95 SB to I-595 over South Fork New River	860429	55.1	AASHTO Girders	Pier/Bents 18" Prest. Piles	54.8	1945.0	11	300.0	HS 20 (RF>1)	89.9	83.13	Meets Standard	Good	Open, no restriction	Not deficient	1987
28	I-95 over South Fork New River	860430 (SB)	55.1	Steel Plate Girders with Haunches	Pier/Bents 18" Prest. Piles	72.6	1945.0	11	300.0	HS 20 (RF>1)	85.0	97.23	Meets Standard	*	Open, no restriction	Not deficient	1988
29		860431 (NB)								HS 20 (RF>1)	91.0	82.99	Meets Standard	Good	Open, no restriction	Not deficient	1988
30	Davie Boulevard over I-95	860603	16.53	Steel Box Girders	Pier/Bents 18" Prest. Piles	141.2	979.0	8	136.0	HS 20 (RF>1)	84.7	99.98	Meets Standard	Good	Open, no restriction	Not deficient	1994
31	SB I-95 Off-ramp to Davie Boulevard	860604	N/A	Steel Box Girders	Pier/Bents 18" Prest. Piles	48.0	101.0	1	99.0	HS 20 (RF>1)	97.6	99.83	Meets Standard	Very Good	Open, no restriction	Not deficient	1993
32	NB I-95 Off-ramp to Davie Boulevard	860605	N/A	Steel Box Girders	Pier/Bents 18" Prest. Piles	52.8	101.0	1	99.0	HS 20 (RF>1)	95.2	99.83	Meets Standard	Very Good	Open, no restriction	Not deficient	1994
33	Broward Boulevard (SR 842) to SB I-95 over I-95 SB ramp to I-595	860606	16.50	Steel Box Girders	Pier/Bents 18" Prest. Piles	29.8	631.5	3	263.5	HS 20 (RF>1)	97.2	98.59	Meets Standard	Good	Open, no restriction	Not deficient	1994
34	NB I-95 to Broward Boulevard (SR 842) over I-595 ramp to NB I-95	860607	16.50	Steel Box Girders	Pier/Bents 18" Prest. Piles	29.8	527.5	3	219.5	HS 20 (RF>1)	97.5	99.48	Meets Standard	*	Open, no restriction	Not deficient	1994
35	WB Broward Boulevard (SR 842) over PNR Access	860257	23.50	AASHTO Girders	Pier/Bents 18" Prest. Piles	68.1	222.0	4	74.6	HS 20 (RF>1)	78.8	97.81	Substandard (Programmed to be replaced)	Satisfactory	Open, no restriction	Not deficient	1974
36	EB Broward Boulevard (SR 842) over PNR Access	860258	23.50	AASHTO Girders	Pier/Bents 18" Prest. Piles	68.1	222.0	3	107.6	HS 20 (RF>1)	78.8	98.46	Substandard (Programmed to be replaced)	Very Good	Open, no restriction	Not deficient	1974
37	Broward Boulevard (SR 842) over I-95	860269	16.50	AASHTO Girders	Pier/Bents 18" Prest. Piles	112.1	298.1	4	112.2	HS 20 (RF>1)	88.7	99.66	Substandard (Programmed to be replaced)	Good	Open, no restriction	Not deficient	1974
38	EB Broward Boulevard (SR 842) to NB I-95 Flyover	860598	16.69/ 29.95(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	31.1	1458.5	9	210.0	HS 20 (RF>1)	99.8	99.93	Meets Standard	Good	Open, no restriction	Not deficient	1994
39	PNR #2 to I-95 ramp over SB I-95 and SB I-95/I-595 Conn.	860600	16.02(SB)/ 16.91/ 25.59(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	31.1	1305.0	7	275.0	HS 20 (RF>1)	98.5	99.92	Meets Standard	Very Good	Open, no restriction	Not deficient	1995
40	PNR #2 to I-95 ramp over SB I-95 and SB I-95/I-595 Conn.	860638	16.91/ 25.59(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	31.1	1305.0	7	275.0	HS 20 (RF>1)	98.5	99.92	Meets Standard	Very Good	Open, no restriction	Not deficient	1995
41	I-95 to PNR #1 over I-95 SB/Broward Boulevard (SR 842)	860601	16.98/ 24.83(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	31.1	1275.0	9	250.0	HS 20 (RF>1)	97.9	78.85	Meets Standard	Good	Open, no restriction	Not deficient	1994
42	PNR to I-95 NB over I-95 SB/Broward Boulevard (SR 842)	860628	16.98/ 24.83(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	31.1	1275.0	9	250.0	HS 20 (RF>1)	97.9	79.57	Meets Standard	Very Good	Open, no restriction	Functionally Obsolete	1994
43	SB I-95 to Broward Boulevard (SR 842) over North Fork New River	860260	6.89' ABOVE MHW	AASHTO Type II/ III	Pier/Bents 18"/20" Prest. Piles	48.3	155.0	3	65.0	HS 20 (RF>1)	96.7	88.96	Meets Standard	Very Good	Open, no restriction	Not deficient	1974/ 1994
44	I-95 over North Fork New River	860270 (SB)	7.55 Above MHW	AASHTO Type III	Pier/Bents 18"/20" Prest. Piles	89.2	207.0	5	69.0	HS 20 (RF>1)	85.0	86.85	Meets Standard	Good	Open, no restriction	Not deficient	1994
45		860271 (NB)	6.35 Above MHW	AASHTO Type II/ III		85.1	250.0	3	70.0	HS 20 (RF>1)	78.6	99.32	Meets Standard	Good	Open, no restriction	Not deficient	
46	Broward Boulevard (SR 842) to I-95 over North Fork New River	860602	7.29' ABOVE MHW	AASHTO Type III	Pile Bents/18" Prest. Piles	44.1	232.0	3	77.3	HS 20 (RF>1)	99.9	99.71	Meets Standard	Good	Open, no restriction	Not deficient	1993

Table 2-22
Existing Bridge Characteristics

#	Location	Bridge Numbers	Minimum Vertical Clearance (ft.)	Superstructure Type	Substructure Type	Average Bridge Width (ft.)	Bridge Length (ft.)	No. of Spans	Max Span Length (ft.)	Load Rating	Sufficiency Rating	Health Index	Bridge Railings	Substructure	Restriction	Deficiency	Year Built/ Reconst.
47	I-95 over NW 6 St	860272 (SB)	16.35	AASHTO Type II/ IV	Pier/Bents 18" Prest. Piles	97.08/ 109.08	158.6	3	83.1	HS 20 (IRF<1) 0.952	85.1	98.41	Meets Standard	Good	Open, no restriction	Not deficient	1994
48		860273 (NB)								HS 20 (IRF<1) 0.952	85.1	99.60	Meets Standard	Good	Open, no restriction	Not deficient	
49	Sunrise Boulevard (SR 838) over I-95	860126	16.41	AASHTO Girders	Pile Bents/18" Prest. Piles	141.4	531.1	8	99.6	HL 93 (IRF<1)	85.7	99.46	Meets Standard	Very Good	Open, no restriction	Not deficient	1974/ 1991
50	Sunrise Boulevard (SR 838) to I-95 SB	860263	N/A	AASHTO Girders	Piers/Bents/18" Prest. Piles	39.3	303.0	6	69.0	HS 20 (RF>1)	99.4	98.97	Meets Standard	Very Good	Open, no restriction	Not deficient	1974/ 1990
51	I-95 SB to Sunrise Boulevard (SR 838)	860264	N/A	AASHTO Girders	Piers/Bents/18" Prest. Piles	39.3	258.0	5	71.0	HS 20 (RF>1)	81.7	98.59	Meets Standard	Very Good	Open, no restriction	Functionally Obsolete	1975
52	I-95 over NW 19 St	860115	14.78	AASHTO Type II/ III	Pier/Bents 18" Prest. Piles	94.61/ 94.61	191.6	3	111.6	HS 20 (IRF<1) 0.833	87.2	99.16	Meets Standard	Good	Open, no restriction	Not deficient	1972/ 1990
53		860215								HS 20 (IRF<1) 0.833	88.2	99.15	Meets Standard	Good	Open, no restriction	Not deficient	
54	I-95 over C-13 Canal	860116	6' Above MHW	AASHTO Type II	Pier/Bents 18" Prest. Piles	94.61/ 94.61	109.0	3	36.3	HS 20 (RF>1)	87.7	95.50	Meets Standard	Good	Open, no restriction	Not deficient	1972/ 1990
55		860216								HS 20 (RF>1)	87.7	99.33	Meets Standard	Good	Open, no restriction	Not deficient	
56	I-95 over Oakland Park Boulevard (SR 816)	860117	15.05	AASHTO Type II/IV	Pier/Bents 18" Prest. Piles	94.61/ 94.61	253.8	4	83.3	HS 20 (RF>1)	83.0	99.96	Meets Standard	Good	Open, no restriction	Not deficient	1971/ 1990
57		860217								HS 20 (RF>1)	83.0	100.0	Meets Standard	Good	Open, no restriction	Not deficient	
58	Oakland Park Boulevard (SR 816) over C-13 Canal	860139	N/A	Prestressed Slab Units	Pile Bents/18" Prest. Piles	129.8	100.5	3	33.4	HS 20 (RF>1)	88.8	87.31	Meets Standard	Fair	Open, no restriction	Not deficient	1965/ 2004

Notes:

- NBI Bridge Condition; Deck, Superstructure & Substructure: Satisfactory to Very Good
- Load Rating RF>1 (Rating Factor greater than 1); IRF<1 (Inventory Rating Factor less than 1)
- Vertical Clearance: 1- Field Measured, 2- Previous Widening Project, 3- Existing Plans
- Vertical clearance values in red do not meet the FDOT PPM or AASHTO recommended minimum vertical clearance and are being impacted by the proposed improvements. A design variation is being requested for these values.
- * Information not available
- **The bridges over Stirling Road were widened as part of the I-95 Express Phase 2 project. The proposed improvements will tie into the Phase 2 construction at Stirling Road.

Definitions:

- Load Rating - indicates the live-load capacity of the bridge based on current conditions
- Sufficiency Rating - a measure used to determine whether a bridge that is structurally deficient or functionally obsolete should be repaired or just replaced
- Functionally Obsolete - refers to a bridge that does not meet current roadway design standards
- Health Index - a measure used to indicate overall conditions of a bridge. A Health Index below 85 generally indicates that some repairs are needed.

The Bridge Inspection Reports identified several bridges as Functionally Obsolete (does not meet current design standards) with substandard bridge railing, shoulder widths or lane widths. The functional obsolete rating is not associated with structural capacity. One of the 58 bridges was identified as Functionally Obsolete. The existing Bridge Inspection Reports also indicated that all bridges have an acceptable sufficiency rating varying from 65 to 99.8 and health indices varying from 75.95 to 100.00.

The Bridge Load Rating indicates the reserved capacity of the bridge to carry live loads. Bridges are rated at three different stress levels, referred to as Operating Rating, Inventory Rating and Legal (Posting) Rating. A review of the Bridge Load Rating Reports and existing bridge plans using the HS-20 and HL-93 Design truck indicates that six of the existing bridges have an Inventory Rating Factor (IRF) below 1.0.

2.15.3 Horizontal Clearance

The horizontal clearance underneath the existing bridges is the lateral distance from the roadway edge of travel lane to the bridge abutment or piers. The horizontal clearance requirements for most roadside features and objects are established on providing the required clear zone. Both the FDOT PPM and AASHTO require bridge piers and abutment walls to be placed outside the clear zone unless shielded by a crash worthy barrier. Based on the FDOT PPM the required width of recoverable terrain for the project corridor from the edge of travel lane is 36 ft. for travel lanes and multilane ramps, and 24 ft. with auxiliary lanes and single lane ramps.

A field review of the project corridor indicated that most of the bridge abutment or piers are adequately protected by either guardrail or barrier wall system. However, Bridge No. 860538 (I-595 WB to I-95 NB) contains one pier that is unprotected and within the clear zone. This pier is located between the I-95 NB mainline and the I-95 NB off-ramp to SR 84. This pier is located about 30 ft. from the edge of travel lane which is less than the required 36 ft. This pier will be shielded.

2.15.4 Vertical Clearance

The primary function of vertical clearance to structures going over roadways or railroads consists of providing safe passage to tall design vehicles and rail cars beneath these structures. The FDOT PPM specifies that the highest point on the roadway below a bridge structure has to measure a minimum of 16.5 ft. to the lowest point (low member) beneath the structure. This includes provisions for a future underpass resurfacing of 6 in. over the existing pavement elevation. AASHTO requires a minimum vertical clearance of 16 ft. for structures passing over roadway including auxiliary lanes and the usable width of shoulders. Further guidance allows a minimum vertical clearance of 14 ft. in highly urbanized areas provided there is an alternate facility with the minimum 16 ft. clearance.

For bridges over railroads, the FDOT PPM specifies a minimum 23.5 ft. vertical clearance is recommended which includes allowance for 12 in. of railroad track adjustments. The South Florida Rail Corridor (SFRC) however, has a greater clearance requirement set at 24.25 ft.

With respect to the vertical clearance above water for bridges over canals, the FDOT Drainage Manual in Section 4.6 suggests a minimum 6.0 ft. clearance above the optimal water elevation to accommodate small boat traffic and 2 ft. minimum clearance over the design high water elevation.

2.15.5 Historical Significance

As part of the PD&E Study, a **Cultural Resource Assessment Survey (CRAS)** was conducted, and is summarized below. The purpose of the CRAS was to locate and evaluate archaeological and historic resources within the project Area of Potential Effect (APE) and to assess their eligibility for inclusion in the National Register of Historic Places (NRHP).

"Historic property or resource," as defined by the National Historic Preservation Act of 1966 is any "prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register of Historic Places." The term "historic structures" includes bridges, with few exceptions, that are at least fifty years of age. During the CRAS, a survey of all historic resources constructed in 1964 or earlier resulted in the identification of five historic resources within the APE: *Seaboard Air Line/CSX Railroad (8BD4649), North Woodlawn Cemetery (8BD4879), Dania Canal (8BD3221), Middle River Canal (8BD3225),* and *Griffin Road (8BD4432).* Only the railroad and cemetery are considered to be NRHP-eligible resources. No other historic-age structures (e.g., bridges) were identified during the CRAS.

In addition to the CRAS, a historic resources reconnaissance survey was performed to identify any significant historic resources located outside the established APE but directly adjacent to the current I-95 right of way. This reconnaissance survey resulted in the identification of four historic resources: *Link Trainer Building (8BD2562), Seaboard Air Line Railroad Station (8BD1452), CSXT Railroad Bridge (8BD3340),* and *Dania Canal Railroad Bridge (8BD3220)*. The *Link Trainer Building* is NRHP-listed, and the *Seaboard Air Line Railroad* Station and *CSXT Railroad Bridge* are NRHP-eligible.

The *New River CSX Railroad Bascule Bridge* carries the Seaboard Air Line/CSX Railroad over the South Fork of the New River. It runs north to south and is located immediately west of I-95. This bridge was constructed in 1926-1927 as part of the Seaboard Air Line Miami extension. This bascule bridge is 294 ft. in length. The main bascule span is approximately 74 ft. in length and 6.5 ft. in width. The bascule span is a steel single leaf overhead counterweight Scherzer rolling lift bascule. The bridge was designed by the Scherzer Rolling Lift Bridge Company and constructed by the American Bridge Company. Credited to William Scherzer, the Scherzer rolling lift bascule rolls along a curved track as it opens and closes, pulling itself out of the way of water traffic as it does so. The bridge has sustained some alterations since its construction. In 1967, the draw span electrical system was replaced, and in 1978 the approach spans were replaced. In 2005, emergency stabilization repairs were made to severely deteriorating underwater timber and concrete piers. In 2001, this bridge was determined by State Historic Preservation Office (SHPO) to be eligible for listing in the NRHP. Although the bridge was altered after this date, the stabilization repairs were found by SHPO to have no adverse effect on the bridge's eligibility. The bridge is not known to have sustained any additional alterations since those repairs were performed, and the repairs did not affect the qualities which rendered the bridge to be eligible for listing. It should also be noted that in support of a Memorandum of Agreement among the United States Coast Guard and the SHPO regarding improvements for the *New River CSX*

Railroad Bascule Bridge Project, plans are now underway to replace the historic bridge and relocate it to a nearby parcel owned by the City of Fort Lauderdale, which will be used as a city park.

The *Dania Canal Railroad Bridge* is located just to the west of I-95 where it crosses the Dania Canal. The bridge runs in a general north-south direction parallel to I-95 and has a total length of 45 ft. This simple steel girder and floorbeam type bridge represents a common design for covering small spans. The SHPO determined that this bridge was ineligible for inclusion in the NRHP in 1999. However, based on the reconnaissance survey it is recommended that this bridge be reevaluated, as it is likely contributing to a possible Seaboard Air Line/CSX linear historic district.

More detailed information on all of these resources can be found in the **Cultural Resource Assessment Survey** on file at FDOT District 4.

2.16 Existing Geotechnical Data

The existing geotechnical features along the project corridor were analyzed through field exploration, laboratory testing, and reviewing available information from the United States Department of Agriculture (USDA) and United States Geological Survey (USGS). The following section summarizes the analysis of the regional geology, near-surface soil conditions, and groundwater conditions.

2.16.1 Regional Geology

The project is located on the southern flank of the Florida Plateau, a stable, carbonate platform on which thick deposits of limestones, dolomites, and evaporates have accumulated. In this study, the upper 200 ft. of this platform is composed predominately of limestone and quartz sand. The sediments were deposited during several glacial and interglacial stages during the Pleistocene Epoch. Within the explored depths of this study, one distinct geological formation was encountered below the structural fills, muck, and sand layers. This formation is the Miami Limestone formation.

2.16.1.1 Miami Limestone

The Miami Limestone can be described as a soft tan white porous to very porous fossiliferous quartz sandy fine-grained slightly oolitic limestone. The solution channels in the limestone which may be up to 2 in. in diameter at some locations, are filled with quartz fine sand and uncemented calcareous materials. The limestone varies in both thickness and competency within the investigated area. The Miami Limestone was deposited in a shallow near-shore marine carbonate bank environment. Spherical carbonate sand grains called oolites formed and were deposited in this environment. Near shore, processes transported quartz sand into the area and reworked some of the carbonate material. Encrusting organisms called bryozoans were locally abundant and formed patches on the substrate. After sea level receded, the carbonate deposit was exposed to fresh water and the cementation process was initiated. The degree of cementation, and therefore the competency of the rock, was influenced by both the abundance and the type of calcareous material in the original deposit.

2.16.2 Broward County Soil Survey Map

The Soil Map of the Broward County Area, Florida, published by the USDA was reviewed for general near-surface soil information within the general project vicinity. This information indicates that there are 17 mapping units in the vicinity of the project. The map soil units encountered are summarized in **Table 2-23**.

Table 2-23
Existing Geotechnical Characteristics

Map Unit Symbol	Soil Name	Typical Profile
2	Arents-Urban land complex	0 to 9 in.: cobbly sand; 9 to 60 in.: sand
3	Arents, organic substratum-Urban lane complex	0 to 12 in.: gravelly sand; 12 to 38 in.: sand; 38 to 52 in.: muck; 52 to 72 in.: sand
4	Basinger fine sand	0 to 60 in.: fine sand
9	Dade fine sand	0 to 35 in.: fine sand; 35 to 39 in.: weathered bedrock
10	Duette-Urban land complex	0 to 80 in.: sand
11	Dade-Urban land complex	0 to 8 in.: gravelly sand; 8 to 35 in.: fine sand; 35 to 39 in.: weathered bedrock
15	Immokalee fine sane	0 to 72 in.: fine sand
16	Immokalee, limestone substratum-Urban land complex	0 to 58 in.: fine sand; 58 to 62 in.: weathered bedrock
17	Immokalee-Urban land complex	0 to 72 in.: fine sand
19	Margate fine sand	0 to 28 in.: fine sand; 28 to 32 in.: gravelly fine sand; 32 to 36 in.: unweathered bedrock
20	Matlasha, limestone substratum-Urban land complex	0 to 23 in.: gravelly fine sand; 23 to 48 in.: fine sand; 48 to 52 in.: unweathered bedrock
21	Okeelanta muck	0 to 40 in.: muck; 40 to 60 in.: sand
27	Plantation muck	0 to 10 in.: muck; 10 to 28 in.: fine sand; 28 to 35 in.: fine sandy loam; 35 to 39 in.: unweathered bedrock
38	Udorthents, shaped	0 to 30 in.: gravelly sand; 30 to 50 in.: sand; 50 to 54 in.: weathered bedrock
39	Udorthents-Urban lane complex	0 to 30 in.: gravelly sand; 30 to 50 in.: sand; 50 to 54 in.: weathered bedrock
40	Urban land	N/A
99	Water	100% water

According to the information provided by the USDA map, muck material is present at three areas: Map Unit Symbols 3, 21, and 27 with area of interest (AOI) of 3.8%, 3.3%, and 0.4%, respectively. The muck thickness ranges from 0.9 ft. to 3.3 ft. and was reported by the USDA maps to cover about 7.5% of the project area. Muck is an unsuitable material and should be removed in areas where roadway widening or improvement will be implemented. The details of this information are included in the **Preliminary Geotechnical Exploration** on file at FDOT District 4.

2.16.3 Groundwater Conditions

The groundwater levels in the percolation tests were measured at the time of drilling. Groundwater levels in the percolation tests typically ranged from 1.6 to 12.0 ft. In order to estimate the Seasonal High Ground Water Table (SHGWT), several sources were utilized such as the United

States Geological Survey (USGS) National Water Information System, water wells installed and monitored along the project limits, and the Broward County Water Table Map Average Wet Season. Based on this information, the recommended SHGWT was estimated as follows:

- From Stirling Road (SR 848) to I-595: 3.0 ft. (NGVD 29)
- From I-595 to Oakland Park Boulevard (SR 816): 3.5 ft. (NGVD 29)

Fluctuation in the observed groundwater levels should be expected due to seasonal climatic changes, construction activity, rainfall variations, surface water runoff and other site-specific factors such as water elevation variations at the canals. Since groundwater level variations are anticipated, design drawing and specifications should accommodate such possibilities and construction planning should be based on the assumption that variations will occur.

2.17 Landscaping / Greening Gateways

The Greening Gateways project focuses on landscaping beautification at the interchanges along I-95. The project incorporates smart landscape design principles that emphasize native plan communities with low water needs. These greening features are present at the I-95 interchanges with Broward Boulevard (SR 842), Sunrise Boulevard (SR 838), and Oakland Park Boulevard (SR 816). Modification or impacts to these greenway features will require coordination with Broward County and the local municipalities.

2.18 Transportation Plans

The transportation plans from cities along the corridor, the Broward Metropolitan Planning Organization (MPO) and FDOT District 4 Five-Year Work Program were reviewed to identify any programmed /planned projects along the project corridor and the major cross streets. Annually, the Broward MPO develops the Transportation Improvement Program (TIP) which is a comprehensive list of federal, state, and locally funded transportation projects within Broward County. The Broward MPO also develops the Long Range Transportation Plan (LRTP) which sets the framework for future transportation improvements for the next 20 years.

No projects along the roadways crossing I-95 were identified. The Broward County MPO 2035 LRTP identifies a portion of the project from I-595 to the Palm Beach County Line for implementation of two Express Lanes in each direction for year 2021-2025. The LRTP also identifies proposed transit routes on I-595 crossing I-95, such as the Central Broward Transit, and hubs and parking facilities along I-95 interchanges, such as on Broward Boulevard (SR 842) and Griffin Road (SR 818). **Table 2-24** summarizes various transportation related projects along or adjacent to the project corridor that have been identified in the Broward County 2035 LRTP and TIP.

Table 2-24 Transportation Plans			
Road Name	**Location**	**Project Description**	**Program Year**
Roadways and Highways			
I-95 (SR 9)	from Commercial Boulevard to south of Atlantic Boulevard	Add Lanes and Reconstruct	2013-2014
I-95 (SR 9)	from Stirling Road (SR 848) to the Broward/Palm Beach County Line	Add Lanes and Reconstruct	2016-2017
I-595 (SR 862)	from east of I-75 to west of I-95	Add Lanes and Reconstruct	2012-2017
I-95 (SR 9)	from north of Stirling Road (SR 848) to south of Broward Boulevard (SR 842)	PD&E/EMO Study	2013-2014
I-95 (SR 9)	from Broward Boulevard (SR 842) to north of Oakland Park Boulevard (SR 816)	PD&E/EMO Study	2013-2014
I-595 (SR 862)	from east of I-75 to west of I-95	Preliminary Engineering for Future Capacity	2012-2015
I-595 (SR 862)	from east of I-75 to west of I-95	Preliminary Engineering for Future Capacity	2012-2017
I-95 (SR 9)	from I-595 to Palm Beach County Line	4 Managed Lanes	2021-2025
SR 84	At I-95	Interchange Modification	2016-2020
Transit			
I-95 (SR 9)	Broward/I-95 Express	Intermodal Hub Capacity	2012-2014
I-95 Express/ Phase I	Bus Operations and Maintenance	Urban Corridor Improvements	2012-2014
I-95 Express/ Phase I	Bus Operations and Maintenance	Urban Corridor Improvements	2014-2015
I-95 (SR 9)	at Broward Boulevard	Gateway Hub/Parking Facility	2012-2017
I-595 (SR 862)	from Fort Lauderdale International Airport to Sawgrass Mills Mall	Central Broward Boulevard Transit	2012-2013
Broward Boulevard (SR 842)	from SR A1A to SR 7/US 441	High Capacity Transit	2012-2013
Sunrise Boulevard (SR 838)	from SR A1A to Florida's Turnpike	High Capacity Transit	2012-2013
Oakland Park Boulevard (SR 816)	from US 1 to Florida's Turnpike	High Capacity Transit	2012-2013

Table 2-24
Transportation Plans

Road Name	Location	Project Description	Program Year
ITS			
I-95 (SR 9)	from Miami Dade County Line to Sunrise Boulevard (SR 838)	ITS Communication System	2015-2016
I-95 (SR 9)	from Broward County Line to Palm Beach County Line	MOT/Enhanced HOV Operations	2012-2017
Bridges			
Broward Boulevard (SR 842)	from over I-95 to over CSX Railroad	Bridge Rehabilitation	2013-2014
I-595 (SR 862)	from eastbound I-595 ramp to northbound I-95	Bridge Rehabilitation	2013-2014
I-95 (SR 9)	at I-595/SR 862	Bridge Rehabilitation, Deck Overlay	2012-2013
Bicycle and Pedestrian			
Broward Boulevard (SR 842)	from SR 7/US 441 to I-95/SR 9	Bike Lane/Sidewalk	2014-2015
SR 84	From I-95 to Federal Highway/US 1	Bike Lane	2016-2020

In addition, the All Aboard Florida initiative plans on establishing a passenger rail service on the existing FEC Railway R/W from Miami to the Space Coast and build new tracks to connect to Orlando. The plan is also exploring the potential to extend the route to Tampa and Jacksonville. Stations are currently planned for downtown Miami, downtown Fort Lauderdale, downtown West Palm Beach, and Orlando. The rail service is intended to be privately owned and operated and running in 2014.

2.19 Ongoing Projects along I-95

South Florida is continuously improving its transportation network particularly the I-95 corridor which is an important north-south facility in South Florida. The Express Lanes proposed on I-95 from Stirling Road (SR 848) to Oakland Park Boulevard (SR 816) are intended to complement and support the following improvements presently underway to the south and north by providing continuous Express Lanes along the I-95 corridor throughout Miami-Dade, Broward, and Palm Beach Counties:

- 95 Express Lanes – Phase 2 Construction
- I-95 PD&E Study from Oakland Park Boulevard (SR 816) to Glades Road (SR 808)

- I-95 Reevaluation from Glades Road (SR 808) to Linton Boulevard (CR 782)
- I-95 Ramp Metering Feasibility Study

Figure 2-12 depicts the on-going PD&E Studies along I-95. These projects are all part of a larger plan for implementation of an Express Lanes Network (ELN) within South Florida. A multi-agency Regional Concept of Transportation Operations (RCTO) plan is being developed that lays out the framework of an ELN within South Florida. More information about these on-going projects are presented below.

2.19.1 I-95 Phase 2 Construction FM#s 422796-1 and 422796-2

The 95 Express Phase 2 will extend the existing Express Lanes north from the Golden Glades Interchange to Broward Boulevard (SR 842) by converting the existing HOV lanes to two tolled Express Lanes in each direction. Other work includes installing Intelligent Transportation System (ITS) components; modifying the Ives Dairy Road interchange; bridge widening at specific locations; and installing new noise walls at locations between Hollywood Boulevard and Taft Street. Construction began in November 2011, and will last approximately three years and cost an estimated $106 million.

2.19.2 I-95 PD&E FM#s 409359-1 and 409355-1

North of the project corridor is the I-95 PD&E study from Oakland Park Boulevard (SR 816) to Glades Road (SR 808). This PD&E study is also evaluating implementation of tolled Express Lanes. This project is approximately 13 miles in length and traverses five municipalities including Oakland Park, Fort Lauderdale, Pompano Beach, Deerfield Beach, and Boca Raton. The agency/public kick-off meeting was held on December 2011 and the project is anticipated to be completed in the summer of 2013. Coordination between both PD&E studies is ongoing in order to maintain consistency of design and harmonization of the entry/exit points of the Express Lanes.

2.19.3 I-95 Reevaluation FM# 412420-1

A previously approved PD&E study along I-95 from Glades Road (SR 808) to Linton Boulevard (CR 782) in Palm Beach County is being reevaluated in order to advance the project into construction. Reevaluations serve to insure project compliance with all applicable Federal and State laws prior to the advancement of the project to the next major production phase such as preliminary engineering, R/W acquisition, or construction advertisement. The reevaluation process also provides mechanisms to identify and update commitments made by FDOT during the project development process. Any new commitments or laws which may have come into effect since the approval of the original final environmental document are addressed in the reevaluation. The reevaluation is also being coordinated with the two PD&E studies to the south and is anticipated to be completed in the summer of 2013.

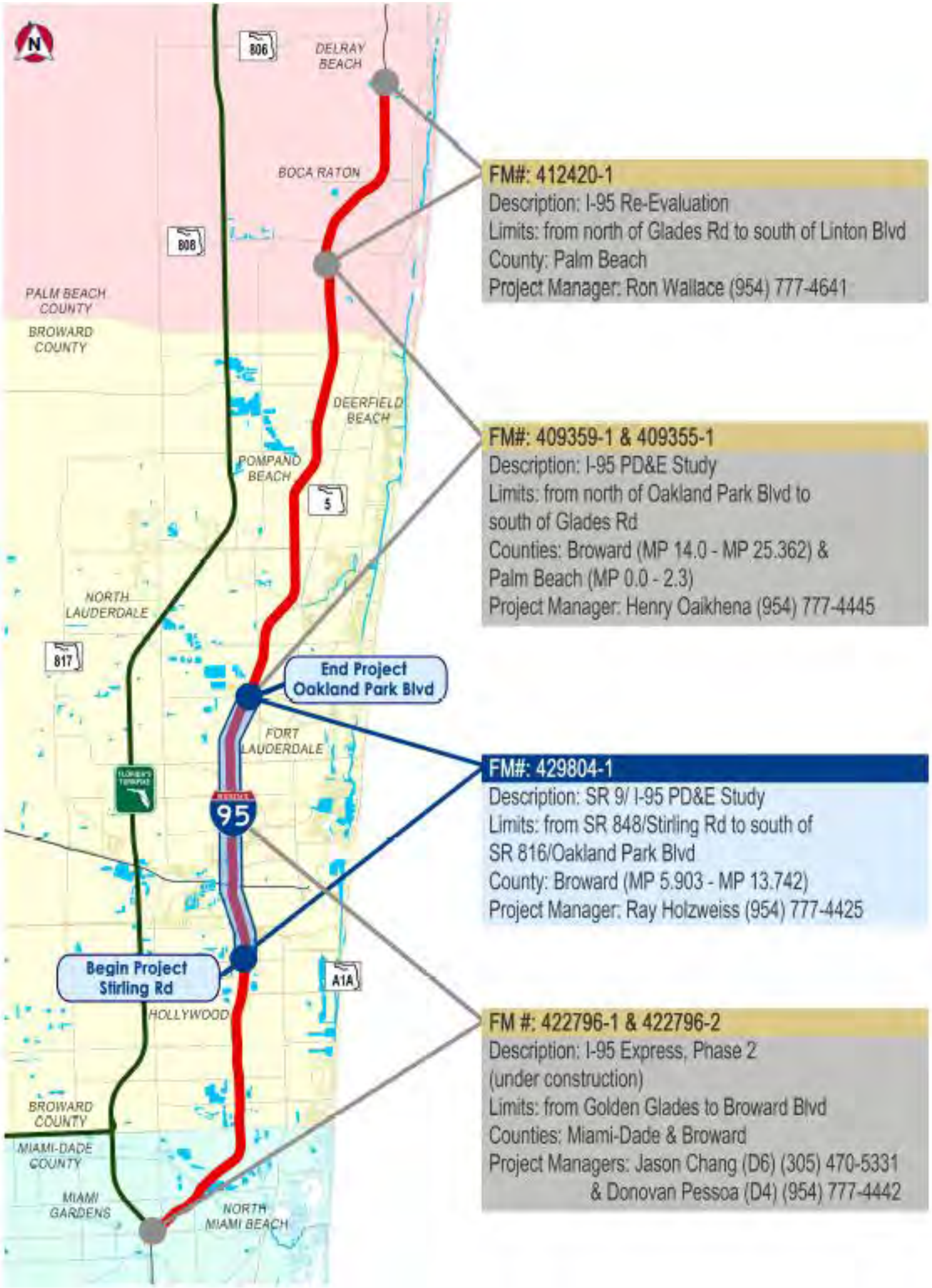


Figure 2-12
Ongoing Projects along I-95

2.19.4 I-95 Ramp Metering Feasibility Study

Ramp signals have been installed along several entrance points of I-95 from Ives Dairy Road to NW 62 Street within Miami-Dade County. The signals, which alternate from red to green lights, control the rate at which vehicles enter the highway to reduce the disruption caused by ramp traffic at the entrances. The ramp signals work based on real-time traffic conditions and are typically activated during the weekday rush-hour period to ease congestion during times of heavy expressway use. The signals increase average travel speeds and improved the overall trip reliability.

FDOT District 4 is conducting a feasibility study for the installation of ramp metering along I-95 in Broward County. The results of this study will be coordinated during the next phase, the design phase, as applicable (study is on-going).

2.19.4.1 Regional Concept for Transportation Operations

Express Lanes were successfully implemented in Miami-Dade County on I-95 as part of the 95 Express project which became operational in 2008. In order to maximize the benefits of Express Lanes, FDOT is developing projects on individual roadway corridors as part of an overall connected Express Lanes Network (ELN). However, developing an ELN is a complex initiative. As such, the multi-agency Regional Concept for Transportation Operations (RCTO) plan is being developed.

The plan will include the policies, operational guidelines and goals for how the ELN will operate regionally and how to achieve those mutually agreed upon goals. The RCTO development partners includes several transportation partners such as FHWA, FDOT District 4 and District 6, the Miami-Dade Expressway Authority (MDX), Florida's Turnpike Enterprise, MPO's, transit agencies, and other public agencies. The RCTO document is anticipated to be completed in 2013. FDOT will continue to coordinate with the RCTO as this project progresses into the design phase.

The current vision of the regional system will include Express Lanes on facilities such as I-95, I-595, I-75, SR 826/Palmetto Expressway, and could ultimately include additional roadway systems such as SR 924, SR 874, SR 836/Dolphin Expressway, and the Homestead Extension of the Florida's Turnpike (HEFT) as well as the US-1 Busway. **Figure 2-13** presents a concept of the potential ELN within South Florida.

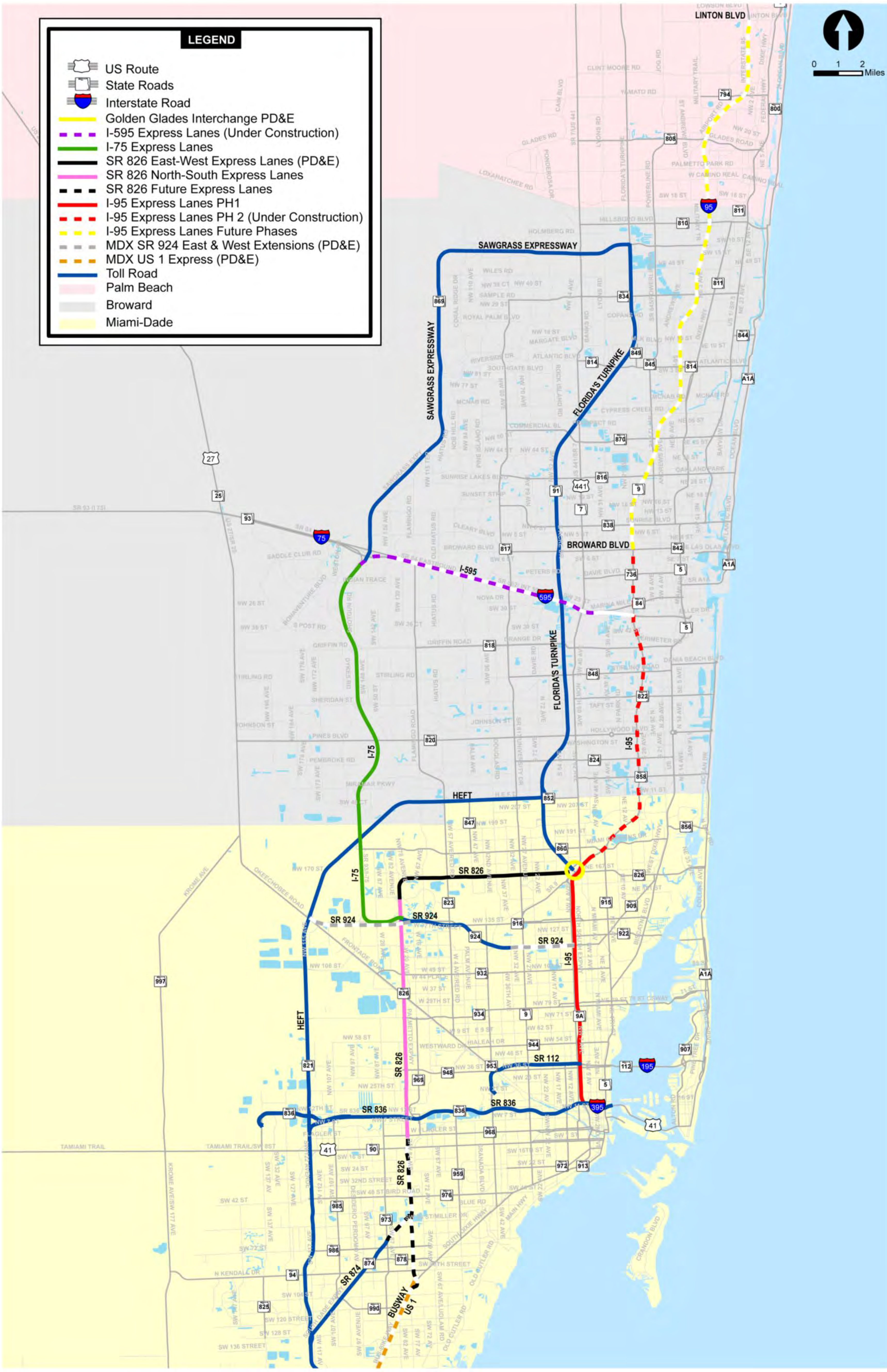


Figure 2-13
South Florida Express Lanes Network

3.0 PLANNING PHASE

As a Strategic Intermodal System (SIS) facility, the health of I-95's mobility is critical to the economic vitality of the state. I-95 is not only a vital transportation link but a critical evacuation route as well.

Preserving mobility within the corridor is of prime concern to Florida. In September 2003, FDOT finalized a master planning study for the I-95/I-595 corridors and the South Florida Rail Corridor (SFRC), which evaluated the existing deficiencies and recommended possible future improvements along these corridors.

The Locally Preferred Alternative (LPA) from the master plan study, within the PD&E study limits, consisted of the following improvements:

- Widen I-95 in Broward County to eight general purpose lanes plus two HOV lanes with auxiliary lanes as needed (I-95 within the limits of this Study from Stirling Road to Oakland Park Boulevard already has eight general purpose lanes)
- Interchange improvements

In 2007, the FDOT began a PD&E study for the segment of I-95 from Oakland Park Boulevard to Glades Road (FM #409359-1 and #409355-1) to evaluate in detail the LPA recommendations from the master plan. A year into the study, the travel demand forecasting efforts were completed and showed that adding an additional general purpose lane in each direction within the study limits would not improve the existing and future operations of the corridor. The additional lanes were not expected to accommodate the projected travel demand and growth along the corridor. Therefore, the FDOT placed the study on hold and returned to the planning phase to evaluate other possible concepts that could address the anticipated high demand and growth corridor wide.

Late in 2007, the FDOT completed the Managed Lanes Comprehensive Traffic and Revenue Study, which evaluated the potential operations of the corridor with the implementation of two tolled express lanes in each direction. The study determined that the improvements will offer potential time savings of up to 38 minutes during peak travel periods by providing continuous express lanes along I-95 throughout Miami-Dade, Broward, and Palm Beach Counties.

In 2009, the FDOT began the I-95 Corridor Planning Study, between Stirling Road (SR 848) in Broward County and Indiantown Road (SR 706) in Palm Beach County, to evaluate the feasibility of adding tolled express lanes in the median of I-95. The study was completed in January 2012 and determined that express lanes along this portion of I-95 was feasible and could be studied further during the PD&E phase to evaluate the concept as a viable alternative along the corridor.

FDOT was also tasked by the state legislature to conduct the I-95 Transportation Alternatives Study from Miami to Jacksonville. Completed in 2010, this report was required to "...include [the] identification of cost-effective measures that may be implemented to alleviate congestion on Interstate 95, facilitate emergency and security responses and foster economic development."

The results of these studies identified, recommended and prioritized the development of an integrated multimodal transportation system which is economically efficient, safe and environmentally sound.

As a result, the Florida Department of Transportation (FDOT) is undertaking several Project Development and Environment studies to investigate alternatives for improving long-term capacity needs, long-term mobility needs, travel reliability and travel options for drivers. In January 2012, FDOT initiated this PD&E study for an 8.649 mile segment of I-95, from Stirling Road (SR 848) to Oakland Park Boulevard (SR 816) in Broward County. This project was screened using FDOT's Environmental Screening Tool (EST) and an Efficient Transportation Decision Making (ETDM) Programming Screening Report was published on June 27, 2011 (ETDM # 13168) along with the Advanced Notification Package (AN).

The primary objective of this project is to design a transportation system that will offer new commuting choices and more reliable travel during congested periods.

FDOT Funding Philosophy

The following section is an excerpt from remarks prepared by Secretary Ananth Prasad:

> *"The Florida Department of Transportation, under the leadership of Governor Scott and Secretary Ananth Prasad, together with our local, state, and federal partners, has created a Florida Transportation Vision for the 21st Century. It is imperative we take every possible step to spur job creation, and get our economy back on track. Adequately funding our critical projects is vital to our success. While FDOT's current budget is about $7.9 billion, we must identify creative financing alternatives to get more projects through the production pipeline.*
>
> *To that end, Florida will be implementing a policy that all new capacity on interstates and expressways and widening and replacement of all major river crossings should be tolled where feasible or at the very least tolls should complement traditional funding in delivering the improvements and new capacity.*
>
> *With more funding, we must develop an efficient transportation system that provides choices to the user and customer. Therefore, in order to provide a world class experience for commuters, the Department will be developing a system of managed lanes in Florida."*

Feasibility of Express Lanes

The concept of providing Express Lanes (managed lanes) on the I-95 corridor reflects a growing national trend where urban areas are converting HOV lanes into Express Lanes (HOT) facilities to offer new and enhanced mobility options for motorists and transit users. This concept has been very successful in other metropolitan areas throughout the country including: SR 91 in Orange

County, California; I-15 in San Diego, California; I-10 in Houston, Texas; I-394 in Minneapolis, Minnesota; and 95 Express - Phase 1 (from I-395 / SR 836 to the Golden Glades Interchange) in Miami-Dade County, Florida.

The feasibility of Express Lanes (managed lanes) on I-95 was assessed by FDOT as part of the "FDOT Managed Lanes Comprehensive Traffic and Revenue Study" completed in 2007. Since the opening of the I-95 Express Lanes (managed lanes) Phase 1 (the two northbound lanes opened December 5, 2008 and the two southbound lanes opened January 15, 2010), commuters have experienced a number of benefits. These benefits are as follows:

1. **Improved Throughput**

From December 2008 to January 2009, there was a 9.5% increase in average weekday traffic volume throughput and a 15.7% increase during the PM peak period (4pm to 7pm). The Express Lanes (managed lanes) serviced 589,802 vehicle trips in January 2009, with an average weekday traffic volume of 21,570 vehicle trips and an average PM peak period traffic volume of 6,711 vehicle trips. Accordingly, at the end of April 2010, the I-95 Express Lanes (managed lanes) serviced 1,433,955 vehicle trips, bringing the total since opening (December 2008) to approximately 13.3 million vehicle trips.

A shift in travel modes has also occurred as a result of the Express Lanes (managed lanes). Ridership on the 95 Express bus route increased 33.5% between June 2007 and June 2009, indicating increased transit rider satisfaction. Trip-reducing carpool formations additionally increased. Currently, the Express Lanes (managed lanes) accommodate approximately 100 registered bus trips per day and a total of 8,261 registered vehicles (i.e., carpool and vanpool sign-ups). The total revenue collected to April 2010 from the Express Lanes (managed lanes) system is approximately $9.64 million, with tolls ranging from $0.25 to $6.00. This information is from a 95 Express presentation in June 2010 using results from District 6 95 Express operations reports.

2. **Improved Travel Speeds**

As of January 2010, customers choosing the Express Lanes (managed lanes) have significantly increased their travel speed during peak periods from 20 MPH to a monthly average of 57 MPH (northbound) and 63 MPH (southbound). Drivers in the general purpose lanes (local lanes) also experienced a significant peak period increase in average travel speed from approximately 20 MPH to a monthly average of 42 MPH (northbound) and 52 MPH (southbound).

3. **Improved Travel Time Reliability**

Based on the 2009 annual data collected, the Express Lanes (managed lanes) operated above 45 MPH 99.6% of the time overall and 96.4% of the time during the PM peak period. The reliability of the Express Lanes (managed lanes) has reduced the travel time for emergency responders by 19% and, in turn, improved incident management (the lanes are closed less than 1% of the time for incidents).

3.1 Conceptual Alternatives

During the PD&E Study, a planning level analysis was conducted to evaluate conceptual typical section configurations that would serve the project's purpose and need.

A planning memorandum was developed to document the potential impacts of these conceptual typical section concepts (See **Appendix B**). The following four conceptual typical sections were developed during the initial phase of the study. All four Concepts provide two tolled Express Lanes and maintain the same number of general purpose lanes and auxiliary lanes.

3.1.1 Concept #1 – Barrier Wall Separated Express Lanes

Concept #1 provides a standard typical section with a concrete barrier wall separating the Express Lanes from the general purpose lanes. Concept #1 provides the following features:

- 12 ft. wide Express Lanes
- 12 ft. wide general purpose lanes
- 12 ft. wide auxiliary lanes
- 12 ft. wide shoulders adjacent to general purpose lanes
- 6 ft. wide left and 10 ft. wide right shoulders adjacent to Express Lanes
- Concrete barrier wall separating Express Lanes and general purpose lanes

3.1.2 Concept #2 – Standard Tubular Marker Separated Express Lanes

Concept #2 provides a standard typical section with a buffer and tubular markers separating the Express Lanes from the general purpose lanes. Concept #2 provides the following features:

- 12 ft. wide Express Lanes
- 12 ft. wide general purpose lanes
- 12 ft. wide auxiliary lanes
- 12 ft. wide shoulders adjacent to general purpose lanes
- 4 ft. buffer with tubular markers separating Express Lanes and general purpose lanes

3.1.3 Concept #3 – Standard with Reduced Typical Section

Concept #3 provides a standard typical section with a buffer and tubular markers separating the Express Lanes from the general purpose lanes where feasible. A reduced typical section is provided at locations where the standard typical section would require the reconstruction of an interchange or overpass or would have substantial impacts on the existing resources, such as the bridges and Collector-Distributor (CD) roads over the South Fork New River. Concept #3 provides the following features:

Standard Typical Section

The standard typical section occurs from Stirling Road (SR 848) to I-595 and from North of the Broward Boulevard Park and Ride Ramp to Oakland Park Boulevard (SR 816).

- 12 ft. wide Express Lanes
- 12 ft. wide general purpose lanes
- 12 ft. wide auxiliary lanes
- 12 ft. wide shoulders
- 4 ft. buffer with tubular markers separating Express Lanes and general purpose lanes

Reduced Typical Section

The reduced typical section is required from I-595 to from North of the Broward Boulevard Park and Ride Ramp.

- 11 ft. wide Express Lanes
- 11 and 12 ft. wide general purpose lanes
- 12 ft. wide auxiliary lanes
- 12 ft. wide outside shoulder
- 10 to 12 ft. wide inside shoulders
- 2 ft. buffer with tubular markers separating Express Lanes and general purpose lanes

There are also areas where the typical section must be reduced further at pinch points such as underneath existing overpasses. At these locations, a constrained typical section is provided as follows:

Constrained Typical Section

The following 7 locations along the corridor will be constrained:

- SW 42 Street
- SR 84
- South Fork New River
- Davie Boulevard (SR 736)
- Park and Ride Ramp south of Broward Boulevard (SR 842)
- North Woodlawn Cemetery
- Sunrise Boulevard (SR 838)

Typical Sections at the constrained points will feature the following:

- 11 ft. wide Express Lanes
- 11 and 12 ft. wide general purpose lanes
- 12 ft. wide auxiliary lanes
- 6 to 9 ft. wide outside shoulder

- 3 to 8 ft. wide inside shoulders
- 2 ft. buffer with tubular markers separating Express Lanes and general purpose lanes

The limits of the standard, reduced, and constrained typical are highlighted in the schematic line diagram in **Appendix B**.

3.1.4 Concept #4 – I-95 Express Lanes Phase II

Concept #4 provides a reduced typical section consistent with the 95 Express Phase II typical section currently under construction to the south and provides route continuity with the previously constructed 95 Express Phase I typical section in Miami-Dade.

Reduced Typical Section

The reduced typical section is provided for the entire limits to the study except in constrained locations shown below.

- 11 ft. wide Express Lanes
- 11 and 12 ft. wide general purpose lanes
- 12 ft. wide auxiliary lanes
- 12 ft. wide outside shoulder
- 11 to 12 ft. wide inside shoulders
- 3 ft. buffer with tubular markers separating Express Lanes and general purpose lanes

There are also areas where the typical section must be reduced further at pinch points such as underneath existing overpasses. At these locations, a constrained typical section is provided as follows:

Constrained Typical Section

The following 7 locations along the corridor will be constrained:

- SW 42 Street
- SR 84
- South Fork New River
- Davie Boulevard (SR 736)
- Park and Ride Ramp south of Broward Boulevard (SR 842)
- North Woodlawn Cemetery
- Sunrise Boulevard (SR 838)

Typical Sections at the constrained points will feature the following:

- 11 ft. wide Express Lanes
- 11 and 12 ft. wide general purpose lanes
- 12 ft. wide auxiliary lanes

- 6 to 9 ft. wide outside shoulder
- 3 to 8 ft. wide inside shoulders
- 3 ft. buffer with tubular markers separating Express Lanes and general purpose lanes

The limits of the reduced and constrained typical sections are highlighted in the schematic line diagram in **Appendix B**.

3.2 Results of Planning Level Screening Analysis

All four concepts were analyzed using the following elements: geometric evaluation of roadway template, qualitative drainage impacts, desktop environmental review of potential impacts, widening or replacement of bridges along the corridor, utility impacts, right of way acquisition and Long Range Estimate (LRE) based cost estimate. This analysis is detailed in the planning memorandum included in **Appendix B**.

After careful evaluation and analysis of each Concept considered, Concept #3 was selected as the Build Alternative to be carried forward into further analysis as part of this PD&E Study. The subsequent analyses performed during this study have resulted in some modifications to Concept #3. **Section 3.1.3** above reflects the modifications that have arisen with the continued evaluation of Concept #3 as the Build Alternative.

4.0 PROJECT DESIGN STANDARDS

4.1 Design Criteria

Several design manuals were consulted to establish the final design criteria for this PD&E Study. The design criteria are based on design parameters outlined in the current editions of the following publications:

- A Policy on Geometric Design of Highways and Streets, American Association of State Highway Transportation Officials (AASHTO)
- Computer-Aided Design and Drafting (CADD) Structures Standards and Guidelines, FDOT
- Computer-Aided Design and Drafting Roadway Standards and Guidelines, FDOT
- Design Standards, FDOT
- Drainage Manual, FDOT
- Flexible Pavement Design Manual for New Construction and Pavement Rehabilitation, FDOT
- Pavement Type Selection Manual, FDOT
- Guide for Selecting, Locating and Designing Traffic Barriers, AASHTO
- Highway Capacity Manual, Transportation Research Board
- Highway Safety Manual, Transportation Research Board
- Manual of Uniform Minimum Standards for Design, Construction and Maintenance of Streets and Highways, FDOT
- Manual of Uniform Traffic Control Devices (MUTCD), FHWA
- Project Development and Environment Manual, FDOT
- Project Traffic Forecasting Handbook, FDOT
- Roadside Design Guide, AASHTO
- Roadway Plans Preparation Manual, FDOT
- Standard Drawings, Structures Design Office, FDOT
- Standard Specifications for Road and Bridge Construction, FDOT
- Structures Manual Volumes 1-9, FDOT
- The Interchange Handbook, FDOT
- Utility Accommodation Manual, FDOT

4.1.1 Freeway Design Criteria

Table 4-1
Design Criteria for Freeways

Design Elements	Criteria	Source
Functional Classification	Urban Principal Arterial - Interstate	FDOT Straight Line Diagram
Access Classification	Class 1 (Area Type 1)	PPM I, Table 1.8.1
Interchange Spacing	1 mile (Area Type 1)	PPM I, Table 1.8.1
Number of Lanes	Existing General Purpose & two Express Lanes	-
Design Vehicle	WB-62FL	PPM I, Section 1.12
Design Speed/Posted Speed	65 mph	PPM I, Table 1.9.2
Lane Widths	12 ft.	PPM I, Table 2.1.1
Outside / Right Shoulder Width	12 ft. (10 ft. paved)	PPM I Table 2.3.1
Inside / Left Shoulder Width	12 ft. (10 ft. paved)	
Bridge Width	Travel Lanes + 12 ft. Shoulders	PPM I Fig 2.0.1
Structural Capacity	HL-93 Design Load	AASHTO LRFD 2010
Vertical Clearance		
Roadway over Roadway	16.5 ft.	PPM I Table 2.10.1
Roadway Over Railroad	23.5 ft.	PPM I Table 2.10.1
Roadway Over Canal	2 ft. Min between Design Flood Stage and Bridge Low Member Elevation & 6 ft. above Normal High Elevation or control elevation	Drainage Manual Sec 4.6.1
Grades		
Maximum	3%	PPM I Table 2.6.1
Cross Slopes		
Travel Lanes	Inside lane(s) sloped towards the median at 0.02 when more than 3 lanes; Remaining lanes sloped towards the outside at 0.02 for first two lanes and at 0.03 thereafter	PPM I Fig 2.1.1
Outside / Right Shoulder Width	6%	PPM I Table 2.3.1
Inside / Left Shoulder Width	5% for 3-lanes or less 6% for 4-lanes or more	
Bridge Deck	2% in each direction with no break in slope	PPM I Section 2.1.5
Maximum algebraic difference between adjacent through lanes	4%	PPM I Figure 2.1.1
Maximum algebraic difference at turning road terminals	6% for Design Speed less than 35 mph 5% for Design Speed 35 mph or more	PPM I Table 2.1.4
Maximum Shoulder Cross Slope Break	7%	PPM I Figure 2.3.1

Table 4-1
Design Criteria for Freeways

Design Elements	Criteria	Source
Superelevation		
Maximum Superelevation Rate	emax = 10%	PPM I Table 2.9.1
Superelevation Transition Rate	1:180 for 6 lanes 1:170 for 8 lanes	PPM I Table 2.9.3
Superelevation Ratio	20:80 preferred 50:50 minimum	PPM I Section 2.9 Standard Index 510
Horizontal Alignment		
Maximum deflection without curve	0° 45' 00"	PPM I Table 2.8.1a
Minimum Length of Horizontal Curves	15V min = 900 ft. 30V preferred = 1800 ft.	PPM I Table 2.8.2a
Maximum curvature	3°00'	PPM I Table 2.8.3
Auxiliary lane length	Min 2500 ft. in advance of the exit or after entry	AASHTO 2011 Exhibit 10-53
Vertical Alignment		
Maximum Change in Grade without Curve	0.30	PPM I Table 2.6.2
Minimum Length of Crest Curve	Open Highway: L=KA but not < 1000 ft. Interchange: L=KA but not < 1800 ft.	PPM I Table 2.8.5
Minimum Length of Sag Curve	L=KA but not <800 ft.	PPM I Table 2.8.6
Minimum Crest K-Value	401	PPM I Table 2.8.5
Minimum Sag K-Value	181	PPM I Table 2.8.6
Stopping Sight Distance	730 ft. + adjustments	PPM I Table 2.7.1
Recoverable Terrain	36 ft. for travel lanes 24 ft. auxiliary lanes	PPM I, Table 2.11.11
Horizontal Clearance		
Bridge Piers	Outside Clear Zone	PPM I Table 2.11.6
Above ground fixed objects (e.g. utility poles, ITS poles and other obstacles)	Outside Clear Zone	PPM I Table 2.11.3 PPM I Table 2.11.9 PPM I Table 2.11.10
Light Poles	20 ft. from travel lanes 14 ft. from auxiliary lanes 4 ft. minimum behind guardrail	PPM I Table 2.11.2
Drop-off and Canal Hazards	60 ft. from travel lanes (≥50 mph)	PPM I Table 2.11.8
Median Width	26 ft. with Barrier wall	PPM I Table 2.2.1
Border Width	94 ft.	PPM I Table 2.5.3
Roadway Base Clearance	3.0 ft. above SHGW Elev.	PPM I Table 2.6.3
Roadside Slopes		
Front Slope	1:6 for fills <5 ft.; 1:6 to edge of Clear	PPM I, Table 2.4.1

Table 4-1 Design Criteria for Freeways		
Design Elements	**Criteria**	**Source**
	Zone then 1:4 for fills 5 ft.-10 ft. 1:6 to edge of Clear Zone then 1:3 for fills 10 ft.-20 ft. 1:2 (with guardrail) for fills >20 ft.	
Back Slope	1:4 or 1:3	
Transverse Slope	1:10 or Flatter	

4.1.2 Ramp Design Criteria

Table 4-2 Design Criteria for Ramps		
Design Elements	**Criteria**	**Source**
Design Vehicle	WB-62FL	PPM I, Figure 1.12.1
Design Speed/Posted Speed		
Flyover Ramps	40 mph / 65 mph	AASHTO 2011 Table 10-1
Connector Ramps	30 mph / 50 mph	
Loop and Other ramps	25 mph / 30 mph	
Lane Widths		
One-Lane Ramps	15 ft.	PPM I, Table 2.1.3
Two-Lane Ramps	24 ft. (12 ft. each)	
Shoulder Width		
Outside / Right Shoulder Width	One-Lane Ramps: 6 ft. (4 ft. paved) – Interstates and Non-interstates; Two-Lane Ramps: 12 ft. (10 ft. paved) – Interstates; 10 ft. (8 ft. paved) – Non-interstates	PPM I Table 2.3.1
Inside / Left Shoulder Width	6 ft. (2 ft. paved) – One-Lane Ramps 8 ft. (4 ft. paved) – Two-Lane Ramps	
Bridge Width		
One-Lane Ramps	Travel Lanes + 6 ft. Shoulders	PPM I, Figure 2.0.1
Multi-Lane Ramps	Travel Lanes + 10 ft. Outside and 6 ft. Inside Shoulders	
Structural Capacity	HL-93 Design Load	AASHTO LRFD 2010
Vertical Clearance		
Ramp over Roadway	16.5 ft.	PPM Table 2.10.1
Ramp Over Railroad	23.5 ft.	PPM Table 2.10.1
Ramp Over Canal	2 ft. Minimum between Design Flood Stage and Bridge Low Member Elevation & 6 ft. above Normal High Elevation or control elevation	Drainage Manual Sec 4.6.1

Table 4-2 Design Criteria for Ramps		
Design Elements	**Criteria**	**Source**
Grades		
Maximum	5% - Flyover and Connector Ramps; 5% - 7% - Other Ramps	PPM Table 2.6.1
Cross Slopes		
Travel Lanes	2% Minimum, varies for superelevated segments	PPM I Figure 2.1.1
Outside / Right Shoulder Width	6%	PPM I Table 2.3.1
Inside / Left Shoulder Width	5%	
Maximum Shoulder Cross Slope Break	7%	PPM I Figure 2.3.1
Superelevation (e)		
Maximum Superelevation Rate	e-max = 10%	PPM I Table 2.9.1
Superelevation Transition Rate	1:200 – Flyover and Connector Ramps 1:100 – Loop and Other Ramps	PPM I Table 2.9.3 PPM I Table 2.9.4
Superelevation Ratio	20:80 preferred 50:50 minimum	PPM I Section 2.9 Standard Index 510
Horizontal Alignment		
Minimum Length of Horizontal Curves	15V min = 750 ft.- Flyover Ramps 15V min = 600 ft.- Connector Ramps 15V min = 450 ft. - Loop and Other Ramps	PPM I Table 2.8.2a
Maximum deflection without curve	0° 45' 00" (Flyover and Connector Ramps), N/A (Loop and Other Ramps)	PPM I Table 2.8.1a
Maximum curvature	8°15'00" – Flyover Ramps 10°15'00" – Connector Ramps 24°45'00" – Loop and Other Ramps	PPM I Table 2.8.3
Exit Ramp Taper Angle	4°±	Design Standards Index 525
Ramp Entrance Taper Length	1:50	Design Standards Index 525
Lane Drop Taper	1:50 min., 1:70 Desirable	AASHTO 2011 Section 10.9.5
Ramp Terminal Spacing		
Entrance - Entrance or Exit - Exit	1000 ft. for freeways 800 ft. for C-D Road system	AASHTO 2011 Figure 10-68
Exit - Entrance	500 ft. for freeways 400 ft. for C-D Road system	
Turning Roadways	800 ft. for system interchange 600 ft. for service interchange	
Entrance - Exit	2000 ft. for system to service – freeways 1600 ft. for service to service – freeways 1600 ft. for system to service – C-D Road 1000 ft. for service to service – C-D Road	
Vertical Alignment		

Table 4-2
Design Criteria for Ramps

Design Elements	Criteria	Source
Maximum Change in Grade without Curve	0.6% - Flyover Ramps 0.7% - Connector Ramps 1.0% - Loop and Other Ramps	PPM I Table 2.6.2
Minimum Length of Crest Curve	Varies L=KA but not < 300 ft.	PPM I Table 2.8.5
Minimum Length of Sag Curve	Varies L=KA but not < 200 ft.	PPM I Table 2.8.6
Minimum Crest K-Value	136 - Flyover Ramps 98 - Connector Ramps 31 - Loop and Other Ramps	PPM I Table 2.8.5
Minimum Sag K-Value	96 - Flyover Ramps 79 – Connector Ramps 37 - Loop and Other Ramps	PPM Table 2.8.6
Stopping Sight Distance	425 ft. - Flyover Ramps 360 ft. – Connector Ramps 200 ft. - Loop and Other Ramps	PPM Table 2.7.1
Horizontal Clearance		
Bridge Piers	Outside Clear Zone	PPM Table 2.11.6
Above ground fixed objects (e.g. utility poles, ITS poles and other obstacles)	Outside Clear Zone	PPM Table 2.11.3 PPM Table 2.11.9 PPM Table 2.11.10
Light Poles	20 ft. from travel lanes 14 ft. from auxiliary lanes 4 ft. minimum behind guardrail	PPM Table 2.11.2
Drop-off and Canal Hazards	60 ft. from travel lanes (≥50 mph) 50 ft. from travel lanes (< 50 mph)	PPM Table 2.11.8
Border Width	94 ft.	PPM I Table 2.5.3
Recoverable Terrain	10 ft. - One-Lane Ramps (<45 mph) 14 ft. - One-Lane Ramps (45 mph and 50 mph) 18 ft. –Two-Lane Ramps (<45 mph) 24 ft. –Two-Lane Ramps (45 mph and 50 mph)	PPM Table 2.11.11
Roadway Base Clearance		
Ramp Proper	2.0 ft. above Seasonal High Ground Water Elevation	PPM Table 2.6.3
Low Point on-ramps at Cross Roads	1.0 ft. above Seasonal High Ground Water Elevation	

4.1.3 Drainage Design Criteria

Drainage design and construction criteria for the proposed improvements will adhere to FDOT Standards and will comply with the recommended standard practices as set forth in **Table 4-3**.

Table 4-3
Drainage Design Criteria

Design Element	Criteria	Source
Design Frequency		
Storm Sewer	10-Year Design Frequency	D.M. Section 3.3
Cross Drains	50-Year Design Frequency	D.M. Section 4.3
Design Tailwater		
All Conditions	Conditions Vary with Outfall	D.M. Section 3.4
Minimum Time Of Concentration (TOC)	Minimum T.O.C. of 10 Minutes Other T.O.C Calculations to Follow NRCS TR-55	D.M. Section 3.5.1
Pipe Slopes		
Minimum	Mininimum Slope to Produce V=2.5 ft/sec Flowing Full	D.M. Section 3.6.1
Manning's "n" Coefficient		
Pipes	0.012 (all pipe sizes)	D.M. Section 3.6.4
Asphalt (rough texture)	0.016 Asphalt Pavement	S.D. Table 3-2
Pipe Size And Length		
Truck Line	18 in. Minimum Diameter	D.M. Section 3.10.1
Length Between Structure	18 in. Pipe = 300ft. 24 in. – 36 in. = 400 ft, >42 in. =500 ft	D.M. Section 3.10.1
Pipe Material		
Hydraulic Design	Reinforced Concrete Pipe	D.M. Section 6.4
Hydrologic Analysis		
Storm Drain Design	Rational Method Used	S.D. Section 2.0
Freeboard		
Storm Drain	Minimum 1 ft. Below Theoretical Gutter Elevation	S.D. Section 5.0
Retention Ponds	Minimum 1 ft. Above Peak Design Stage	T.D.M.S. Section 5.3.4.2
Permanent Pool Pond Depth		
Wet Detention	4 ft. Minimum Depth 8 ft. Maximum Depth	S.M.F. Section 3.1.1
Stormwater Management System		
Water Quality	Water quality standards, as set forth in Chapter 62-302, Florida Administrative Code.	V- IV Section 5.0
Discharge Limitations	Historic Discharges, Post <= Pre	V- IV Section 6.1

Abbreviations
D.M. FDOT Drainage Manual; March 2012
S.D. FDOT Storm Drain Handbook; January 2012
S.M.F. FDOT Stormwater Management Facility Handbook; January 2004
V-IV SFWMD Permit Information Manual Volume IV; 2012

5.0 ALTERNATIVE ALIGNMENT ANALYSIS

A No-Build and Build Alternative were investigated to meet the needs of the project. These alternatives include the No-Build, the Transportation System Management (TSM) and the Build Alternative. The Build Alternative maximizes long-term capacity needs, long-term mobility needs, travel reliability and travel options for drivers.. This also provides for the opportunity to incorporate regional express bus service.

5.1 No-Build Alternative

The No-Build Alternative assumes no proposed improvements and serves as a baseline for comparison against the other alternatives. This is consistent with the requirements of the National Environmental Policy Act (NEPA) and FHWA guidelines. The No-Build Alternative includes on-going construction projects and all funded or programmed improvements scheduled to be opened to traffic during the analysis years being considered.

The advantage of the No-Build Alternative is that it requires no expenditure of public funds for design, right of way acquisition, construction or utility relocation. In addition, there would be no direct or indirect impacts to the environment or socio-economic impacts from the project. However, the No-Build Alternative does not alleviate the chronic congestion, operational, safety and mobility issues currently experienced along I-95 during the peak hours. If no improvements are made, these conditions will continue to deteriorate. Consequently, the No-Build Alternative does not satisfy the purpose and need for this project.

5.2 Transportation Systems Management Alternative

The Transportation System Management (TSM) alternative seeks to maximize the efficiency of the current transportation system by implementing preliminary low cost strategies that could be implemented in the short term without any right of way acquisition: Addition of turn lanes, auxiliary lanes, ITS, and Active Transportation and Demand Management (ATDM) strategies etc..

Table 5-1 identifies the key attributes of each strategy, their applicability to the No-Build and Build Alternative along I-95 within the study limits, steps needed for implementation and additional thoughts as to the challenges to be considered prior to implementation.

Some of these strategies are already being utilized along the project corridor including incident detection, incident monitoring, and traveler information through the use of Dynamic Messaging Signs (DMS). The remaining strategies could maximize the efficiency of the existing facility at a low cost but they would not achieve the main purpose of the project which is to maximize long-term capacity needs, long-term mobility needs, travel reliability and travel options for drivers.

Table 5-1
Potential Transportation Systems Management Strategies

Project Strategy		Key Attributes	Applicability to Project	Implementation Steps	Challenges
1	Incident Detection	Radar-based vehicle detection with algorithms utilizing near real-time traffic data to detect anomalies. Utilization of Computer Aided Dispatch data feed.	Applicable for general purpose and express lane(s) for no-build and build alternatives	Current system in place performs incident detection and will require modification during construction	Lane count greater than 12 or distances greater than 250 feet require dual devices. System measures only vehicles but cannot determine person throughput.
2	Traveler Information	Dynamic Message Sign (DMS) messaging for incident information, estimated travel time, and express lane information. Highway Advisory Radio (HAR) messaging for major incidents. Travel condition information via telephone and web site (511).	Express Lane signing must conform to MUTCD Section 2G. General lanes' signing should comply with longitudinal and lateral spacing principles	Current system in place should be modified to provide all necessary information for the express lanes and general use lanes in either project alternative	Express lane eligibility and pricing rules are under development. Dynamic and static signing must reflect these future policies. Certain signing will be needed in the Broward Blvd. Park & Ride Lot.
3	Incident Management	Incident Management, while inclusive of many strategies, focuses on on-scene support and response agency coordination. Service patrols are the key strategy to reduce incident durations, severity and secondary crash potential.	General purpose and express lanes both require active support of service patrols	Develop new quick incident clearance policies and procedures for express lanes	Updated coordination efforts needed to address express lane access, response, scene safety and clearance issues
4	Emergency Power and Communications	Uninterruptible power systems, field generators, and power distribution systems. Emergency wireless communications systems	Modified general purpose lane and express lane devices will require conditioned power	Future design should take into account power requirements. New operations procedures could utilize existing Voice-over-IP network.	Current ducts/cabling potentially in conflict with Build alternative widening
5	Traffic Signal Optimization	Signal Priority Systems can give access from arterials for Transit and Emergency Vehicles	Field Hardware is already in place enabling this strategy. Applicable to both alternatives	Identify express bus routes, instrument the vehicles and program field equipment	Transit Signal Priority (TSP) has already been implemented successfully in Broward County

Table 5-1
Potential Transportation Systems Management Strategies

	Project Strategy	Key Attributes	Applicability to Project	Implementation Steps	Challenges
6	Congestion Pricing	Dynamic pricing of users of express lanes for demand management. This element includes open road tolling, enforcement, communications, back office and dynamic signing systems.	Pricing is applicable to both no-build and build alternatives	Concept of Operation update needed to reflect systems requirements and District 4 role in express lane operations	Algorithms and back-office coordination are needed for a modern / responsive tolling system
7	Ramp Metering	Signal control of general use lane entrance, preferably actuated based on traffic conditions system wide	Applicable to both alternatives	Additional hardware, power and communications needed. Current software platform includes ramp meter functions	This strategy is currently under study by FDOT 4
8	Variable Speed Limits	Speed limit signs providing a safe operating speed in real time	Applicable to both alternatives	An evaluation of operating speeds and crash history will indicate whether there are benefits	Existing software includes this functionality
9	Lane Use Controls	Lane use control signs over each lane indicating usage during free flow, incidents, and maintenance operations	Applicable to both alternatives	Whether implemented with the initial project or in the future, signing spacing could be designed to accommodate the typical half-mile spacing of the gantries	New software development or transfer of a package from another state would be required along with a concept of operations update
10	Hard Shoulder Running	Dynamic lane use signs over shoulders, indicating allowable use	Not applicable to this project	Lane use Control signs described above over shoulder. Shoulder pavement should be full depth	Shoulder widths are constrained and reduced to a minimum of 3 ft. in some areas
11	Addition of Turn lane at Stirling Road (SR 848) and Griffin Road (SR 818)	Improved capacity at ramp terminals	Not applicable to this project	Could be implemented as part of the D/W PD&E Project Traffic Interchange Analysis (FM's 425980-2-32-01 and 425980-02-22-01	Coordination with DIRC on the level of documentation required (IAOR or IAOR Light)

5.3 Build Alternatives

As discussed in Chapter 3, several planning level concepts were evaluated. These concepts vary on the roadway width (lanes and shoulder) and type of separation between the Express Lanes and the general purpose lanes. Concept #3 was recommended for further analysis as part of this PD&E and is presented below as Build Alternative 1.

The number of existing general purpose non-tolled lanes will not change. The proposed Express Lanes (managed lanes) will have variable pricing/tolls that fluctuate with increased congestion so that an operating speed of 50 MPH can be maintained in the Express Lanes (HOT lanes) at all times on the corridor. Transit (buses) and registered high occupancy vehicles with three or more people (HOV-3) will be able to use the Express Lanes (managed lanes) at no cost. Dual and single occupant vehicles will be allowed to enter the Express Lanes (managed lanes) by paying an all-electronic toll through the SunPass system. It should be noted that the FDOT is proposing to allocate a portion of the collected tolls to support regional express bus service (Bus Rapid Transit or BRT) operations on the corridor.

Overall, the build alternatives will consider:

- Increasing the (toll-free) occupancy requirement to HOV-3
- Converting the single HOV lane in each direction to dual Express Lanes (HOT lanes) in each direction
- Separating the Express Lanes (managed lanes) and the general purpose lanes via tubular delineators (to replace the open access to the HOV lanes now provided in the current configuration)
- Limiting the number of ingress and egress access points to the Express Lanes (managed lanes)
- Implementing regional express bus (BRT service)

5.3.1 Build Alternative 1

Build Alternative 1 consists of two tolled Express lanes, separated from the general purpose lanes by tubular markers, and maintains the same number of general purpose and auxiliary lanes.

Build Alternative 1 includes a combination of several typical section configurations: Standard Typical Section, Reduced Typical Section and Constrained Typical Section. They are as detailed in the following sections and depicted in **Figure 5-1** through **Figure 5-3**.

Standard Typical Section:
The standard typical section can be provided from Stirling Road (SR 848, M.P. 5.135) to I-595 (M.P. 7.555) and from north of the Broward Boulevard Park and Ride Ramp (M.P. 10.585) to Oakland Park Boulevard (SR 816, M.P. 13.742). It provides 12 ft. wide travel lanes, inside and outside shoulders, and a 4 ft. buffer between the Express Lanes and the general purpose lanes.

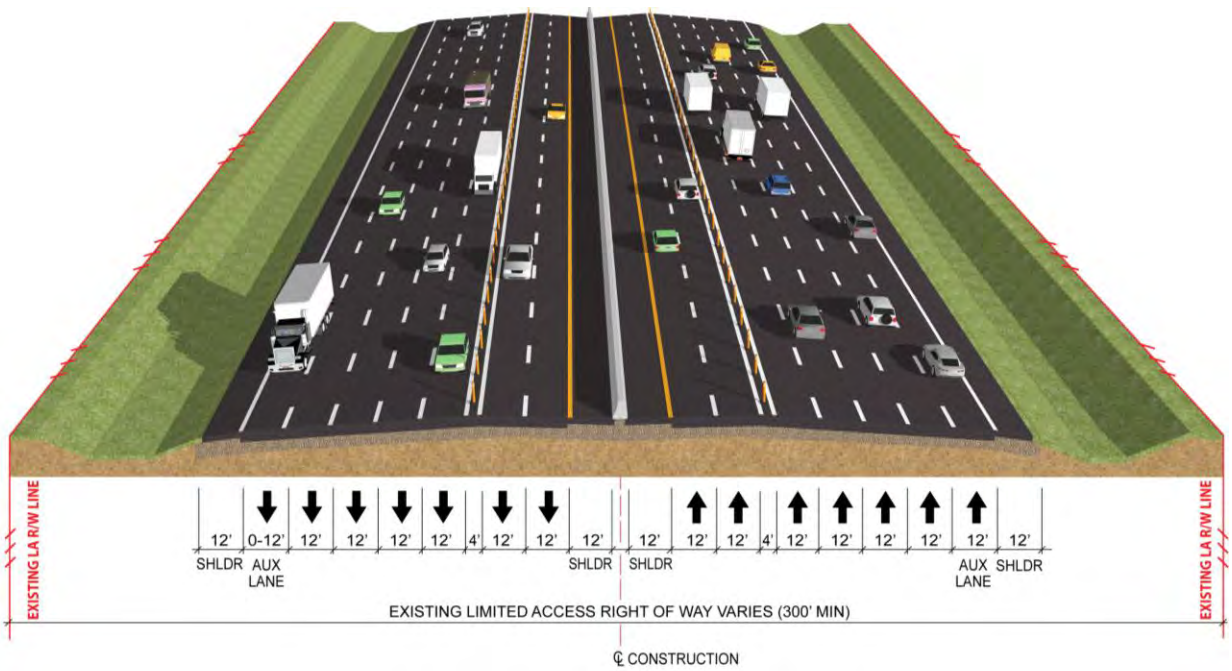


Figure 5-1 Standard Typical Section
from Stirling Road (SR 848, M.P. 5.135) to I-595 (M.P. 7.555) and from North of the Broward Boulevard Park and Ride Ramp (M.P. 10.585) to Oakland Park Boulevard (SR 816, M.P. 13.742)

Reduced Typical Section:
Two different reduced typical sections are provided between I-595 (M.P. 7.555) and north of the Broward Boulevard Park and Ride Ramp (M.P. 10.585) as depicted in **Figure 5-2** and **Figure 5-3**, where the standard typical section would require the reconstruction of interchanges or overpasses. These configurations feature 11 ft. wide Express Lanes, 12 ft. general purpose lanes and a 2 ft. buffer between the Express Lanes and general purpose lanes. The inside shoulders are 10 ft. for Reduced Typical Section 1 and 12 ft. for Reduced Typical Section 2.

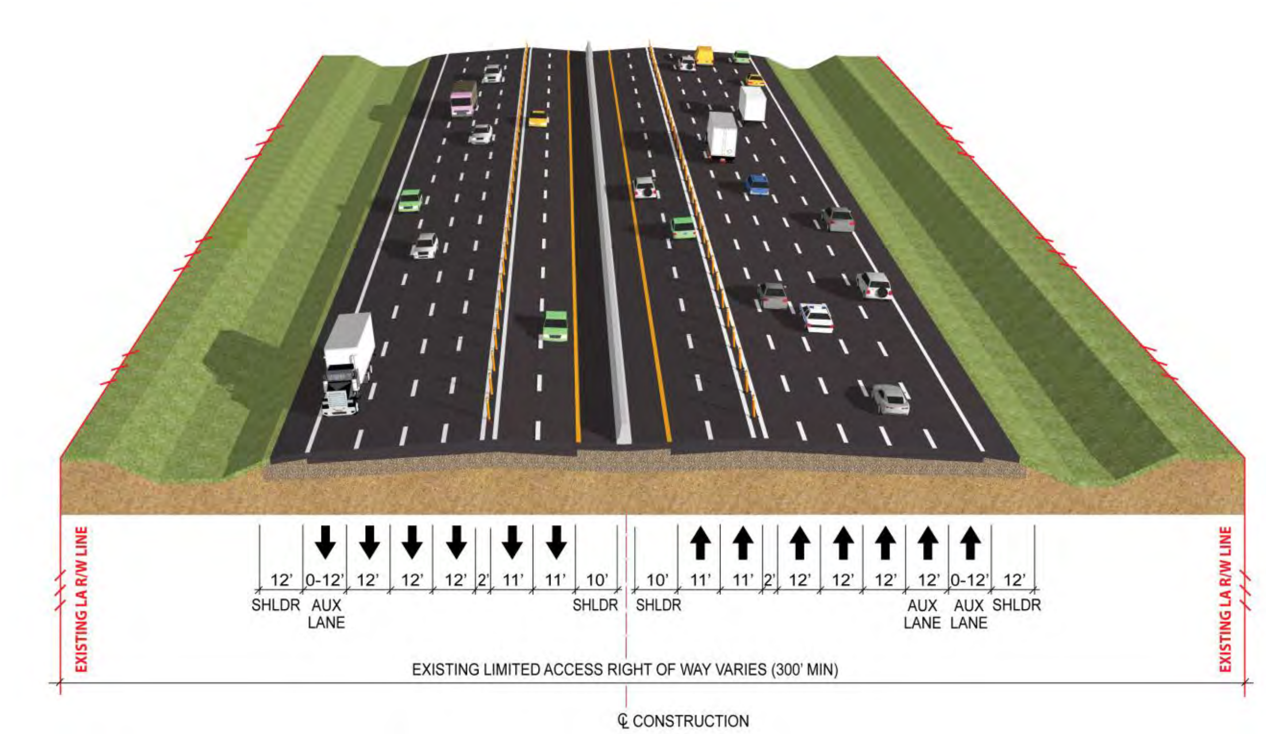


Figure 5-2 Reduced Typical Section 1
from I-595 (M.P. 7.555) to South of the Broward Boulevard Park and Ride Ramp (M.P. 9.738)

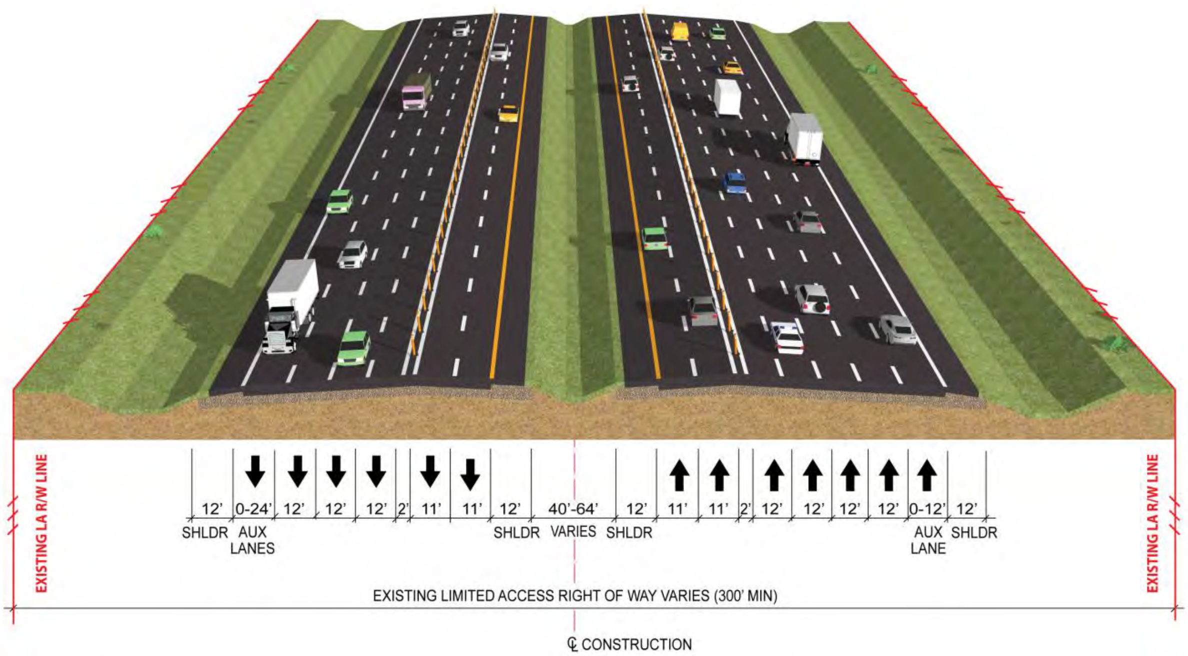


Figure 5-3 Reduced Typical Section 2
from South of the Broward Boulevard Park and Ride Ramp (M.P. 9.738) to North of the Broward Boulevard Park and Ride Ramp (M.P. 10.585)

Constrained Typical Section:
Within the corridor, there are also pinch points where a constrained typical section is required. Some of these pinch points occur underneath the bridges at SW 42 Street, SR 84, Davie Boulevard (SR 736) and Sunrise Boulevard (SR 838). Other locations include: along the northbound lanes at the Park and Ride ramp south of Broward Boulevard, along the South Fork New River bridges, and adjacent to the North Woodlawn Cemetery. The alignment for Build Alternative 1 was designed to avoid impacting these resources and the aforementioned bridges by providing a similar lane configuration as the reduced typical section plus narrower shoulders. A summary of these shoulders is presented in **Table 5-2.**

Table 5-2
Typical Sections at Constrained Locations

Location	Direction	Shoulder Width (ft.)		Auxiliary Lane (ft.)	Number of GPL	Total Width (ft.)	Length of Reduced Section (ft.)
		Outside	Inside				
SW 42 Street Underpass	SB	8	3	12	4	94	1840
	NB	8	3	12	4	94	1650
SR 84 Underpass	SB	9	8	0	3	76	8000*
	NB	9	8	0	3	76	6300**
South Fork New River Bridge	SB	8	4	0	3	72	8000*
	NB	8	3	24	3	94	6300**
Davie Boulevard	SB	8	3	12	3	88	8000*

Table 5-2
Typical Sections at Constrained Locations

Location	Direction	Shoulder Width (ft.)		Auxiliary Lane (ft.)	Number of GPL	Total Width (ft.)	Length of Reduced Section (ft.)
		Outside	Inside				
(SR 736) Underpass	NB	12	11	15	3	122	Not constrained
Park and Ride Ramp south of Broward Boulevard (SR 842)	SB	12	10	24	3	103	Not constrained
	NB	12	7	12	4	102	1200
North Woodlawn Cemetery	SB	12	5	0	4	88	2200***
	NB	6	5	24	4	106	1900****
Sunrise Boulevard (SR 838) Underpass	SB	15	5	0	4	94	2200***
	NB	8	3	12	4	94	1900****

*Southbound SR 84, South Fork New River, and Davie Boulevard are one continuous constrained section for 8000 ft.
**Northbound SR 84 and South Fork New River are one continuous constrained section for 6300 ft.
***Southbound North Woodlawn Cemetery and Sunrise Boulevard are one continuous constrained section for 2000 ft.
****Northbound North Woodlawn Cemetery and Sunrise Boulevard are one continuous constrained section for 2000 ft.

5.3.2 Build Alternatives 1A and 1B

Build Alternatives 1A and 1B are variations of Build Alternative 1. They also provide two tolled Express Lanes separated from the general purpose lanes by tubular markers. Build Alternatives 1A and 1B also include a combination of a standard typical section, reduced typical section and constrained typical sections similar to Build Alternative 1. Refer to **Figure 5-4** and **Figure 5-5**.

The main difference occurs at two locations: at the bridges over the South Fork New River (Build Alternative 1A) and at the Sunrise Boulevard (SR 838) interchange (Build Alternative 1B). Both locations are considered constrained typical sections under Build Alternative 1. In Build Alternative 1A and 1B, the design is modified in an effort to provide wider lanes and shoulders at these locations.

5.3.3 Build Alternative 1A

The mainline bridges over the South Fork New River are constrained by a Collector Distributor (CD) road bridge on either side. The southbound CD road bridge is further flanked by the CSX Railroad to the west. These restrictions make widening the mainline bridges impossible without impacting the existing CD road bridges and the railroad bridge over the South Fork New River.

Under Build Alternative 1, the northbound mainline bridge would require a constrained typical section with two 11 ft. Express Lanes, one 11 ft. general purpose lane, two 12 ft. general purpose lanes, two 12 ft. auxiliary lanes, an 8 ft. outside shoulder, a 3 ft. inside shoulder and a 2 ft. buffer between the Express Lanes and general purpose lanes. Under Build Alternative 1A, a concept was evaluated for the northbound mainline bridge to eliminate one of the existing auxiliary lanes to maximize the lane and shoulder widths. This concept would provide all 12 ft. lanes: two Express Lanes, three general purpose lanes, one auxiliary lane, a 10 ft. outside shoulder, an 8 ft. inside shoulder and a 4 ft. buffer between the Express Lanes and general purpose lanes for approximately 5000 ft. The northbound CD road bridge would accommodate three 12 ft. general purpose lanes, one 12 ft. auxiliary lane, and 10 ft. shoulders, as required for that type of facility. See **Figure 5-4** below.

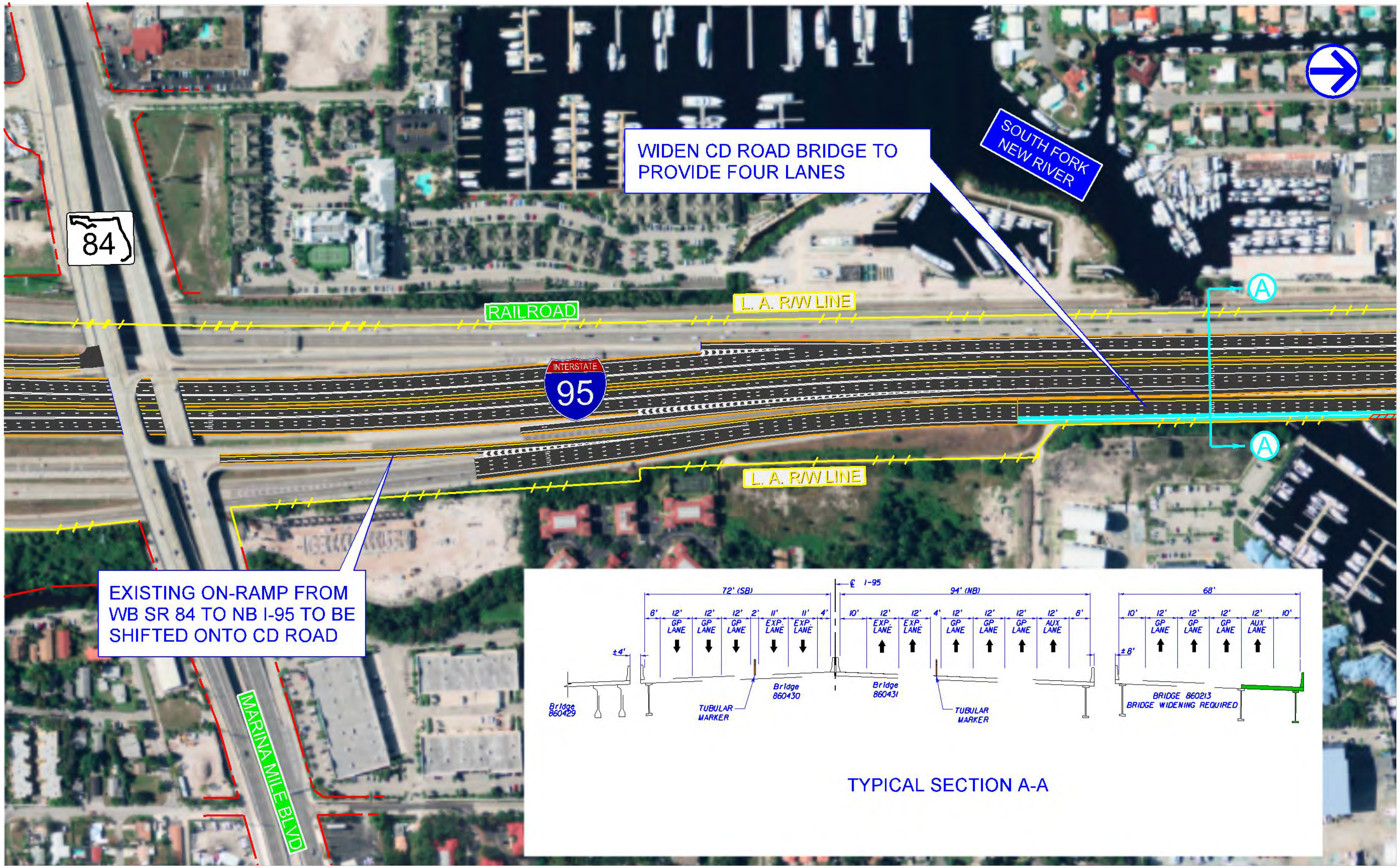


Figure 5-4
Build Alternative 1A

5.3.4 Build Alternative 1B

At the northbound approach to the Sunrise Boulevard (SR 838) interchange, I-95 currently features one HOV lane, four general purpose lanes, and two auxiliary lanes: one for the northbound to westbound exit ramp and one for the northbound to eastbound exit ramp. Immediately adjacent to these auxiliary lanes is the North Woodlawn Cemetery. The significance of the North Woodlawn Cemetery is detailed in the **Cultural Resource Assessment Survey** on file at FDOT District 4. To minimize and avoid impacting this resource, Build Alternative 1 was designed to maintain the existing outside edge of pavement; therefore, no widening is required toward the outside. A constrained typical section is required at this location.

In the northbound direction, the typical section features two 11 ft. Express Lanes, one 11 ft. general purpose lane, three 12 ft. general purpose lanes, two 12 ft. auxiliary lanes, a 5 ft. inside shoulder, and maintains the existing 6 ft. outside shoulder. There is a 2 ft. buffer between the Express Lanes and general purpose lanes. This will also require widening the facility toward the median by approximately 6 ft. This inside widening can be accommodated above the original ground elevation.

The proposed southbound typical section features two 11 ft. Express Lanes, one 11 ft. general purpose lane, three 12 ft. general purpose lanes, a 5 ft. inside shoulder, and a 12 ft. outside shoulder. There is a 2 ft. buffer between the Express Lanes and general purpose lanes. This will require widening the facility toward the median by approximately 6 ft. This inside widening can be accommodated above the original ground elevation.

Under Build Alternative 1B, the auxiliary lane for the northbound to eastbound exit is combined with the auxiliary lane for the northbound to westbound exit. This modification would allow the existing edge of pavement immediately adjacent to the North Woodlawn Cemetery to be maintained while providing standard lane widths along I-95 northbound. The typical section at this location consists of: two 12 ft. Express Lanes, four 12 ft. general purpose lanes, one 12 ft. auxiliary lane, a 12 ft. inside shoulder and a 6 ft. outside shoulder. There is a 4 ft. buffer between the Express Lanes and general purpose lanes. These improvements, however, essentially convert the existing eastbound exit auxiliary lane to both an eastbound and westbound exit lane. This modification would require the realignment of the northbound to westbound exit lane underneath the Sunrise Boulevard (SR 838) overpass to behind the existing bridge piers. The northbound typical section under the Sunrise Boulevard (SR 838) overpass would then feature two 12 ft. Express Lanes, four 12 ft. general purpose lanes, a 10 ft. inside shoulder, and a 8 ft. outside shoulder, along with a separate 15 ft. one lane ramp with 6 ft. inside and outside shoulders, as shown in **Figure 5-5** below.

Figure 5-5
Build Alternative 1B

5.3.5 Horizontal Alignment

The improvements for Build Alternative 1 can be attained by widening the facility, resulting in a proposed horizontal alignment that generally follows the alignment of the existing facility. The one area where the alignment will vary slightly from the existing is in the vicinity of the Broward Boulevard (SR 842) interchange. This area includes ramps from Broward Boulevard (SR 842), Davie Boulevard (SR 736), and from the park and ride lots. The park and ride ramps merge into the Express Lanes. Existing curves H9 through H19 were all modified to accommodate the proposed improvements. Compound Curves H14, H15, and H16 were redesigned and are now represented in the tables below as Curve H14. The existing horizontal alignment features four horizontal curves that do not meet the minimum requirement for superelevation: H1, H2, H4, and H18. All four curves can be corrected with overbuild as follows:

- Curve H1 and H2 – approximately 2.16 in. of overbuild
- Curve H4 – approximately 0.72 in. of overbuild
- Curve H18 – approximately 5.76 in. of overbuild

Table 5-3 details the proposed curvature and superelevation for the corridor.

Table 5-3
Proposed Horizontal Alignment - Radius of Curvature and Superelevation

Curve No.	Curve Parameters					Criteria		Variations or Exceptions
	Baseline	Design Speed (mph)	Radius (ft.)	Superelevation	Length (ft.)	PPM	AASHTO	
H1	NB & SB	65	5779.600	0.033	1,078.07	0.033	0.033	OK
H2	NB & SB	65	5779.570	0.033	1,064.86	0.033	0.033	OK
H3	NB & SB	65	28647.890	0.020	2,003.86	NC	NC	OK
H4	NB & SB	65	5729.570	0.033	2,294.27	0.033	0.033	OK
H5	NB & SB	65	28648.13	0.020	2,333.52	NC	NC	OK
H6	NB & SB	65	11458.060	0.020	835.74	0.020	0.020	OK
H7	NB & SB	65	11458.690	0.030	682.30	0.020	0.020	OK
H8	NB & SB	65	22918.350	0.020	1,982.45	NC	NC	OK
H9	NB	65	22929.00	0.020	2,073.86	NC	NC	OK
H10	NB	65	23988.00	0.020	975.02	NC	NC	OK
H11	NB	65	10511.00	0.020	786.65	RC	RC	OK
H12	NB	65	10511.00	0.020	560.39	RC	RC	OK
H13	NB	65	11989.00	0.020	1,426.11	RC	RC	OK
H14	SB	65	15048.00	0.020	1,873.05	NC	NC	OK
H15	SB	Curves H15 and H16 combined with curve H14						
H16	SB							
H17	SB	65	9009.00	0.021	1,199.91	0.021	0.021	OK
H18	SB	65	4573.00	0.041	678.17	0.041	0.041	OK
H19	SB	65	5022.00	0.038	484.87	0.038	0.038	OK
H20	NB & SB	65	11459.560	0.020	7751.68	0.020	0.020	OK
H21	NB & SB	65	4583.660	0.047	2,053.46	0.041	0.041	OK
H22	NB & SB	65	5729.620	0.037	947.11	0.033	0.033	OK
H23	NB & SB	65	5729.590	0.039	946.90	0.033	0.033	OK

The horizontal curves for the corridor generally remain the same, with the exception of the curves from H9 to H19, as previously noted. In the existing horizontal alignment, a total of 12 horizontal curves do not meet the minimum curve length requirement. Three of the deficient curves, H14, H15, and H16, were combined and the length of curve H14 now meets the minimum length requirement. The remaining nine deficient curves would require reconstruction to upgrade their lengths and as such, a design variation is proposed (see **Table 5-4**).

Table 5-4
Proposed Horizontal Alignment – Horizontal Curve Length

Curve No.	Curve Parameters					PPM/AASTHO Criteria		Variations or Exceptions
	Baseline	Design Speed (mph)	Radius (ft.)	Superelevation	Length (ft.)	Desirable (ft.)	Minimum (ft.)	
H1	NB & SB	65	5779.600	0.030	1,078.07	1950	975	OK
H2	NB & SB	65	5779.570	0.030	1,064.86	1950	975	OK
H3	NB & SB	65	28647.890	0.020	2,003.86	1950	975	OK
H4	NB & SB	65	5729.570	0.032	2,294.27	1950	975	OK
H5	NB & SB	65	28648.13	0.020	2,333.52	1950	975	OK
H6	NB & SB	65	11458.060	0.020	835.74	1950	975	Variation
H7	NB & SB	65	11458.690	0.030	682.30	1950	975	Variation
H8	NB & SB	65	22918.350	0.020	1,982.45	1950	975	OK
H9	NB	65	22929.00	0.020	2,073.86	1950	975	OK
H10	NB	65	23988.00	0.020	975.02	1950	975	OK
H11	NB	65	10511.00	0.020	786.65	1950	975	Variation
H12	NB	65	10511.00	0.020	560.39	1950	975	Variation
H13	NB	65	11989.00	0.020	1,426.11	1950	975	OK
H14	SB	65	15048.00	0.020	1,873.05	1950	975	OK
H15	SB	Curves H15 and H16 combined with curve H14						
H16	SB							
H17	SB	65	9009.00	0.021	1,199.91	1950	975	OK
H18	SB	65	4573.00	0.041	678.17	1950	975	Variation
H19	SB	65	5022.00	0.038	484.87	1950	975	Variation
H20	NB & SB	65	11459.560	0.020	751.68	1950	975	Variation
H21	NB & SB	65	4583.660	0.047	2,053.46	1950	975	OK
H22	NB & SB	65	5729.620	0.037	947.11	1950	975	Variation
H23	NB & SB	65	5729.590	0.039	946.90	1950	975	Variation

There are no existing or proposed horizontal sight distance deficiencies along the corridor. **Table 5-5** details the proposed horizontal sight distance along the corridor.

Table 5-5
Proposed Horizontal Alignment – Horizontal Sight Distance

Curve No.	Curve Parameters					Criteria		Variations or Exceptions
	Baseline	Design Speed (mph)	Radius (ft.)	Horizontal Sightline Offset (ft.)	Sight Distance (ft.)	PPM (ft.)	AASHTO (ft.)	
H1	NB & SB	65	5779.600	16.50	874	730.00	645.00	OK
H2	NB & SB	65	5779.570	16.50	874	730.00	645.00	OK
H3	NB & SB	65	28647.890	11.50	1623	730.00	645.00	OK
H4	NB & SB	65	5729.570	16.50	870	730.00	645.00	OK
H5	NB & SB	65	28648.13	16.50	1945	730.00	645.00	OK
H6	NB & SB	65	11458.060	11.50	1027	730.00	645.00	OK
H7	NB & SB	65	11458.690	11.50	1027	730.00	645.00	OK
H8	NB & SB	65	22918.350	11.50	1452	730.00	645.00	OK
H9	NB	65	22929.00	11.50	1452	730.00	645.00	OK
H10	NB	65	23988.00	11.50	1452	730.00	645.00	OK
H11	NB	65	10511.00	16.50	1486	730.00	645.00	OK

Table 5-5
Proposed Horizontal Alignment – Horizontal Sight Distance

Curve No.	Curve Parameters					Criteria		Variations or Exceptions
	Baseline	Design Speed (mph)	Radius (ft.)	Horizontal Sightline Offset (ft.)	Sight Distance (ft.)	PPM (ft.)	AASHTO (ft.)	
H12	NB	65	10511.00	11.50	1178	730.00	645.00	OK
H13	NB	65	11989.00	16.50	983	730.00	645.00	OK
H14	SB	65	15048.00	16.50	1409	730.00	645.00	OK
H15	SB	65	Curves H15 and H16 combined with curve H14					
H16	SB	65						
H17	SB	65	9009.00	11.50	910	730.00	645.00	OK
H18	SB	65	4573.00	40.00	1210	730.00	645.00	OK
H19	SB	65	5022.00	42.00	1300	730.00	645.00	OK
H20	NB & SB	65	11459.560	16.50	1230	730.00	645.00	OK
H21	NB & SB	65	4583.660	16.50	778	730.00	645.00	OK
H22	NB & SB	65	5729.620	16.50	870	730.00	645.00	OK
H23	NB & SB	65	5729.590	16.50	870	730.00	645.00	OK

Under Build Alternative 1A, the modified ramp from westbound SR 84 to northbound I-95, via the northbound CD road bridge, features five horizontal curves. The Design Speed of this ramp/CD road is 40 mph. All features were designed to comply with FDOT criteria, as detail in **Table 5-6** below.

Table 5-6
Build Alternative 1A – Horizontal Features at Modified Ramp

Curve No.	Curve Parameters					Superelevation Criteria		Variations or Exceptions
	Baseline	Design Speed (mph)	Radius (ft.)	Superelevation	Length (ft.)	PPM	AASHTO	
1	NB	40	11445	NC	1107	NC	NC	OK
2	NB	40	6739	NC	708	NC	NC	OK
3	NB	40	4548	RC	710	RC	RC	OK
4	NB	40	3964	0.021	294	0.021	0.021	OK
5	NB	40	4100	0.021	352	0.021	0.021	OK

5.3.6 Vertical Alignment

Build Alternative 1 features only minor modifications to the vertical alignment. An analysis of the existing vertical alignment indicated that one sag curve does not currently meet the minimum vertical curve length required by AASHTO and would require a design exception for vertical curve length. It is anticipated that this curve can be elongated with overbuild to meet the AASHTO requirement. A design variation would be required for this curve. In addition, 11 sag curves do not currently meet the minimum vertical curve length required by FDOT. It is anticipated that these curves can be elongated with overbuild to meet the FDOT requirement. No design variation or exception would be required for these 11 sag curves. Vertical alignment for Build Alternative 1 was not included in the scope of the study and as a result, Digital Terrain Modeling was not made available to further analyze the vertical alignment for Build Alternative 1. **Table 5-7** through **Table 5-9** summarize the potential improvements to the vertical alignment. These improvements should be further explored during the next phase of the project.

Table 5-7
Build Alternative 1 - Grades and K Values

Curve No.	Baseline	Design Speed (mph)	Vertical Curve Type	Grade		Δ G	Existing Curve Length (ft.)	Existing K-Value	Criteria- K Value		Variation or Exception
				Back	Ahead				PPM	AASHTO	
V1	NB & SB	65	Sag	Curve is outside of the project limits							
V2	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	401.00	193.00	Variation
V3	NB & SB	65	Sag	Sag curve to be brought up to PPM standards with overbuild							Variation
V4	SB	65	Sag	0.0000	2.5220	2.522	825.00	327.12	181.00	157.00	OK
V5	NB	65	Sag	0.0000	2.5220	2.522	800.00	317.21	181.00	157.00	OK
V6	NB & SB	65	Crest	2.522	2.434	4.956	1500.00	302.66	401.00	193.00	Variation
V7	NB & SB	65	Sag	Sag curve to be corrected with overbuild							
V8	NB & SB	65	Sag	0.000	1.500	1.500	600.00	400.00	181.00	157.00	OK
V9	NB & SB	65	Crest	1.500	0.500	2.000	640.00	320.00	401.00	193.00	Variation
V10	NB & SB	65	Sag	0.500	0.302	0.802	500.00	623.44	181.00	157.00	OK
V11	NB	65	Sag	0.3020	0.300	0.602	440.00	730.90	181.00	157.00	OK
V12	SB	65	Sag	0.302	0.300	0.602	500.00	830.56	181.00	157.00	OK
V13	NB	65	Crest	0.300	0.300	0.600	500.00	833.33	401.00	193.00	OK
V14	SB	65	Crest	0.300	0.300	0.600	500.00	833.33	401.00	193.00	OK
V15	NB & SB	65	Sag	0.300	0.300	0.600	500.00	833.33	181.00	157.00	OK
V16	NB & SB	65	Crest	0.300	0.300	0.600	500.00	833.33	401.00	193.00	OK
V17	NB & SB	65	Sag	0.300	3.000	3.300	778.00	235.76	181.00	157.00	OK
V18	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	401.00	193.00	Variation
V19	NB & SB	65	Sag	3.000	0.750	2.250	1000.00	266.67	181.00	157.00	OK
V20	NB & SB	65	Sag	0.750	0.400	1.150	1000.00	869.57	181.00	157.00	OK
V21	NB & SB	65	Crest	0.400	0.9	1.300	1000.00	769.23	401.00	193.00	OK
V22	NB & SB	65	Sag	0.9000	0.4200	1.320	800.00	606.06	181.00	157.00	OK
V23	SB	65	Crest	0.4200	0.3700	0.790	1000.00	1265.82	401.00	193.00	OK
V24	NB	65	Crest	0.420	0.300	0.720	1000.00	1388.70	401.00	193.00	OK
V25	NB	65	Sag	0.300	0.414	0.714	800.00	1120.45	181.00	157.00	OK
V26	SB	65	Sag	2.117	0.000	2.117	800.00	377.84	181.00	157.00	OK
V27	NB	65	Sag	2.137	0.000	2.117	800.00	374.36	181.00	157.00	OK
V28	SB	65	Sag	0.000	0.109	0.109	800.00	7332.72	181.00	157.00	OK
V29	NB	65	Sag	0.000	0.1040	0.104	800.00	7692.31	181.00	157.00	OK
V30	SB	65	Sag	0.1091	2.468	2.359	600.00	232.81	181.00	157.00	OK
V31	NB	65	Sag	0.104	2.503	2.399	600.00	230.16	181.00	157.00	OK
V32	SB	65	Crest	Curve to be reconstructed as part of the NW 19 Street bridge replacement							
V33	NB	65	Crest	Curve to be reconstructed as part of the NW 19 Street bridge replacement							
V34	SB	65	Sag	2.484	0.000	2.484	800.00	322.06	181.00	157.00	OK
V35	NB	65	Sag	2.496	0.000	2.496	800.00	320.46	181.00	157.00	OK
V36	SB	65	Sag	0.000	2.478	2.478	600.00	242.16	181.00	157.00	OK
V37	NB	65	Sag	0.000	2.515	2.515	600.00	238.60	181.00	157.00	OK
V38	SB	65	Crest	2.478	2.007	4.485	1170.00	260.86	401.00	193.00	Variation
V39	NB	65	Crest	2.515	2.023	4.538	1170.00	257.82	401.00	193.00	Variation

Table 5-8
Build Alternative 1 - Vertical Curve Length

Curve No.	Baseline	Design Speed (mph)	Vertical Curve Type	Grade		Δ G	Existing Curve Length (ft.)	Existing K-Value	Criteria- Curve Length		Variation or Exception
				Back	Ahead				PPM	AASHTO	
V1	NB & SB	65	Sag	Curve is outside of the project limits							
V2	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	1800.00	1158.00	OK
V3	NB & SB	65	Sag	Sag curve to be brought up to PPM standards with overbuild							Variation
V4	SB	65	Sag	0.0000	2.5220	2.522	825.00	327.12	800.00	395.95	OK
V5	NB	65	Sag	0.0000	2.5220	2.522	800.00	317.21	800.00	395.95	OK
V6	NB & SB	65	Crest	2.522	2.434	4.956	1500.00	302.66	1800.00	956.51	Variation
V7	NB & SB	65	Sag	Sag curve to be corrected with overbuild							
V8	NB & SB	65	Sag	Sag curve to be corrected with overbuild							
V9	NB & SB	65	Crest	1.500	0.500	2.000	640.00	320.00	1000.00	386.00	Variation
V10	NB & SB	65	Sag	Sag curve to be corrected with overbuild							
V11	NB	65	Sag	Sag curve to be corrected with overbuild							
V12	SB	65	Sag	Sag curve to be corrected with overbuild							
V13	NB	65	Crest	0.300	0.300	0.600	500.00	833.33	1000.00	115.80	Variation
V14	SB	65	Crest	0.300	0.300	0.600	500.00	833.33	1000.00	115.80	Variation
V15	NB & SB	65	Sag	Sag curve to be corrected with overbuild							
V16	NB & SB	65	Crest	0.300	0.300	0.600	500.00	833.33	1000.00	115.80	Variation
V17	NB & SB	65	Sag	Sag curve to be corrected with overbuild							
V18	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	1000.00	1158.00	OK
V19	NB & SB	65	Sag	3.000	0.750	2.250	1000.00	266.67	800.00	588.75	OK
V20	NB & SB	65	Sag	0.750	0.400	1.150	1000.00	869.57	800.00	180.55	OK
V21	NB & SB	65	Crest	0.400	0.9	1.300	1000.00	769.23	1000.00	250.90	OK
V22	NB & SB	65	Sag	0.9000	0.4200	1.320	800.00	606.06	800.00	207.24	OK
V23	SB	65	Crest	0.4200	0.3700	0.790	1000.00	1265.82	1000.00	152.47	OK
V24	NB	65	Crest	0.420	0.300	0.720	1000.00	1388.70	1000.00	138.98	OK
V25	NB	65	Sag	0.300	0.414	0.714	800.00	1120.45	800.00	112.10	OK
V26	SB	65	Sag	2.117	0.000	2.117	800.00	377.84	800.00	332.42	OK
V27	NB	65	Sag	2.137	0.000	2.117	800.00	374.36	800.00	335.51	OK
V28	SB	65	Sag	0.000	0.109	0.109	800.00	7332.72	800.00	17.13	OK
V29	NB	65	Sag	0.000	0.1040	0.104	800.00	7692.31	800.00	16.33	OK
V30	SB	65	Sag	Sag curve to be corrected with overbuild							
V31	NB	65	Sag	Sag curve to be corrected with overbuild							
V32	SB	65	Crest	Curve to be reconstructed as part of the NW 19 Street bridge replacement							
V33	NB	65	Crest	Curve to be reconstructed as part of the NW 19 Street bridge replacement							
V34	SB	65	Sag	2.484	0.000	2.484	800.00	322.06	800.00	389.99	OK
V35	NB	65	Sag	2.496	0.000	2.496	800.00	320.46	800.00	391.93	OK
V36	SB	65	Sag	Sag curve to be corrected with overbuild							
V37	NB	65	Sag	Sag curve to be corrected with overbuild							
V38	SB	65	Crest	2.478	2.007	4.485	1170.00	260.86	1800.00	865.62	Variation
V39	NB	65	Crest	2.515	2.023	4.538	1170.00	257.82	1800.00	875.85	Variation

Table 5-9
Build Alternative 1 - Vertical Stopping Sight Distance

Curve No.	Baseline	Vertical Curve Type	Grade		Δ G	Existing Curve Length (ft.)	Existing SSD		Criteria - SSD		Variation or Exception
			Back	Ahead			PPM	AASHTO	PPM	AASHTO	
V2	NB & SB	Crest	3.000	3.000	6.000	1800.00	631.46	804.67	730.00	645.00	Variation
V6	NB & SB	Crest	2.522	2.434	4.956	1500.00	634.26	808.23	730.00	645.00	Variation
V9	NB & SB	Crest	1.500	0.500	2.000	640.00	652.17	831.06	730.00	645.00	Variation
V13	NB	Crest	0.300	0.300	0.600	500.00	1052.44	1341.11	730.00	645.00	OK
V14	SB	Crest	0.300	0.300	0.600	500.00	1052.44	1341.11	730.00	645.00	OK
V16	NB & SB	Crest	0.300	0.300	0.600	500.00	1052.44	1341.11	730.00	645.00	OK
V18	NB & SB	Crest	3.000	3.000	6.000	1800.00	631.46	804.67	730.00	645.00	Variation
V21	NB & SB	Crest	0.400	0.9	1.300	1000.00	1011.15	1288.50	730.00	645.00	OK
V23	SB	Crest	0.4200	0.3700	0.790	1000.00	1297.10	1652.88	730.00	645.00	OK
V24	NB	Crest	0.420	0.300	0.720	1000.00	1358.60	1731.25	730.00	645.00	OK
V32	SB	Crest	Curve to be reconstructed as part of the NW 19 Street bridge replacement								
V33	NB	Crest	Curve to be reconstructed as part of the NW 19 Street bridge replacement								
V38	SB	Crest	2.478	2.007	4.485	1170.00	588.84	750.35	730.00	645.00	Variation
V39	NB	Crest	2.515	2.023	4.538	1170.00	585.39	745.95	730.00	645.00	Variation

Under Build Alternative 1A, the westbound SR 84 to northbound I-95 ramp was realigned to tie into the northbound CD road over the South Fork New River. As shown in **Table 5-10** below, the vertical alignment of the new ramp features two vertical curves: a crest curve and a sag curve that were both designed to meet FDOT criteria.

Table 5-10
Vertical Alignment - Build Alternative 1A

Curve No.	Design Speed	Vertical Curve Type	Back Grade	Ahead Grade	Δ G	Curve Length (ft.)		K-Value		Stopping Sight Distance (ft.)	
						Design	PPM	Design	PPM	Design	PPM
1	40 mph	Crest	0.000	5.000	5.000	350	350	70	70	305	305
2	40 mph	Sag	5.000	0.000	5.000	395	395	79	64	-	-

5.3.7 Conceptual Plans

Concept Plans are included in Chapter 7.

5.3.8 Right of Way

No right of way acquisition is anticipated to accommodate the roadway improvements required to implement Build Alternative 1.

Build Alternative 1B, which widens the northbound CD road over the South Fork New River, would require a 12 ft. wide sliver of right of way approximately 430 ft. long immediately north of the South Fork New River, just east of the CD road. See **Figure 5-6**.

Figure 5-6
Right of Way Acquisition

5.3.9 Cost Estimates

The preliminary cost estimate for Build Alternative 1 is shown in **Table 5-11**. Using the FDOT Long Range Estimate System (LRE), each sequence was evaluated based on the numerous components to establish a cost per sequence. These were subsequently summed up and a grand total was ultimately derived after factoring in maintenance of traffic, mobilization, project unknowns, and project non-bid items.

Table 5-11
Preliminary Cost Estimate

Build Alternative	Long Range Estimate	20% Contingency	Total
1	$70,413,471	$14,082,694	**$84,496,165**
1A	$79,000,000	$15,800,000	**$94,800,000**
1B	$71,000,000	$14,200,000	**$85,200,000**

5.3.10 Preliminary Drainage

All three Build Alternatives were evaluated during the preliminary drainage analysis conducted for this study. Build Alternatives that have the same roadway footprint, within a given Drainage System, were grouped by Drainage System to streamline the analysis. A summary of the net increase in impervious area for each Build Alternative is shown below in **Table 5-12**.

Table 5—12
Net Increase in Impervious Area

System	Stationing (Ft)		Increase Impervious Area (Ac.)			Comments
	Begin	End	Alt 1	Alt 1A	Alt 1B	
A	954+40	1009+00	2.44	2.44	2.44	All three Alternatives have the same footprint
B	1009+00	1056+00	2.91	2.91	2.91	
C	1056+00	1108+00	3.34	3.34	3.34	
D	1108+00	1163+00	1.41	2.17	1.41	ALT 1A has a wider footprint
E	1163+00	1198+00	0.11	1.14	0.11	
F	1198+00	1264+00	1.46	1.46	1.46	All three Alternatives have the same footprint
G	1264+00	1342+00	3.05	3.05	3.57	ALT 1B has a wider footprint
H	1342+00	1405+00	4.05	4.05	4.05	All three Alternatives have the same footprint
I	1405+00	1441+00	2.31	2.31	2.31	

Stormwater treatment of the project runoff will be provided as required by the SFWMD Environmental Resource Permit (ERP). The Stormwater management systems proposed by this study meet existing water quality standards set forth in Chapter 62-302 of the Florida Administrative Code. Water quality will be provided for the increase in impervious area. The post-development discharge volume will be attenuated so that it is not greater than the predevelopment discharge. The project area outfalls to water bodies identified by the Florida Department of Environmental Protection (FDEP) as impaired waters. Nutrient loading calculations were performed based on the modified Harper methodology where the predevelopment condition is the existing condition. Calculations for the stormwater management system are contained in the **Stormwater Management Report** on file at FDOT District 4. The proposed stormwater management system will not require acquisition of right of way.

5.3.11 Lighting

Light poles for the I-95 mainline are predominantly located within the median. For most of the corridor, the existing median will not be impacted and the existing lighting for the corridor will be maintained. However, the median from approximately 800 ft. to the south of SR 84 to approximately 600 ft. to the north of SR 84 is a 14 ft. wide concrete median that will be replaced by a concrete barrier wall. The median within this segment contains five light poles that will require relocation from the existing concrete median to the proposed barrier wall. Further analysis and evaluation of the existing lighting system will be performed during the final design phase.

5.3.12 Utilities

The 17 Utility Agency Owners (UAO) contacted have indicated that they have facilities that could be impacted by the proposed improvements under the Build Alternative. These UAOs are:

- AT&T Florida
- Broward Co. Water & Sewer
- Broward Co. ITS
- Broward Co. Traffic
- City of Dania Beach Eng. Dept.
- City of Fort Lauderdale
- City of Hollywood
- City of Oakland Park
- Comcast
- FiberLight LLC
- Florida Gas Transmission
- FPL – Distribution
- FPL - FiberNet
- FPL – Transmission
- Level3 Communications LLC
- Time Warner Telecom.
- Verizon Business (f.k.a. MCI)

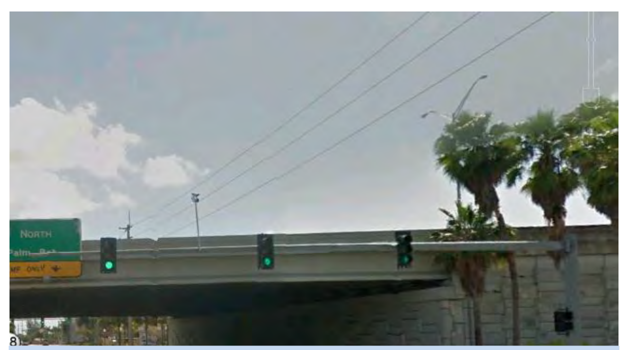
Table 5-13 shows the utilities at all interchanges and at key overpasses where these potential utility impacts may result from the proposed construction.

Table 5-13
Utilities

Location along I-95	Utilities						
	Electric	**WM**	**FM**	**Gas**	**BFO**	**BT**	**Jet Fuel**
Stirling Road (SR 848) Interchange	23KV & 138 KV	12 in.	4 & 10 in.	6 in.	2 conduits	4 in. conduit	-
North of Stirling Road (SR 848) interchange	23KV & 138 KV	-	-	-	-	1 conduit	-
Griffin Road (SR 818)	23KV	12 & 16 in.	10 in.	6 in.	2 conduits	2 conduits	10 in.
SW 42nd Street	23KV	10 & 12 in.	10 & 12 in.	-	1 conduit	-	-
I-595		12 in.	-	16 in.	2 conduits	-	-
SR 84	23KV	-	-	-	1 conduit	-	-
Davie Boulevard (SR 736)	BE	24 in.	-	1 gas line	2 conduits	-	-
Broward Boulevard (SR 842)	-	36 in.	-	-	1 conduit	1 conduit	-
NW 6th Street	23KV, 138 KV	10 in.	14 & 18 in.	-	1 conduit	-	-
Sunrise Boulevard (SR 838)	23KV	-	-	-	1 conduit	1 conduit	-
NW 19th Street	23KV	10 & 24 in.	12 in.	-	1 conduit		-
Oakland Park Boulevard (SR 816)	23KV, 138 KV	18 in.	12 in.	-	2 conduits	1 conduit	-

Stirling Road (SR 848) Interchange

Florida Power & Light Distribution and Transmission own several 23 KV and 138KV overhead electric lines and other underground facilities within the interchange. These bridges will not be widened;thus, there are no conflicts with these power lines.. North of the interchange, there is a utility easement for several overhead 23KV and 138KV FPL lines that cross I-95. These overhead electric lines will not be in direct conflict with the proposed roadway widening at this location. However, safety precaution will be required for the use of high construction cranes at the vicinity of these high voltage power lines.


Overhead Electric at Stirling Road (SR 848)

Broward County Public Works Department operates a 12 in. water main and two sewer lines that run underground along Stirling Road (SR 848). These facilities will not conflict with the proposed roadway work at the ramp terminals..

A 6 in. gas line owned by the Florida Gas Transmission (FGT) Company runs underground on the north side of Stirling Road (SR 848). Conflicts with roadway work at the ramps terminal are not expected. FGT has indicated that the locations shown on their drawings for the gas line are approximate and must be field verified by FGT representatives before performing any excavation 5-ft from the facility.

AT&T owns several buried fiber optics and telephone lines within this interchange. They may be impacted by the roadway work at the ramp terminals. These facilities should be field verified during the final design to determine the appropriate conflict resolution strategies. In addition, the FDOT owned main trunk fiber optic cables run on the east of I-95 near the existing MSE walls.. These cables support the entire I-95 ITS infrastructure and are not expected to be impacted by the roadway work at the ramps terminals.

Griffin Road (SR 818) Interchange

Florida Power & Light Distribution and Transmission owns several 23 KV overhead electric lines and other underground facilities within the interchange. The concrete strain poles supporting the 23KV lines across I-95 are adequately spaced from the bridges and should not be impacted by their widening. However, safety precautions will be required for the use of high construction cranes in the vicinity of these high voltage power lines. The potential conflicts between the buried electric and the proposed improvements at this interchange will be addressed during the final design.

Overhead Electric at Griffin Road (SR 818)

Broward County Public Works Department owns two water mains: 12 in. and a 16 in. and a 10 in. force main that run underground along the travel way of Griffin Road (SR 818). These facilities do not seem to conflict with the current bridge piers. As a result, the proposed widening of these two bridges may not impact these facilities. However, they should be vertically and horizontally verified during final design and construction.

A 10 in. transmission pipeline owned by the Florida Gas Transmission Company runs underground along the westbound travel lanes of Griffin Road (SR 818). Impacts to this fuel line by the proposed bridge widening and new MSE walls at this location are not anticipated. FGT has indicated that the locations shown on their drawings for the pipeline are approximate and must be field verified by FGT representatives before performing any excavation 5 ft. from the facility.

Level (3) Communications and AT&T own several buried fiber optics and telephone lines within this interchange. They may be impacted by the new piers for the bridge widening and MSE walls. These facilities should be field verified during the final design to determine the appropriate conflict resolution strategies. In addition, the FDOT owned main trunk fiber optic cables run on the east of I-95 near the existing MSE walls that will be replaced. These cables support the entire I-95 ITS infrastructure and must be field verified during final design to resolve any potential conflicts.

SW 42nd Street Overpass Bridge

Florida Power & Light Distribution and Transmission owns a 23 KV overhead electric line crossing I-95 near this overpass bridge. This electric line is not in direct conflict with the roadway widening; however, safety precautions will be required for the use of high construction cranes in the vicinity of this high voltage power line.

Broward County Public Works Department operates two water mains and two force mains (10 in. and 12 in.) that run underground across I-95. These facilities should not be impacted by the roadway widening at this location. Nonetheless, it is recommended to verify them during final design and construction to clear all potential conflicts.

I-595 Interchange

Broward County Public Works Department owns a 12 in. water main that runs underground across I-95. This utility should not be impacted by the roadway widening at this location. Nonetheless, it is recommended to verify them during final design and construction to clear all potential conflicts.

A 16 in. gas line, owned by the Florida Gas Transmission Company, crosses I-95 underground at this location. However, it is recommended to verify it during final design and construction to clear all potential conflicts.

There is a buried fiber optic cable across I-95 at this interchange. This facility, owned by FDOT, links the I-595 and I-95 ITS infrastructure. The widening of the roadway at this location is not expected to impact these cables. However, verifying them is recommended for clearance.

SR 84

Florida Power & Light Distribution and Transmission owns a 23 KV overhead electric line crossing I-95 at this interchange. This electric line is not in direct conflict with the roadway widening; however, safety precautions will be required for the use of high construction cranes in the vicinity of this high voltage power line.

AT&T owns several buried fiber optic lines that run along both sides of SR 84 and terminate just east of I-95. They should not be impacted by the roadway widening at this location.

Davie Boulevard (SR 736)

The city of Fort Lauderdale owns a 24 in. underground water main across I-95 at this location. This facility will not be in direct conflict with the proposed roadway widening. However, this line may be impacted by the reconstruction of the concrete barrier wall in the median and potential new MSE along the southbound off-ramp. The foundation of these structures could be designed to minimize or avoid conflicts based on the results of test holes. This verification should be performed during final design and construction.

Florida Power & Light owns a 23 KV overhead electric line crossing I-95 at this interchange. This electric line is not in direct conflict with the roadway widening; however, safety precautions will be required for the use of high construction cranes in the vicinity of this high voltage power line. There is also a buried electric (lighting) line that crosses I-95 near this overpass bridge. This electric line may be impacted by the roadway widening.

A 6 in. gas line runs underground on the north side of Davie Boulevard (SR 736). This gas line will potentially be impacted by the construction of the new MSE walls along the southbound off-ramp and the concrete barrier wall in the median. Field verification will be required to help resolve this potential conflict.

Broward Boulevard (SR 842) Interchange

The city of Fort Lauderdale owns a 36 in. underground water main across I-95 at this location. This facility will not be in direct conflict with the proposed roadway widening; however, it is recommended to field verify it during design for clearance.

FDOT owned fiber optic cables cross beneath I-95 at this interchange. In addition, AT&T operates several buried telephone lines that run east-west along Broward Boulevard (SR 842). These facilities are not expected to be impacted by the roadway widening.

I-95 Bridge at NW 6th Street

Florida Power & Light Distribution and Transmission owns several 23 KV and 138KV overhead electric lines that cross I-95 at this bridge which will be widened on the inside. Therefore, these electric lines should not be impacted by the bridge work. However, safety precautions will be required for the use of high construction cranes in the vicinity of these high voltage power lines.

The city of Fort Lauderdale owns a 10 in. underground water main and two force mains, 14 & 18 in., across I-95 at this location. These utilities will not be in direct conflict with the proposed roadway widening; however, it is recommended to field verify them during design and construction.

Sunrise Boulevard (SR 842) Interchange

Florida Power & Light owns a 23 KV overhead electric line crossing I-95 at this interchange. This electric line is not in direct conflict with the roadway widening; however, safety precautions will be required for the use of high construction cranes in the vicinity of this high voltage power line. There are also several buried electric (lighting) lines crossing I-95 near this overpass bridge that may be impacted by the roadway widening at this location. The contractor will be instructed to maintain lighting during construction.

AT&T owns several fiber optic cables in conduits attached beneath the bridge. These lines are not expected to be impacted by the roadway work on I-95 mainline.

I-95 Bridge at NW 19th Street

Florida Power & Light Distribution and Transmission owns several 23 KV overhead electric lines and other underground facilities across I-95 at this location. The NW 19th Street bridge is recommended to be replaced. Potential conflicts with new foundations will be resolved during final design.

The city of Fort Lauderdale owns two underground water mains, 10 in. & 24 in. and a 12 in. force main across I-95 at this location. These utilities will not be in direct conflict with the proposed roadway widening; however, it is recommended to field verify them during design and construction.

Oakland Park Boulevard (SR 816) Interchange

Florida Power & Light owns several overhead electric lines crossing I-95 at this interchange. These electric lines are not in direct conflict with the roadway widening; however, safety precautions will be required for the use of high construction cranes in the vicinity of this high voltage power line. There are also several buried electric (lighting) lines crossing I-95 near this overpass bridge that may be impacted by the roadway widening at this location. The contractor will be instructed to maintain lighting during construction.

The city of Fort Lauderdale owns a 12 in. underground force main that crosses I-95 at this location. This force main will not be in conflict with the new piers required for the bridge widening; however, it is recommended to field verify it during design for clearance.

AT&T and Level (3) Communications operate several fiber optic cables and buried telephone across I-95 within this interchange. These lines are not expected to be impacted by the roadway work on I-95 mainline, but they should be vertically and horizontally verified during final design for clearance.

ITS

In addition to the aforementioned utilities at the interchanges and overpasses, ITS Fiber Optic cables run along the east side of I-95 from the beginning of the project to just north of SR 84 where they cross to the west side and run along the right of way line until the end of the project. These ITS Fiber Optic cables run close to the right of way line and could be impacted by the recommended noise wall from Broward Boulevard to NW 6 Street (Sistrunk Boulevard). Their exact location is not known at this time and should be verified during design and construction. It should be noted that most of the UAO(s) owning major facilities within the area of the project have master agreements with FDOT. Should the need to relocate arise, this should expedite the coordination process eliminating the need for individual work agreements. The approximate locations of the utilities are shown in the concept plans.

5.3.13 Traffic Control Concepts

Proper traffic control will be critical in order to minimize impacts to the commuters and construction cost. Care should be taken to ensure the safety of motorists and workers, maintain the mobility of both vehicular and pedestrian traffic, and minimize impacts to transit and businesses. The traffic control shall be designed as per the FDOT Design Standard Index 600 series.

The traffic control process will begin with a lane closure analysis to determine the feasibility of limited or extended lane closures along I-95. If lane closures are not deemed feasible, temporary pavement construction will be required.

For this project, the corridor has been divided into four segments based on the typical sections:

- Stirling Road (SR 848) to SR 84
- SR 84 to south of the Park & Ride
- Segment between Park & Ride ramps
- North of the Park & Ride to Oakland Park Boulevard (SR 816)

Generally, the widening of the project corridor can be accomplished in two phases for each direction. Depending on the existing right of way, location of travel lanes, bridges, and the horizontal clearance areas, the two-phase process will either begin on the shoulder or median of the roadway. Milling and resurfacing and overbuild operations will be performed in a third phase, once widening has been completed.

The bridges along the project corridor will require a similar approach for the maintenance of traffic. However, two bridges will require a slightly different scheme than the roadway: the bridges at NW 6 Street and NW 19 Street. The bridges NW 6 Street will be widened towards the inside and the bridges at NW 19 Street will be replaced. Construction phasing and sequencing for the NW 19 Street bridge is summarized in Chapter 6 of this report and detailed the **Bridge Analysis Report** on file at FDOT District 4.

It should also be noted that there are above ground power lines that will require the traffic control plan to be developed to include the appropriate working clearances as per the Occupational Safety and Health Administration (OSHA) guidelines.

A detailed description of the Temporary Traffic Control Plan for the Recommended Alternative is included in **Section 6.8** of this report.

5.3.14 Bicycle and Pedestrian Accommodations

No pedestrian and bicycle facilities are planned as part of the proposed improvements along I-95. Pedestrian and bicycle facilities are present along several of the overpasses and underpasses of the cross streets and these facilities will not be impacted as part of either build alternative.

5.3.15 Multi-Modal Accommodations

For each transportation improvement project it is necessary to consider opportunities for accommodating and incorporating multimodal facilities such as park-and-ride lots to facilitate and encourage the use of various travel modes. The project level evaluation for the SR 9/I-95 PD&E section between Stirling Road and North of Oakland Park Boulevard seeks to identify the feasibility of locating a park-and-ride facility at interchanges within the study corridor to encourage and expand multi-modal use. A successful park-and-ride lot is one that is strategically located to serve the traveling public who makes longer than average commuting trips and is accessible by transit services and ridesharing programs (van pooling and carpooling).

5.3.15.1 Existing Multimodal Accommodations

Within the study area, there is currently one park and ride facility located on the west side of the I-95 Interchange with Broward Boulevard. The facility is currently used as the northern terminus of the I-95 Express Route running down to Downtown Miami. The lot is also used for carpooling and vanpooling activities. The existing HOV lanes on I-95 can be accessed from the Broward Boulevard Park and Ride lot.

Recently, in Spring of 2012, a new park-and-ride opened just south of the limits of this project, on Sheridan Street.

5.3.15.2 Existing Express Bus Operation

Currently, I-95 Express bus service operates between Miami and Fort Lauderdale (Broward Boulevard) and there is an active Florida Department of Transportation (FDOT) carpooling and vanpooling program within the study area. Future plans include the implementation of I-595 Express bus service to Fort Lauderdale and Miami as well as additional buses for I-95 Express service that would operate once Phase 2 of the I-95 Express Lanes from Golden Glades to Broward Boulevard is completed in late 2014.

5.3.15.3 Evaluation of Potential Multimodal Facilities

The eight interchanges located along the study corridor present potential opportunities for locating a park-and-ride facility. The *FDOT State Park-and-Ride Manual* was referenced for the evaluation of incorporating a park-and-ride facility within these interchanges. For this evaluation, the site selection criteria that was applied includes the following:

- Availability of Right-of-Way (FDOT surplus land or vacant property)
- Transit Service - existing or planned transit service (e.g., I-95 Express bus service)
- Visibility
- Accessibility (within a ½ mile of I-95 interchange)

The selection of a suitable park-and-ride location primarily determines the successful utilization of a site. Therefore, land availability or right-of-way is considered for this evaluation as a primary factor for assessing the feasibility of locating a park-and-ride lot at an interchange.

Four of the eight interchanges were determined to have vacant land within a ½ mile of the interchange that may be suitable for a potential park-and ride facility. These four locations include: Stirling Road (SR 848), Griffin Road (SR 818), SR 84, and Oakland Park Boulevard (SR 816).

Upon further analysis it was determined that only two of the four locations are conceptually feasible for a multimodal facility including Stirling Road (SR 848) and SR 84. The other two locations present significant challenges which would be considered a fatal flaw.

Figure 5-7 includes the four locations which were analyzed as potential sites for multimodal facilities. The following is a description of each of the four locations and their challenges.

- **Stirling Road (SR 848)** – Stirling Road (SR 848) has accessible vacant property located northwest of the interchange along Stirling Road (SR 848). However, the parcel at the site is privately owned and will require land acquisition. However, this park-and-ride may not be fully utilized since it would be located within a mile of the Sheridan Street park-and-ride which currently operates at 57 percent utilization. Currently only local bus route with low frequency of service exist in the area. The feasibility of providing a stop at this location from the I-95 Express service would need to be evaluated against the potential benefits, including reliability, travel times and additional ridership.

- **Griffin Road (SR 818)** – At the northwest quadrant of the Griffin Road (SR 818) and I-95 interchange, there is FDOT surplus right-of-way. This site would be visible and accessible from I-95 and offers connections to the Hollywood Tri-Rail station located on the south side of Griffin Road (SR 818). However, upon further review this site has a fatal flaw. It is currently being utilized for drainage treatment and the Proposed Alternative proposes to improve the drainage capabilities of this site.

- **SR 84** – At the northwest corner of the SR 84 and I-95 interchange there exists vacant property suitable for a potential park-and-ride lot. This property is currently privately owned and will require land acquisition. While the property is visible from I-95 and SR 84, access may be a challenge with the I-595/I-95/SR 84 Interchange nearby. SR 84 is also currently served by a local bus route with low service frequency.

- **Oakland Park Boulevard (SR 816)** – At the northwest corner of the Oakland Park Boulevard (SR 816) and I-95 interchange, there was a potential site for a multimodal facility. The available property includes land owned by the South Florida Water Management District and Broward County with a functional use for storm water attenuation and drainage. However, upon further review this site has a fatal flaw. It is located in the vicinity of Easterlin Park. Any development at this site would trigger a Section 4(f) evaluation.

As mentioned above, only two of the original four locations were determined to be conceptually feasible for a multimodal facility including the sites by Stirling Road (SR 848) and SR 84. The viability of these potential park-and-ride locations and their proximity to existing park-and-ride facilities at Sheridan Street and Broward Boulevard warrants further consideration to determine whether this type of facility is necessary. In spring of 2012, FDOT’s most recent park-and-ride inventory recorded a utilization rate of 57 percent at Sheridan Street and 48 percent at Broward Boulevard. Furthermore, the entry and exit points of the Express Lane facility need to be considered in terms of accessibility between the Express Lane corridor and the park-and-ride facilities.

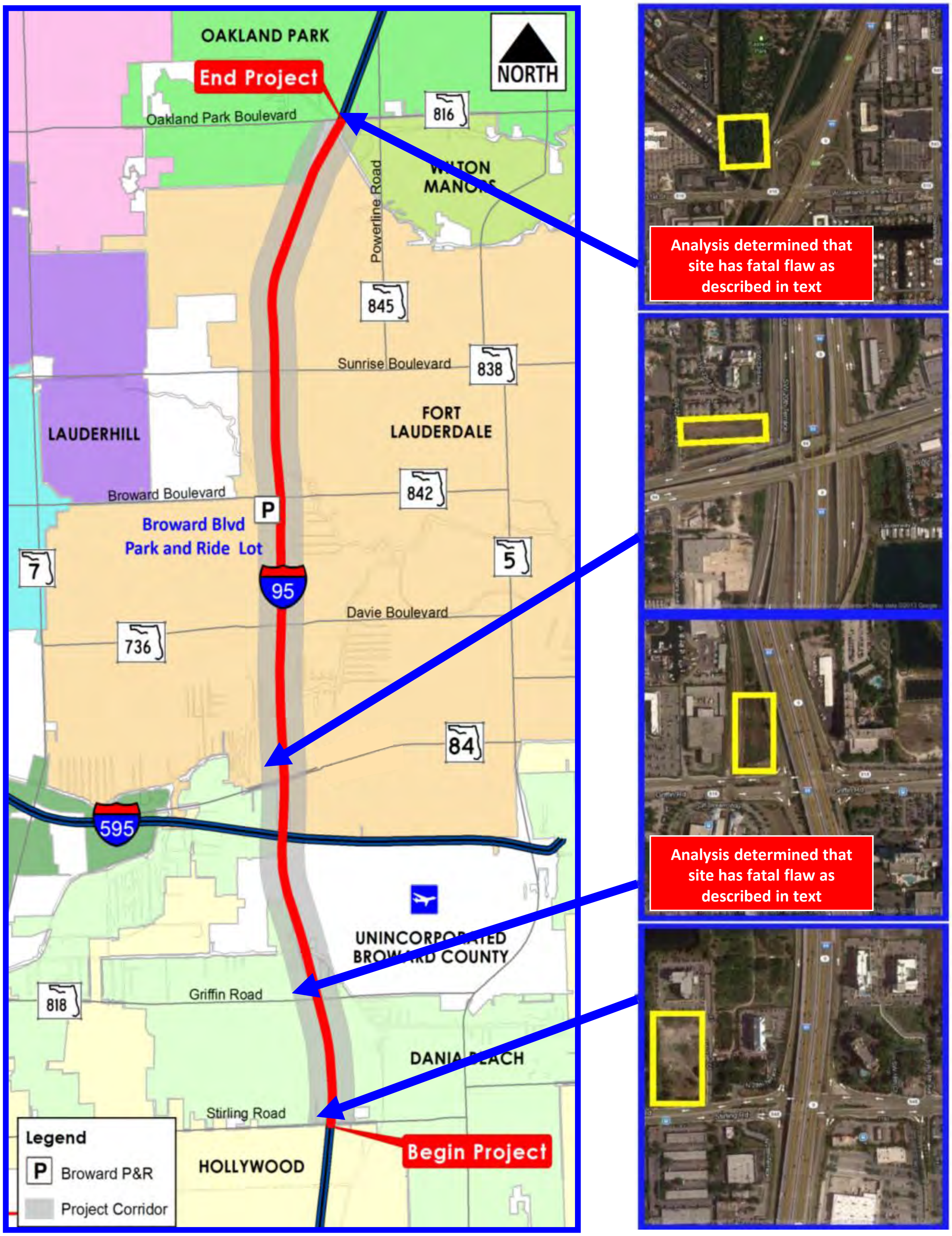


Figure 5-7
Sites Analyzed for Potential Multimodal Facilities

5.3.16 Access Management

I-95 is a limited access facility with an Access Class 1, Area Type 1, under the FDOT Access Management Classification System. The minimum interchange spacing allowed is 1 mile. There are eight interchanges within the project limits. The spacing of seven of the interchanges complies with rule 14.97, the lone exception being the spacing between I-595 and SR 84 (See **Table 5-14**). No access management modifications are proposed under either build alternative.

Table 5-14
Access Classification

Cross Street	Mile post	Current Spacing to Next Interchange (Miles)	Access Classification		Complies with Interchange Spacing?
			I-95	Cross Street	
Stirling Road (SR 848)	5.135	1.0	1	5	Yes
Griffin Road (SR 818)	6.148	1.4	1	5	Yes
Interstate 595	7.519	0.4	1	1	No
SR 84	7.966	1.3	1	3	Yes
Davie Boulevard (SR 736)	9.277	1.0	1	6	Yes
Broward Boulevard (SR 842)	10.258	1.0	1	5	Yes
Sunrise Boulevard (SR 838)	11.294	2.2	1	3	Yes
Oakland Park Boulevard (SR 816)	13.452	0.0	1	5	Yes

5.3.17 Bridge Analysis

A comprehensive analysis of the existing bridge conditions and proposed improvements for each bridge structure was conducted as part of this PD&E study. The findings of this analysis are documented in the **Bridge Analysis Report** on file at FDOT District 4. **Table 5-15** provides a summary of the bridges impacted by the proposed improvements.

<table>
<tr><th colspan="8">Table 5-15
Proposed Bridge Characteristics – Build Alternative 1</th></tr>
<tr><th>#</th><th>Location</th><th>Bridge Numbers</th><th>Existing Bridge Width (ft.)</th><th>Proposed Bridge Width (ft.)</th><th>Min. Vert. Cl. (ft.)</th><th>Bridge Length (ft.)</th><th>Proposed Improvement</th></tr>
<tr><td>3</td><td rowspan="2">I-95 over Griffin Road (SR 818)</td><td>860554 (SB)</td><td>85.625</td><td>100.875</td><td rowspan="2">16.10</td><td rowspan="2">180</td><td>Widening</td></tr>
<tr><td>4</td><td>860555 (NB)</td><td>85.625</td><td>100.875</td><td>Widening</td></tr>
<tr><td>5</td><td rowspan="2">I-95 over Dania Cut-off Canal</td><td>860109 (SB)</td><td>Varies from 88.208 to 91.177</td><td>96.75</td><td rowspan="2">11.33 (MHW)</td><td rowspan="2">180.3</td><td>Widening</td></tr>
<tr><td>6</td><td>860209 (NB)</td><td>96.625</td><td>112.75</td><td>Widening</td></tr>
<tr><td>43</td><td>SB I-95 to Broward Boulevard (SR 842) over North Fork New River</td><td>860260</td><td>51</td><td>Varies from 46.88 to 49.896</td><td>6.89 (MHW)</td><td>155</td><td>Widening</td></tr>
<tr><td>44</td><td rowspan="2">I-95 over North Fork New River</td><td>860270 (SB)</td><td>93.6</td><td>95.08</td><td>6.35 (MHW)</td><td>250</td><td rowspan="2">Widening</td></tr>
<tr><td>45</td><td>860271 (NB)</td><td>88.04</td><td>Varies from 94.08 to 97.042</td><td>7.55 (MHW)</td><td>207</td></tr>
</table>

Table 5-15
Proposed Bridge Characteristics – Build Alternative 1

#	Location	Bridge Numbers	Existing Bridge Width (ft.)	Proposed Bridge Width (ft.)	Min. Vert. Cl. (ft.)	Bridge Length (ft.)	Proposed Improvement
47	I-95 over NW 6 St	860272 (SB)	97.08	Varies from 219.33 to 224.00	16.35	158.6	Widening - bridges to be united
48		860273 (NB)	109.08				
52	I-95 over NW 19 St	860115	98.625	229.083	At least 16.5	142	Replacement
53		860215	98.625				
54	I-95 over C-13 Canal	860116	Varies from 99.719 to 101.594	124.875	6 (MHW)	108	Widening
55		860216	98.708	112.875			Widening
56	I-95 over Oakland Park Boulevard (SR 816)	860117	94.61	112.875	15.05	253.8	Widening
57		860217	94.61	112.875			Widening

Under Build Alternative 1, the following bridges will be widened: Griffin Road (SR 818), Dania Cut-Off Canal, North Fork New River, NW 6th Street, C-13 Canal and Oakland Park Boulevard (SR 816). In addition, the replacement of bridges 860115 and 870215 which carry I-95 over NW 19th Street is recommended because the existing vertical clearance over NW 19th Street is 14.78 ft. and the bridge inventory load rating is 0.83. Per section 7 of the Structures Design Manual a bridge with an inventory rating factor (IRF) below 1.0 shall not be widened unless remedial action is taken to improve the existing condition of the bridge. During the design phase of the project, further analysis of this bridge using refined methods will be required in order to obtain a more precise rating factor.

For the bridge replacement we considered the options of a new single span structure with retaining wall at the front of the end bents versus a three span structure with concrete sloped embankment and similar span arrangements to the existing bridge.

Some of the advantages of a single span bridge include a reduction of the overall length of the bridge by approximately 50 ft. and more importantly avoidance of potential conflicts between the existing and proposed bridge foundations. The proposed bridge will be 142 ft. long. The main disadvantage is that temporary retaining walls will be required for the construction of the end bents and the installation of the MSE walls. It should be noted that the bridge profile will be raised by 3 ft. 9 in. which may result in additional noise impact and require the modification or relocation of the existing sound barrier wall on the south east quadrant. A sample of the new bridge typical section and elevation is depicted in **Figure 5-8** and **Figure 5-9** respectively.

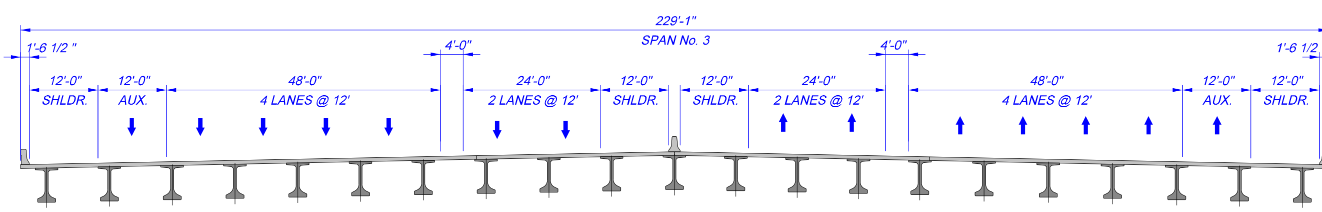


Figure 5-8
Final Bridge Section

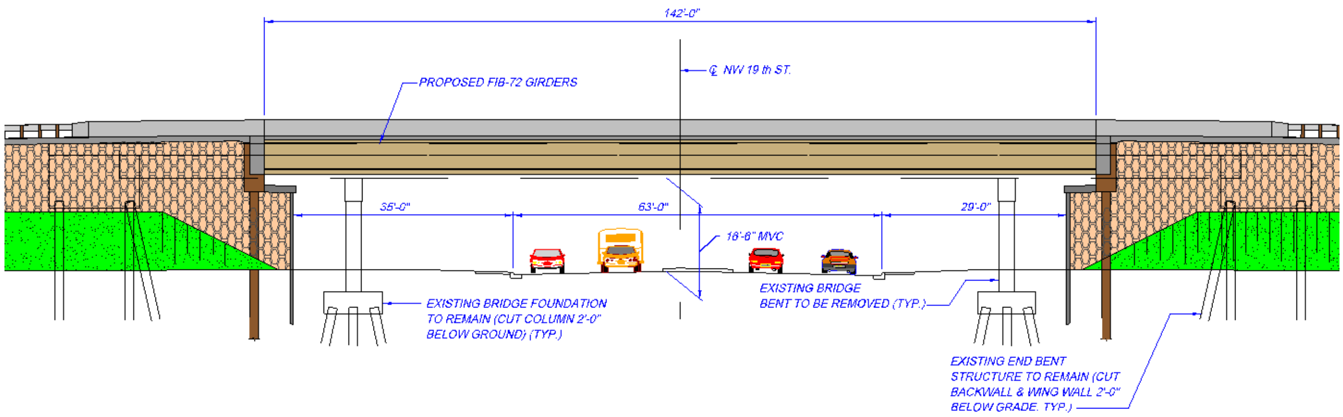


Figure 5-9
NW 19 ST Proposed Bridge Elevation

In addition to the bridges mentioned above in Build Alternative 1, the bridge carrying the northbound CD road over the South Fork New River will be widened under Build Alternative 1A. The widening of this bridge is required to accommodate a wider CD road template in this area resulting in the re-routing of a mainline auxiliary lane onto the CD road.

Most of the bridges being widened have substandard vertical clearances and therefore a shallower Florida I-Beams (FIB) girder type will be proposed in order to maintain the existing vertical clearances. Typically, the superstructure options for the proposed widening are limited to Florida I-Beams (FIB) per Structures Design Guidelines (SDG) section 7.6. On design-build projects, however, AASHTO type beams can be used if approved by the Department. Two or three lines of FIB-36 or FIB-45 will be required on each bridge to accommodate the proposed widening. This is necessary to avoid a large overhang or a tributary spacing for the existing exterior beam and maintain the existing beam spacing. The existing deck will be saw cut along the center line of the exterior beam. The concrete will be removed without damaging the existing reinforcement to allow for a splice of the transverse reinforcement. Because of the close proximity to the signalized intersections east and west of some bridges, it may be necessary to mount some signal heads on these bridges.

In general, the substructure will require the addition of 18 in. or 24 in. SQ prestressed concrete piles in order to extend the existing end bents. One independent hammer head column will be proposed at the intermediate pier. Because of the constraints with the roadway below, the diameter of the proposed columns will be kept at 3 ft. The new columns will require design for Vehicle Collision Forces in accordance with the American Association of State Highway and Transportation Officials (AASHTO) LRFD Section 3.5.6. The existing F shaped barriers along the bride piers will have to be extended to the widened portion. A typical widening schematic is shown in **Figure 5-10**. Refer to the **Bridge Analysis Report** on file at FDOT District 4 for additional information and specific details about each bridge.

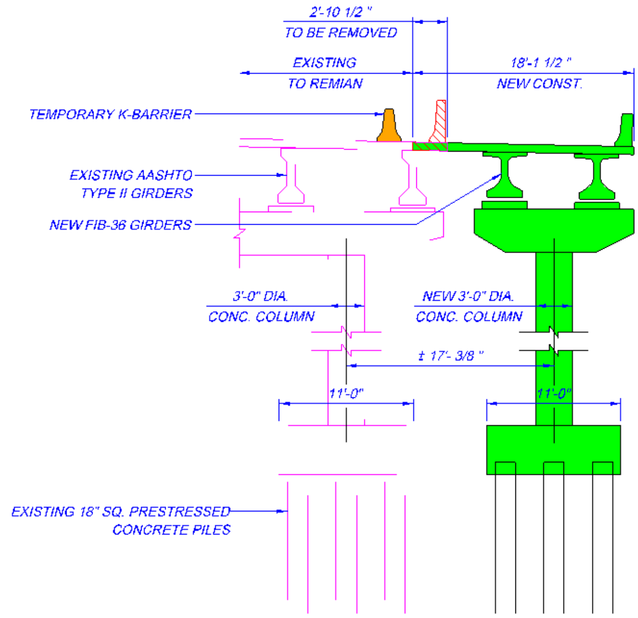


Figure 5-10
NW 19 ST Widening Schematic

Several utilities attached to the existing bridges will require protection and in some cases relocation. At some locations special considerations is required for work near or under the existing overhead power lines.

In addition to bridge structures, a number of retaining walls along the corridor will require modifications and at some locations new walls will be added. Refer to the **Bridge Analysis Report** on file at FDOT District 4 for additional information for specific details about retaining walls.

5.3.18 Design Variations and Exceptions

The following design elements do not comply with the current FDOT Plans Preparation Manual (PPM) but do comply with AASHTO criteria. A design variation is recommended for them:

Shoulder width: Chapter 2, Volume 1 of the FDOT Plans Preparation Manual (PPM), Table 2.3.1 states that the minimum inside and outside shoulder widths on a 4-lane freeway shall be 12 ft. From I-595 to north of the Broward Boulevard Park and Ride Ramp, the shoulder will vary in width. Generally, the inside shoulders will be between 10 ft. and 12 ft. wide and the outside shoulders will be 12 ft. wide. A design variation for shoulder width is required under the Build Alternative.

Bridge Width: Chapter 2, Volume 1 of the FDOT PPM, Figure 2.0.1 states that the outside shoulder on freeway bridges should be 10 ft. and that the inside shoulder should be as wide as that on the approaching roadway. Under Build Alternative 1, the inside shoulder widths on the northbound and southbound bridges over the South Fork New River are reduced to 3 ft. and 4 ft., respectively. The outside shoulders at these bridges are reduced to 8-ft in both directions. Under Build Alternative 1A, the northbound outside shoulder is reduced to 8 ft. and the southbound outside shoulder is reduced to 8 ft. AASHTO states that bridges should be as wide as the approaching roadway. These bridges are part of the constrained section from SR 84 to Davie Boulevard (SR 736), and as such, the approaching roadway width is maintained through the bridges.

Vertical Clearance: As per Table 2.10.1 of the FDOT PPM, the minimum vertical clearance allowed for roadway over roadway is 16.5 ft. Existing vertical clearances over I-95 were field verified and the minimum vertical clearance is not met at five locations. In addition, existing vertical clearances below I-95 were verified with existing plans. Widening of the bridges will not reduce the existing vertical clearances below I-95; however, three locations were identified that do not meet the minimum PPM vertical clearance, including one that does not meet AASHTO criteria. AASHTO, however, states that 14 ft. clearance is allowed in highly developed urban areas if an alternate route can be provided. Sunrise Boulevard, which goes over I-95, is located 2 miles from Oakland Park Boulevard and can serve as alternate route. Deficient vertical clearances along the corridor are detailed in **Table 5-16**. Under the Build Alternative, a design variation for vertical clearance will be required.

Table 5-16
Vertical Clearance Design Variations

Location	Minimum Vertical Clearance (ft.)	PPM (ft.)	AASHTO (ft.)	Variation/ Exception
I-595 EB over I-95 NB	16.43	16.50	16.00	Variation
I-595 WB over I-95 NB	16.43	16.50	16.00	Variation
WB I-595 to SB I-95 over I-95	16.33	16.50	16.00	Variation
PNR #2 to I-95 ramp over I-95 SB	16.02	16.50	16.00	Variation
Sunrise Boulevard (SR 838) over I-95	16.41	16.50	16.00	Variation
I-95 over Griffin Road (SR 818)	16.10	16.50	16.00	Variation
I-95 over NW 6 Street	16.35	16.50	16.00	Variation
I-95 over Oakland Park Boulevard (SR 816)	15.05	16.50	16.00	Variation*

*14 feet allowed in highly developed urban areas if alternate route has 16 feet.

Horizontal Alignment: Chapter 2, Volume 1, of the FDOT PPM, Table 2.8.2a states that horizontal curve length for freeways should be a minimum of 15V, or 975 ft.

Nine horizontal curves do not meet the minimum horizontal length criterion. Under the Build Alternative, these curves would require reconstruction to provide the required length. Consequently, a design variation is required for curve length for these nine curves.

Table 5-17
Design Variation – Horizontal Curve Length

Curve No.	Existing Curve Parameters					PPM/AASTHO Criteria		Variation or Exception
	Baseline	Design Speed (mph)	Radius (ft.)	Superelevation	Length (ft.)	Desirable (ft.)	Minimum (ft.)	
H6	NB & SB	65	11458.060	0.020	835.74	1950	975	Variation
H7	NB & SB	65	11458.690	0.030	682.30	1950	975	Variation
H11	NB	65	10511.000	0.020	786.65	1950	975	Variation
H12	NB	65	10511.000	0.020	560.39	1950	975	Variation
H18	SB	65	4573.00	0.041	678.17	1950	975	Variation
H19	SB	65	5022.00	0.038	484.87	1950	975	Variation
H20	NB & SB	65	11459.560	0.020	751.68	1950	975	Variation
H22	NB & SB	65	5729.620	0.037	947.11	1950	975	Variation
H23	NB & SB	65	5729.590	0.039	946.90	1950	975	Variation

Vertical Alignment: Chapter 2, Volume 1 of the FDOT Plans Preparation Manual (PPM), Table 2.6.2 states that the maximum change in grade without a vertical curve is 0.30% for a design speed of 65. Table 2.8.5 states that the minimum length of a crest curve should be L=KA with a minimum K-Value of 401. Table 2.8.6 states that the minimum length of a sag curve should be L=KA with a minimum K-Value of 181. **Table 5-18** below shows that six vertical crest curves and one vertical sag curve do not meet the minimum K-Value as required by the PPM and will require a design variation. These seven curves would require reconstruction to bring into compliance with the FDOT PPM. **Table 5-19** below shows that seven vertical crest curves and one vertical sag curve do not meet the minimum length as required by the PPM and will require design variations. These eight curves would require reconstruction to bring into compliance with the FDOT PPM. As such, design variations are proposed. Under the existing conditions, the vertical sag curve which meets neither the minimum length nor K-value required by the PPM does not meet AASHTO criteria. Overbuild is proposed to elongate this curve to bring it into compliance with AASHTO criteria.

Stopping Sight Distance: Chapter 2, Volume 1 of the FDOT Plans Preparation Manual (PPM), Table 2.7.1 states that the minimum stopping sight distance allowable on an interstate highway with a 65 mph design speed is 730 ft. As shown in **Table 5-20**, six vertical curves do not meet the FDOT criterion for stopping sight distance. In order for these curves to meet the FDOT requirement for stopping sight distance, reconstruction would be required. As a result, a design variation for stopping sight distance is required under the Build Alternative.

Table 5-18
Design Variation - Grades and K Values

Curve No.	Baseline	Design Speed (mph)	Vertical Curve Type	Grade		Δ G	Existing Curve Length (ft.)	Existing K-Value	Criteria- K Value		Variation or Exception
				Back	Ahead				PPM	AASHTO	
V2	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	401.00	193.00	Variation
V3	NB & SB	65	Sag	Sag curve to be brought to FDOT PPM standards with overbuild							Variation
V6	NB & SB	65	Crest	2.522	2.434	4.956	1500.00	302.66	401.00	193.00	Variation
V9	NB & SB	65	Crest	1.500	0.500	2.000	640.00	320.00	401.00	193.00	Variation
V18	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	401.00	193.00	Variation
V38	SB	65	Crest	2.478	2.007	4.485	1170.00	260.86	401.00	193.00	Variation
V39	NB	65	Crest	2.515	2.023	4.538	1170.00	257.82	401.00	193.00	Variation

Table 5-19
Design Variation - Vertical Curve Length

Curve No.	Baseline	Design Speed (mph)	Vertical Curve Type	Grade		Δ G	Existing Curve Length (ft.)	Existing K-Value	Criteria- Curve Length		Variation or Exception
				Back	Ahead				PPM (ft.)	AASHTO (ft.)	
V3	NB & SB	65	Sag	Sag curve to be brought to FDOT PPM standards with overbuild							Variation
V6	NB & SB	65	Crest	2.522	2.434	4.956	1500.00	302.66	1800.00	956.51	Variation
V9	NB & SB	65	Crest	1.500	0.500	2.000	640.00	320.00	1000.00	386.00	Variation
V13	NB	65	Crest	0.300	0.300	0.600	500.00	833.33	1000.00	115.80	Variation
V14	SB	65	Crest	0.300	0.300	0.600	500.00	833.33	1000.00	115.80	Variation
V16	NB & SB	65	Crest	0.300	0.300	0.600	500.00	833.33	1000.00	115.80	Variation
V38	SB	65	Crest	2.478	2.007	4.485	1170.00	260.86	1800.00	865.62	Variation
V39	NB	65	Crest	2.515	2.023	4.538	1170.00	257.82	1800.00	875.85	Variation

Table 5-20
Design Variation- Vertical Stopping Sight Distance

Curve No.	Baseline	Vertical Curve Type	Grade		Δ G	Existing Curve Length (ft.)	Existing SSD		Criteria - SSD		Variation or Exception
			Back	Ahead			PPM (ft.)	AASHTO (ft.)	PPM (ft.)	AASHTO (ft.)	
V2	NB & SB	Crest	3.000	3.000	6.000	1800.00	631.46	804.67	730.00	645.00	Variation
V6	NB & SB	Crest	2.522	2.434	4.956	1500.00	634.26	808.23	730.00	645.00	Variation
V9	NB & SB	Crest	1.500	0.500	2.000	640.00	652.17	831.06	730.00	645.00	Variation
V18	NB & SB	Crest	3.000	3.000	6.000	1800.00	631.46	804.67	730.00	645.00	Variation
V38	SB	Crest	2.478	2.007	4.485	1170.00	588.84	750.35	730.00	645.00	Variation
V39	NB	Crest	2.515	2.023	4.538	1170.00	585.39	745.95	730.00	645.00	Variation

Horizontal Clearance: Chapter 2, Volume 1 of the FDOT Plans Preparation Manual (PPM), Table 2.11.2 states that conventional light poles should be located no closer than 20 ft. from the mainline or 14 ft. from an auxiliary lane. AASHTO states that light poles should be located outside the clear zone, if on non-breakaway supports. Two existing light poles on breakaway supports are located approximately 8 ft. from the auxiliary lane in the vicinity of the North Woodlawn Cemetery. A design variation for horizontal clearance is being requested to avoid and minimize impacts to this resource. See the **Cultural Resource Assessment Survey** on file at FDOT District 4 for additional information regarding the North Woodlawn Cemetery.

Border Width: Chapter 2, Volume 1 of the FDOT Plans Preparation Manual (PPM), Table 2.5.3, states that the minimum border width for freeways, including interchange ramps, is 94 ft. AASHTO requires a minimum border width of 8 ft. Designing the corridor to accommodate 94 ft. of border as per FDOT standards would require significant right of way acquisition along both sides of the facility. As a result, a border width design variation is required under the Build Alternative. The border width along the corridor is summarized in the **Table 5-21** below:

Table 5-21
Design Variation - Border Width

Location	Left (ft.)		Right (ft.)		PPM (ft.)	AASHTO (ft.)	Variation or Exception
	Min	Max	Min	Max			
Stirling Road (SR 848) to SW 42 Street	9	50	10	42	94	8	Variation
SW 42 Street to I-595	11	147	22	110	94	8	Variation
I-595 to South Fork New River	14	14	21	129	94	8	Variation
South Fork New River to just north of Sistrunk Boulevard	9	88	25	178	94	8	Variation
Just north of Sistrunk Boulevard to Oakland Park Boulevard (SR 816)	36	60	13	101	94	8	Variation

The following design elements meet neither the current FDOT Plans Preparation Manual (PPM) nor AASHTO criteria. A design exception is recommended for them:

Lane width: Chapter 2, Volume 1 of the FDOT Plans Preparation Manual (PPM), Table 2.1.1 states that the minimum lane width on a freeway shall be 12 ft. AASHTO also states that all lanes on a freeway shall be 12 ft. Lane widths for the corridor will vary per segment. From Stirling Road (SR 848) to I-595 and from north of the Broward Boulevard Park and Ride to Oakland Park Boulevard (SR 816) the Express Lanes and the general purpose lanes will be 12 ft.

From I-595 to north of the Broward Boulevard Park and Ride ramp, the Express Lanes will be 11 ft. In addition, there will be one 11 ft. general purpose lane in each direction at the constrained locations where the typical section is reduced. Refer to Attachment B of the 13-Point Concurrency Memorandum located in Appendix C for the constrained typical sections. Consequently, a design exception for lane width is required under the Build Alternative.

Shoulder width: Chapter 2, Volume 1 of the FDOT Plans Preparation Manual (PPM), Table 2.3.1 states that the minimum inside and outside shoulder widths on a 4-lane freeway shall be 12 ft. AASHTO states that all shoulders on a freeway shall be 10 ft. As shown in **Table 5-22**, I-95 features seven constrained locations where the shoulder width is reduced to less than 10 ft. Consequently, a design exception for shoulder width is required under the Build Alternative.

Table 5-22
Design Exception – Shoulder Width

Location	Direction	Shoulder Width (ft.)	
		Outside	Inside
SW 42 Street Underpass	SB	8	3
	NB	8	3
SR 84 Underpass	SB	9	8
	NB	9	8
South Fork New River Bridge	SB	8	4
	NB*	8	3
Davie Boulevard (SR 736) Underpass	SB	8	3
Park and Ride Ramp south of Broward Boulevard	NB	12	7
North Woodlawn Cemetery	SB	12	5
	NB	6	5
Sunrise Boulevard (SR 838) Underpass	SB	15	5
	NB**	8	3

* Build Alternative 1A would feature 8 ft. outside shoulder and 10 ft. inside shoulder.
** Build Alternative 1B would feature 9 ft. outside shoulder and 10 ft. inside shoulder.

Providing a 12 ft. outside shoulder at Sunrise Boulevard (SR 838) would result in a shift of the edge of pavement toward the west. This would require widening I-95 toward the outside and the transition would extend into the constrained section at the North Woodlawn Cemetery. Consequently, the 15 ft. outside shoulder at Sunrise Boulevard (SR 838) cannot be reduced in order to provide additional width for inside shoulder.

The location of the deficient design elements are highlighted in **Figure 5-11**. Refer to the **Appendix C** for the 13-Point Concurrency Memorandum submitted to FHWA.

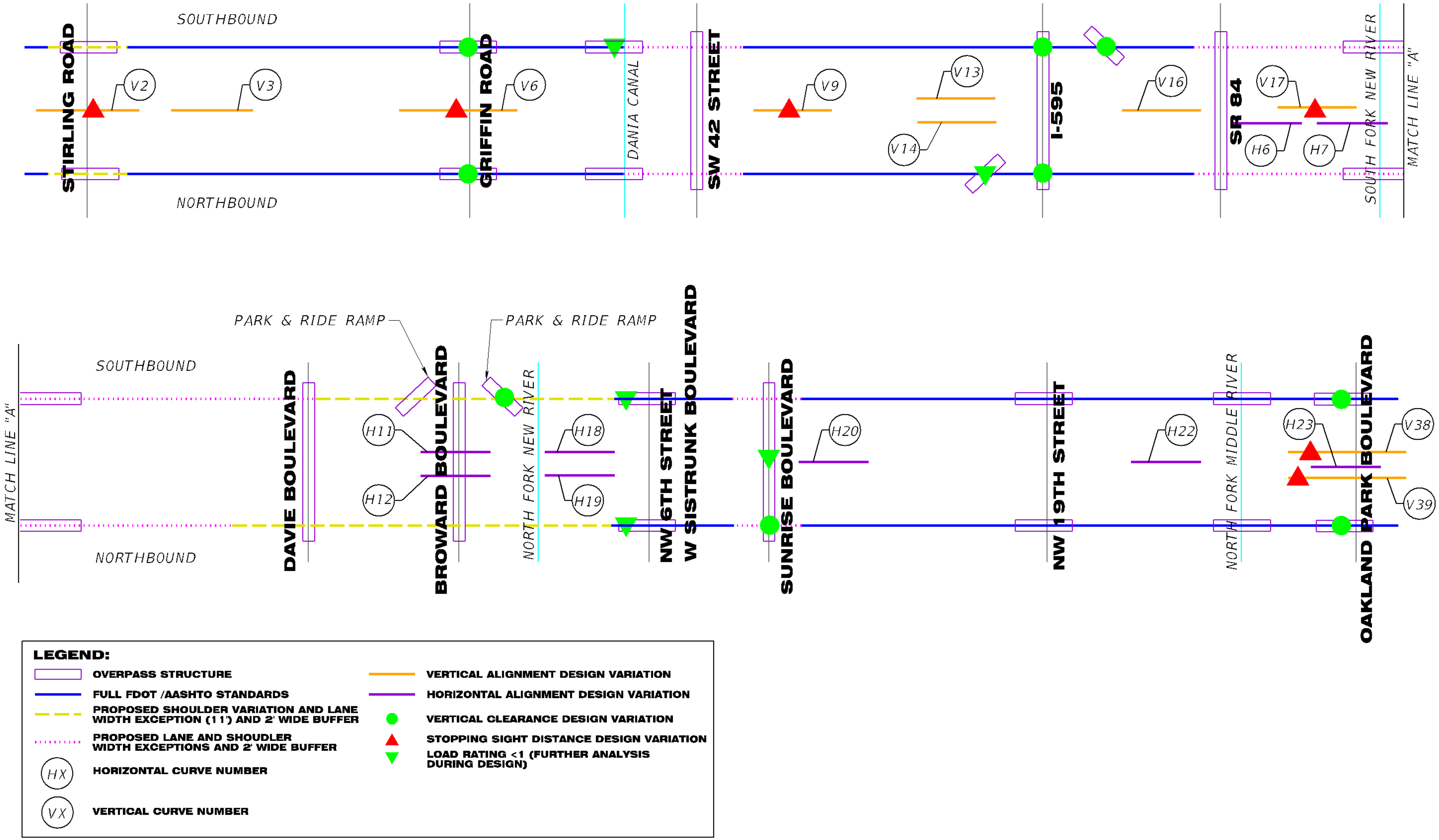


Figure 5-11
Summary of Design Variations and Exceptions

5.3.19 Evaluation Matrix

Evaluation of transportation projects to select the most desirable alternative is often based on a wide range of performance criteria (i.e., traffic operations and safety, environmental impacts, construction costs, drainage impacts, economics, etc.) that reflect the concerns of all the key stakeholders.

Each alternative was evaluated based on these criteria and was given a rating value of 5, 4, 3, 2 or 1 based on the effect (substantially positive, generally positive, generally no effect, generally negative effect or substantially negative effect) the alternative under consideration would have. The various criteria used in the evaluation are summarized in **Table 5-23**.

Table 5-23 **Performance Evaluation Criteria**
Engineering
Geometric Compliance to Design Criteria: Assesses the compliance of the Build alternatives with FDOT design standards and Plans Preparation Manuals (PPM) and the need for variations.
Access Management Issues: This criterion quantifies the ability of an alternative to address access management issues along the project corridor such as interchange spacing.
Multi-modal Issues (Transit /Pedestrian / Bicycle Facilities): Measures the availability of Transit facilities and their amenities and how a particular alternative enhances the ability to promote this form of transportation by providing bus bays and turnouts, shelters and other amenities. Measures the effectiveness of existing and/or proposed bicycle and pedestrian facilities along the corridor to address safety concerns.
Mobility: Measures the ability of an alternative to provide adequate capacity and minimize travel time delay through the corridor and to the various access points within the corridor.
Safety Impacts: Provides consideration for an alternative's physical, geometric and operational features identifying to what extent they would minimize actual or potential safety hazards.
Utility Impacts: Measures the utility impacts of the alternatives. This includes potential conflicts and relocation of the utility lines that are located within FDOT right of way.
Maintenance of Traffic: Measures the effectiveness of the proposed traffic control schemes during construction to minimize effects on the local residents, business, and traveling public and emergency management services.
Meets Purpose and Need: Measures the ability of an alternative to comply with the policies and goals of the County's and City's Comprehensive Development Master Plan (CDMP). Also identifies if an alternative is consistent with the State Transportation Improvement Plan (STIP), Transportation Improvement Program (TIP), MPO's Long Range Transportation Plan (LRTP), and other local plans.
Socio-Economic
Displacements Residential / Business: This criterion identifies the level and type of any residential and/or business disruptions associated with an alternative.
Social & Neighborhood Impacts: This criterion identifies whether an alternative has impacts on social and neighborhood issues, including visual and aesthetic concerns.
Economic & Employment Impacts: This criterion identifies whether an alternative impacts economic

Table 5-23 Performance Evaluation Criteria
issues along the corridor.
Community Services / Features: This criterion measures the effect and/or compatibility of an alternative to meet the surrounding visual environment needs from both the roadway user and the supporting community. Also provides a degree of impact to the communities services (Fire, Police, Parks, etc.).
Public Comments: This criterion incorporates the comments and feedback from the public for each alternative. An Alternatives Public Workshop was held on October 10, 2012. Several community outreach meetings were held and a Public Hearing was held on April 11, 2013. A summary of the public involvement effort is included in this report, Section 6.17
Environmental
Noise Impacts: Measures the ability of an alternative to meet pre-established noise standards.
Air Quality: Measures the ability of an alternative to meet pre-established air quality standards.
Contamination: Measures the potential impact on existing or potential hazardous material sites and or generators.
Biological / Wetland Impacts: Identifies the degree of potential effect on Threatened and Endangered Species and potential impacts to wetland habitat.
Water Quality: Measures the alternative's potential effect on water quality for any surface or subsurface water resource within the project limits.
Cultural / Historic / Archaeological: Measures the degree of impact associated with historic structures or archaeological sites that may be caused by the development of a specific corridor or concept.
Project Cost
Engineering: Compares each alternative based on design costs.
Construction: Compares each alternative based on construction costs.
Right of way/Business Damages: Addresses variations in right of way costs between alternatives.

The evaluation methodology used in this study involves a two-step process using both comparative (qualitative) and multi-criteria (quantitative) analyses to determine the Recommended Alternative. These results are presented in **Table 5-24** and in **Figure 5-12.**

Table 5-24
Evaluation Matrix - Qualitative Comparison

	VARIABLES	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 1	BUILD ALTERNATIVE 1A	BUILD ALTERNATIVE 1B
ENGINEERING	**Geometric Compliance to Design Criteria**	The No Build Alternative has similar deficiencies as both Build Alternatives. However, the Build Alternative would allow you to improve some of these deficiencies.	Variations: Border Width, Vertical Clearance, Horizontal Curve Length, Vertical Alignment, Stopping Sight Distance, Exceptions: Vertical Clearance, lane width, shoulder width (in reduced and constrained typical sections), horizontal clearance,	Variations: Border Width, Vertical Clearance, Horizontal Curve Length, Vertical Alignment, Stopping Sight Distance, Exceptions: Vertical Clearance, lane width, shoulder width (in reduced and constrained typical sections), horizontal clearance,	Variations: Border Width, Vertical Clearance, Horizontal Curve Length, Vertical Alignment, Stopping Sight Distance, Exceptions: Vertical Clearance, lane width, shoulder width (in reduced and constrained typical sections), horizontal clearance,
	Access Management	No access management modifications proposed	No access management modifications proposed	No access management modifications proposed	No access management modifications proposed
	Multimodal Issues/ Transit	No impact	Provides ability to incorporate regional express bus service	Provides ability to incorporate regional express bus service	Provides ability to incorporate regional express bus service
	Mobility	Increased congestion	Added capacity with Express Lanes and travel time reliability. Improved operation of General Purpose Lanes	Added capacity with Express Lanes and travel time reliability. Improved operation of General Purpose Lanes	Added capacity with Express Lanes and travel time reliability. Improved operation of General Purpose Lanes
	Safety Impacts	No safety improvements	Additional capacity will likely improve safety.	Additional capacity will likely improve safety	Additional capacity will likely improve safety
	Utility Impacts	No impacts	Moderate impacts at interchanges and I-95 mainline bridges	Moderate impacts at interchanges and I-95 mainline bridges	Moderate impacts at interchanges and I-95 mainline bridges
	Maintenance of Traffic	No construction, no traffic disruption and no impacts	moderate impacts during construction	Build Alternative 1A requires widening of northbound CD road bridge which will result in greater MOT impacts than Build Alternative 1.	Build Alternative 1B requires construction underneath the Sunrise Boulevard overpass and will also result in slightly greater MOT impacts than Build Alternative 1.
	Purpose and Need	Does not meets Purpose and Need	Meets Purpose and Need	Meets Purpose and Need	Meets Purpose and Need
SOCIO-ECONOMIC	**Displacement of Residences & Businesses**	None	No right of way acquisition for off-sit ponds and roadway improvements. No corner clips necessary to improve ramps at Stirling Rd. and Griffin Rd.	No right of way acquisition for off-sit ponds and roadway improvements. No corner clips necessary to improve ramps at Stirling Rd. and Griffin Rd.	No right of way acquisition for off-sit ponds and roadway improvements. No corner clips necessary to improve ramps at Stirling Rd. and Griffin Rd.
	Social & Neighborhood Impacts	None	Provides ability to incorporate regional express bus service which offers an alternative to auto travel and addresses needs of low-income users and disadvantage groups.	Provides ability to incorporate regional express bus service which offers an alternative to auto travel and addresses needs of low-income users and disadvantage groups.	Provides ability to incorporate regional express bus service which offers an alternative to auto travel and addresses needs of low-income users and disadvantage groups.
	Economic & Employment Impacts	No impacts	Improved mobility, throughput, travel speeds and travel time reliability for this important SIS facility supports economic development. Reduced congestion improves access to businesses, freight activity centers, local distribution facilities and freight corridors	Improved mobility, throughput, travel speeds and travel time reliability for this important SIS facility supports economic development. Reduced congestion improves access to businesses, freight activity centers, local distribution facilities and freight corridors	Improved mobility, throughput, travel speeds and travel time reliability for this important SIS facility supports economic development. Reduced congestion improves access to businesses, freight activity centers, local distribution facilities and freight corridors
	Community Services / Features	No impacts	No impacts	No impacts	No impacts

Table 5-24
Evaluation Matrix - Qualitative Comparison

	VARIABLES	NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE 1	BUILD ALTERNATIVE 1A	BUILD ALTERNATIVE 1B
	Public Comments	Public generally understands the need for improvements to I-95.	Generally in favor	Generally in favor	Generally in favor
ENVIRONMENT	**Noise Impact**	No Effect, but no ability to add noise abatement	Noise impacts identified at 13 areas, noise barrier found reasonable for 1 area.	Noise impacts identified at 13 areas, noise barrier found reasonable for 1 area.	Noise impacts identified at 13 areas, noise barrier found reasonable for 1 area.
ENVIRONMENT	**Air Quality**	Potential impact from increased congestion	Air quality analysis shows no adverse impact from project	Air quality analysis shows no adverse impact from project	Air quality analysis shows no adverse impact from project
ENVIRONMENT	**Contamination**	No Impacts	Potential impact due to work adjacent to construction, including drainage, adjacent to high and medium risk sites	Potential impact due to work adjacent to construction, including drainage, adjacent to high and medium risk sites	Potential impact due to work adjacent to construction, including drainage, adjacent to high and medium risk sites
ENVIRONMENT	**Biological / Wetland Impacts**	No impacts	Stormwater Swale with hydrophytic vegetation - 1.60 acres of direct impact/0.57 acres of indirect impact; "other surface waters" - 1.51 acres of direct impact/0.81 acres of indirect impact (includes mangrove fringe impact)	Greater impacts to mangrove fringe (other surface waters)	Greater direct wetland impact; greater impacts to "other surface waters"
ENVIRONMENT	**Water Quality**	No Impacts	Equivalent water quality treatment will be provided	Equivalent water quality treatment will be provided	Equivalent water quality treatment will be provided
ENVIRONMENT	**Cultural / Historic / Archaeological**	No impacts	Historic resources will be avoided	Historic resources will be avoided	Historic resources will be avoided
COST	**Engineering, CEI & Construction**	No construction, no cost involved ($ 0)	$84,496,165.00 – However, tolling option provides a revenue source to pay for improvements and maintain the system	$ 94,800,000.00 - However, tolling option provides a revenue source to pay for improvements and maintain the system	$85,200,000.00 - However, tolling option provides a revenue source to pay for improvements and maintain the system
COST	**Right of Way- Business Damages**	No R/W acquisition or business damages , no cost involved ($0)	No right of way acquisition to develop improvements	No right of way acquisition to develop improvements	No right of way acquisition to develop improvements

Note :Engineering Cost includes 8% for design
and 6% for CEI

PROJECT DEVELOPMENT AND ENVIRONMENT STUDY FOR I-95
FROM STIRLING ROAD (SR 848) TO OAKLAND PARK BOULEVARD (SR 816)

LEGEND

- 5 SUBSTANTIAL POSITIVE EFFECT OR BEST ALTERNATIVE
- 4 GENERALLY POSITIVE EFFECT OR GOOD ALTERNATIVE
- 3 GENERALLY NO EFFECT OR MODERATE ALTERNATIVE
- 2 GENERALLY NEGATIVE EFFECT OR INFERIOR ALTERNATIVE
- 1 SUBSTANTIAL NEGATIVE EFFECT OR WORST ALTERNATIVE

ALTERNATIVES	Engineering								Socio-Economic					Environment						Cost		SCORE	RANK
	Geometric Compliance to Design Criteria	Access Management	Multimodal Issues (Transit/Pedestrian/Bicycle)	Mobility	Safety Impacts	Utility Impacts	Maintenance of Traffic	Meets Purpose & Need	Displacements Residential / Businesses	Social & Neighborhood Impacts	Economic & Employment Impacts	Community Services / Features	Public Comments	Noise Impact	Air Quality	Contamination	Biological / Wetland Impacts	Water Quality	Cultural / Historic / Archaeological	Engineering, CEI & Construction	Right of Way / Business Damages		
No Build	4	3	2	1	2	5	5	1	5	2	2	3	2	3	2	3	3	2	3	5	5	63	4
Build Alternative 1	3	3	5	5	4	3	2	5	5	3	3	3	4	3	3	2	3	3	3	4	5	74	1
Build Alternative 1A	3	3	5	4	4	3	2	5	5	3	3	3	4	3	3	2	2	3	3	3	2	68	3
Build Alternative 1B	3	3	5	4	4	3	2	5	5	3	3	3	4	3	3	2	2	3	3	3	5	71	2

Figure 5-12
Alternatives Evaluation Matrix

5.4 Recommended Alternative

Based on the Alternative Alignment Analysis, public input from the Alternatives Public Workshop held on Wednesday, October 10, 2012 and the Public Hearing held on April 11, 2013 and the evaluation results summarized in the Evaluation Matrix, Build Alternative 1 is selected as the Recommended Alternative. This alternative meets the purpose and need of the project. The proposed improvements under this alternative achieve the objectives of the department to maximize long-term capacity needs, long-term mobility needs, travel reliability and travel options for drivers within the project study area while minimizing cost and environmental and socio-economic impacts.

6.0 RECOMMENDED ALTERNATIVE

The Recommended Alternative consists of two tolled Express Lanes, separated from the general purpose lanes by tubular markers, and maintains the same number of general purpose and auxiliary lanes. It includes a combination of several typical section configurations: Standard Typical Section, Reduced Typical Section and Constrained Typical Section. They are as detailed in the following sections.

Standard Typical Section:

The standard typical section can be provided from Stirling Road (SR 848, M.P. 5.135) to I-595 (M.P. 7.555) and from north of the Broward Boulevard Park and Ride Ramp (M.P. 10.585) to Oakland Park Boulevard (SR 816, M.P. 13.742). It provides 12 ft. wide travel lanes, inside and outside shoulders, and a 4 ft. buffer between the Express Lanes and the general purpose lanes. See **Figure 6-1**.

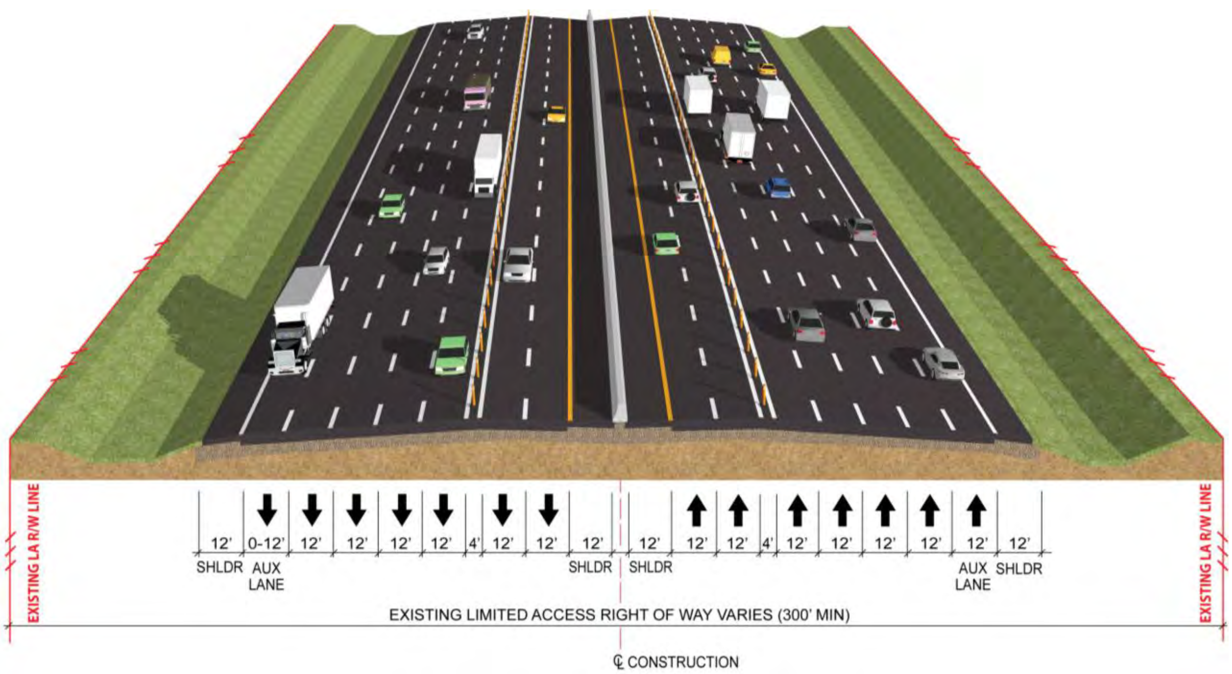


Figure 6-1 Standard Typical Section from Stirling Road (SR 848, M.P. 5.135) to I-595 (M.P. 7.555) and from North of the Broward Boulevard Park and Ride Ramp (M.P. 10.585) to Oakland Park Boulevard (SR 816, M.P. 13.742)

Reduced Typical Section:

Two different reduced typical sections are provided between I-595 (M.P. 7.555) and north of the Broward Boulevard Park and Ride Ramp (M.P. 10.585) as depicted in **Figure 6-2** and **Figure 6-3**, where the Standard Typical Section would require the reconstruction of interchanges or overpasses or would have substantial impacts on existing resources. These configurations feature 11 ft. wide Express Lanes, 12 ft. general purpose lanes and a 2 ft. buffer between the Express Lanes and general purpose lanes. The inside shoulders are 10 ft. for Reduced Typical Section 1 and 12 ft. for Reduced Typical Section 2.

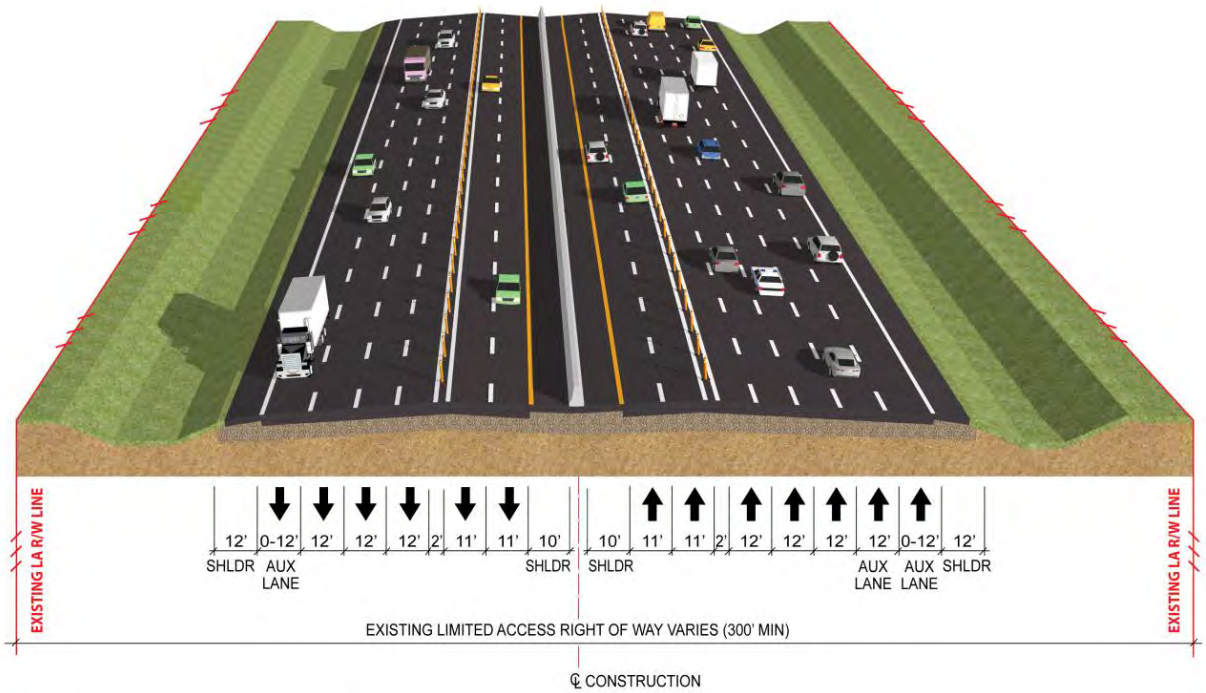


Figure 6-2 Reduced Typical Section 1
from I-595 (M.P. 7.555) to South of the Broward Boulevard Park and Ride Ramp (M.P. 9.738)

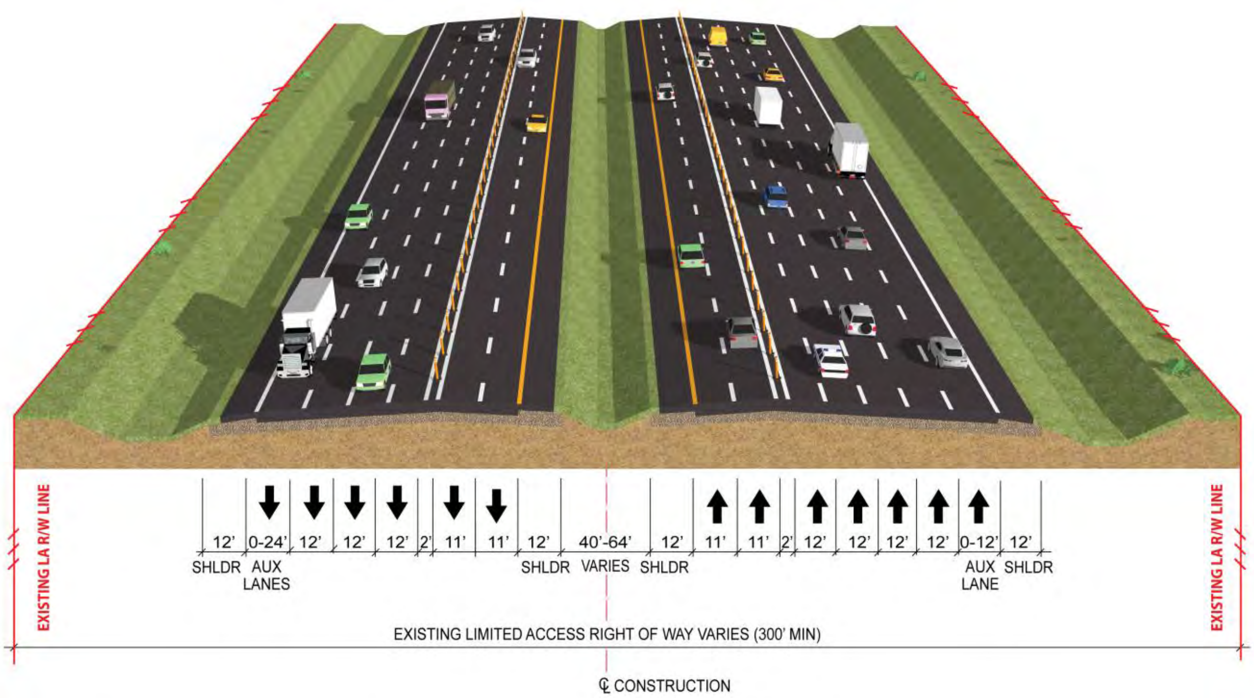


Figure 6-3 Reduced Typical Section 2
from South of the Broward Boulevard Park and Ride Ramp (M.P. 9.738) to North of the Broward Boulevard Park and Ride Ramp (M.P. 10.585)

Constrained Typical Section:
Within the corridor, there are also pinch points where a constrained typical section is required. Some of these pinch points occur underneath the bridges at SW 42 Street, SR 84, Davie Boulevard (SR 736) and Sunrise Boulevard (SR 838). Other locations include: adjacent to the North Woodlawn Cemetery and along the South Fork New River bridges. The alignment for Build Alternative 1 was designed to avoid impacting these resources and the aforementioned bridges by providing a similar lane configuration as the reduced typical section plus narrower shoulders. A summary of these shoulders is presented in **Table 6-1**.

Table 6-1
Typical Sections at Constrained Locations

Location	Direction	Shoulder Width		Auxiliary Lane (ft.)	Number of General Purpose Lanes	Total Width (ft.)#	Length of Reduced Section (ft.)
		Outside (ft.)	Inside (ft.)				
SW 42 Street Underpass	SB	8	3	12	4	94	1840
	NB	8	3	12	4	94	1650
SR 84 Underpass	SB	9	8	0	3	76	8000*
	NB	9	8	0	3	76	6300**
South Fork New River Bridge	SB	4	8	0	3	72	8000*
	NB	3	8	24	3	94	6300**
Davie Boulevard (SR 736) Underpass	SB	8	3	12	3	88	8000*
	NB	12	11	15	3	122	Not constrained
Park and Ride Ramp south of Broward Boulevard (SR 842)	SB	10	10	24	3	103	Not constrained
	NB	12	7	12	4	102	1200
North Woodlawn Cemetery	SB	12	5	0	4	88	2200***
	NB	6	5	24	4	106	1900****
Sunrise Boulevard (SR 838) Underpass	SB	15	5	0	4	94	2200***
	NB	8	3	12	4	94	1900****

*Southbound SR 84, South Fork New River, and Davie Boulevard are one continuous constrained section for 8000 ft.
**Northbound SR 84 and South Fork New River are one continuous constrained section for 6300 ft.
***Southbound North Woodlawn Cemetery and Sunrise Boulevard are one continuous constrained section for 2000 ft.
****Northbound North Woodlawn Cemetery and Sunrise Boulevard are one continuous constrained section for 2000 ft.

Details of the Recommended Alternative are discussed in the subsequent sections.

6.1 Design Details of Recommended Alternative

6.1.1 Typical Section Package

The Typical Section Package is included in **Appendix D**.

6.1.2 Intersection Concepts and Signal Analysis

No intersections or ramp improvements are proposed as part of this project. The additional turn lanes evaluated for the Stirling Road and Griffin Road off ramp terminals under the TSM Section will be considered for implementation under the Districtwide PD&E Project Traffic Interchange Analysis project for Broward County (42598023201 & 42598022201) advertised on April 1st, 2013.

6.1.3 Horizontal Alignment

The improvements for the Recommended Alternative can all be attained by widening the facility, resulting in a proposed horizontal alignment that generally follows the alignment of the existing facility. The one area where the alignment will vary slightly from the existing is in the vicinity of the Broward Boulevard (SR 842) interchange. This area includes ramps from Broward Boulevard (SR 842), Davie Boulevard (SR 736), and from the park and ride lots. The park and ride ramps merge into the Express Lanes. In the existing horizontal alignment, a total of 12 horizontal curves do not meet the minimum curve length requirement. However, in the Recommended Alternative three of the deficient curves were combined and the length of curve now meets the minimum length requirement. The remaining nine deficient curves would require reconstruction to upgrade their lengths and as such, a design variation will be required. There are no existing or proposed horizontal sight distance deficiencies along the corridor. The horizontal alignment is summarized in **Table 6-2** below.

Table 6-2
Proposed Horizontal Alignment – Recommended Alternative

Curve No.	Curve Parameters					
	Baseline	Design Speed (mph)	Radius (ft.)	Superelevation	Length (ft.)	Sight Distance (ft.)
H1	NB & SB	65	5779.600	0.033	1,078.07	874
H2	NB & SB	65	5779.570	0.033	1,064.86	874
H3	NB & SB	65	28647.890	0.020	2,003.86	1623
H4	NB & SB	65	5729.570	0.033	2,294.27	870
H5	NB & SB	65	28648.13	0.020	2,333.52	1945
H6	NB & SB	65	11458.060	0.020	835.74	1027
H7	NB & SB	65	11458.690	0.030	682.30	1027
H8	NB & SB	65	22918.350	0.020	1,982.45	1452
H9	NB	65	22929.00	0.02	2,073.86	1452
H10	NB	65	23988.00	0.02	975.02	1486
H11	NB	65	10511.00	0.02	786.65	1178

Table 6-2
Proposed Horizontal Alignment – Recommended Alternative

Curve No.	Curve Parameters					
	Baseline	Design Speed (mph)	Radius (ft.)	Superelevation	Length (ft.)	Sight Distance (ft.)
H12	NB	65	10511.00	0.020	560.39	983
H13	NB	65	11989.00	0.020	1,426.11	1258
H14	SB	65	15048.00	0.02	1,873.05	1409
H15	SB	Curves H15 and H16 combined with curve H14				
H16	SB					
H17	SB	65	9009.00	0.021	1,199.91	910
H18	SB	65	4573.00	0.041	678.17	1210
H19	SB	65	5022.00	0.038	484.87	1300
H20	NB & SB	65	11459.560	0.020	751.68	1230
H21	NB & SB	65	4583.660	0.047	2,053.46	778
H22	NB & SB	65	5729.620	0.037	947.11	870
H23	NB & SB	65	5729.590	0.039	946.90	870

6.1.4 Vertical Alignment

The Recommended Alternative features only minor modifications to the vertical alignment. An analysis of the existing vertical alignment revealed that one sag curve does not currently meet the minimum vertical curve length required by AASHTO and would require a design exception for vertical curve length. It is anticipated that this curve can be elongated with overbuild to meet the AASHTO requirement. A design variation would still be required for this curve. In addition, 11 sag curves do not currently meet the minimum vertical curve length required by FDOT. It is anticipated that these curves can be elongated with overbuild to meet the FDOT requirement. No design variation would be required for these 11 sag curves. Vertical alignment for the Recommended Alternative was not included in the scope of the study and as a result, Digital Terrain Modeling was not made available to further analyze the vertical alignment. These improvements should be further explored during the next phase of the project.

6.1.5 Design Variations and Exceptions

The roadway improvements proposed under the Recommended Alternative can all implemented by widening the roadway. No reconstruction is proposed. As a result, seven design variations and two design exceptions are being requested as part of this study, as detailed in **Section 5.3.19** and summarized in **Table 6-3**. A copy of the design variations and exceptions is included in **Appendix E**

Table 6-3
Design Variation and Exception Summary

Design Compliance	Design Element	Location/Description
Design Exceptions	Lane Width	11-ft. Express lanes throughout the project and one 11-ft. general purpose lane at the constrained locations.
	Shoulder Width	The shoulder width varies from 3 ft. to 9 ft. at the following locations: -SW 42 Street -SR 84 -South Fork New River -Davie Boulevard (SR 736) -NB at Park and Ride Ramp south of Broward Boulevard -North Woodlawn Cemetery -Sunrise Boulevard (SR 838)
Design Variations	Horizontal Clearance	Two existing light poles on breakaway supports are located approximately 8 ft. from the auxiliary lane in the vicinity of the North Woodlawn Cemetery.
	Bridge Width	Bridge No. 860430 and Bridge No. 860431 over the South Fork New River
	Vertical Clearance	I-595 EB over the I-95 NB lanes measures 16.43 ft. I-595 EB over the I-95 NB lanes measures 16.43 ft. I-595 WB to I-95 SB over the I-95 SB lanes measures 16.33 ft. Park and Ride ramp north of Broward Boulevard over the I-95 SB lanes measures 16.02 ft. Sunrise Boulevard (SR 838) over the I-95 NB lanes measures 16.41 ft. I-95 over Griffin Road (SR 818) measures 16.10 ft. I-95 over NW 6th Street measures 16.35 ft. I-95 clearance over Oakland Park Boulevard (SR 816) is 15.05 ft. (See Note *)
	Horizontal Alignment	Nine curves do not meet the minimum length requirement as per PPM
	Vertical Alignment	Seven curves do not meet the minimum K-Value requirement. Eight curves do not meet the minimum length requirement.
	Stopping Sight Distance	Six curves do not meet the minimum stopping sight distance requirement.
	Shoulder Width	From I-595 to North of the Broward Boulevard Park and Ride Ramp (M.P. 10.585) the inside shoulders vary from 10-ft to 12 ft.
	Border Width	Border width varies throughout the corridor from 9 ft. to 178 ft.

* 14 feet allowed in highly developed urban areas if alternate route has 16 feet.

6.2 Design Traffic

The design traffic was forecasted for the years 2020, 2030, and 2040 to evaluate the future conditions with the No-Build and Build Alternative. The design traffic was developed by utilizing the I-95 Corridor Planning Study (CPS) model. This model was created by performing several enhancements to the Southeast Regional Planning Model (SERPM) 6.5 including adjustments, validation, calibration, and reasonableness checks.

A design traffic operational analysis was conducted to evaluate the performance of the mainline under the No-Build and Build conditions. This includes the mainline freeway segment, weaving sections, off/on ramps, and signalized intersections at the ramp terminals. The **Future Conditions Traffic Operational Analysis** on file with the FDOT District 4 provides details of the traffic operation of the facility. The following sections summarize the future (2040) Annual Average Daily Traffic (AADT) and peak hour volumes, freeway segment analysis, and intersection operations.

Interchange deficiencies discussed in the traffic report will be addressed as part of the I-95 Interchange Master Plan for Broward County in the Department's work program.

6.2.1 Future AADT and Peak Hour Volumes

The 2040 Design Traffic volumes for the Build Alternative during the morning and evening peak periods along the major mainline segments are summarized in **Table 6-4**. Refer to **Appendix F** for more details on the traffic volumes.

Table 6-4
Build Alternative Design Year (2040) Traffic Volumes

Segment	General Purpose Lanes (incl. Auxiliary lanes)			Express Lanes		
	AADT (vpd)	Peak Period Traffic Volume (vph)		AADT (vpd)	Peak Period Traffic Volume (vph)	
		AM	PM		AM	PM
Northbound						
From Sheridan Street (SR 822) to Stirling Road (SR 848)	158,000	9,031	9,347	41,000	3,941	3,758
From Stirling Road (SR 848) to Griffin Road (SR 818)	173,000	9,989	10,352	29,500	3,079	2,822
From Griffin Road (SR 818) to I-595	174,000	10,236	10,678	29,500	3,079	2,822
From I-595 to Davie Boulevard (SR 736)	120,000	6,708	7,581	29,500	3,079	2,822
From Davie Boulevard (SR 736) to Broward Boulevard (SR 842)	158,000	8,726	8,937	19,000	2,211	1,979
From Broward Boulevard (SR 842) to Sunrise Boulevard (SR 838)	176,000	10,279	10,600	31,000	3,495	2,892
From Sunrise Boulevard (SR 838) to Oakland Park Boulevard (SR 816)	165,000	9,731	9,665	31,000	3,495	2,892
From Oakland Park Boulevard (SR 816) to Commercial Boulevard (SR 870)	142,000	8,137	7,830	31,000	3,495	2,892
Southbound						
From Commercial Boulevard (SR 870) to Oakland Park Boulevard (SR 816)	132,000	8,018	8,334	22,000	1,667	2,644
From Oakland Park Boulevard (SR 816) to Sunrise Boulevard (SR 838)	145,000	8,671	9,390	31,500	2,374	3,443
From Sunrise Boulevard (SR 838) to Broward Boulevard (SR 842)	153,000	9,182	9,665	31,500	2,374	3,443
From Broward Boulevard (SR 842) to Davie Boulevard (SR 736)	136,000	7,787	8,302	20,500	1,504	2,154
From Davie Boulevard (SR 736) to I-595	111,000	6,018	6,491	32,500	2,277	3,082
From I-595 to Griffin Road (SR 818)	148,000	7,942	8,751	32,500	2,277	3,082
From Griffin Road (SR 818) to Stirling Road (SR 848)	160,000	9,085	10,108	32,500	2,277	3,082
From Stirling Road (SR 848) to Sheridan Street (SR 822)	145,000	8,080	9,386	47,500	3,314	3,938

vpd: vehicles per day, vph: vehicles per hour
Source: Appendix F of the Corridor Design Traffic Report, on file at FDOT District 4.

6.2.2 Analysis of Future Conditions

The performance of the project corridor under the design year (2040) traffic conditions was evaluated using several measures of effectiveness, some of which are briefly described in the following sections. For more details, refer to the **Corridor Design Traffic Report** on file at FDOT District 4.

6.2.2.1 Freeway Segment Analysis of General Purpose Lanes

Basic freeway segments, on/off ramps, and weaving segments for the No-Build and Build Alternative were analyzed for the AM and PM peak hours using Highway Capacity Software (HCS). **Table 6-5** through **Table 6-8** present a comparative analysis between the 2040 No-Build (general purpose lanes and HOV lane) and 2040 Build Alternative (general purpose lanes only) using the following measures of effectiveness: density (passenger cars/minute/lane) and LOS. Based on this analysis, it can be concluded that the performance measures of most of the basic freeway segments have either remained the same or improved from the No-Build to the Build Alternative during both AM and PM peak hours in both directions. Additionally, most of the basic freeway segments of the Build Alternative are operating at an acceptable LOS. Below are some of the key points of the basic freeway segments from the analysis:

- **Table 6-5 Northbound AM Peak Hour - Future 2040 Freeway Segment Analysis:** Most of the basic freeway segments operate at an acceptable LOS between D and E. The basic freeway segment between NB I-95 off-ramp to Sunrise Boulevard (SR 838) WB and NB I-95 on-ramp from Sunrise Boulevard (SR 838) improves from LOS F in the No-Build Alternative to LOS D in the Build Alternative.

- **Table 6-6 Northbound PM Peak Hour - Future 2040 Freeway Segment Analysis:** Most of the basic freeway segments operate at an acceptable LOS between D and E. Additionally, the segment between NB I-95 on-ramp from Sunrise Boulevard (SR 838) and NB I-95 off-ramp to Oakland Park Boulevard (SR 816) improves from LOS E in the No-Build alternative to LOS D in the Build Alternative.

- **Table 6-7 Southbound AM Peak Hour – Future 2040 Freeway Segment Analysis:** All of the basic freeway segments operate at an acceptable LOS from C to D. Note that the segment between SB I-95 on-ramp from Oakland Park Boulevard (SR 816) EB and SB I-95 off-ramp to Sunrise Boulevard (SR 838) improve from LOS D in the No-Build alternative to LOS C in the Build alternative.

- **Table 6-8 Southbound PM Peak Hour – Future 2040 Freeway Segment Analysis:** Most of the basic freeway segments operate at an acceptable LOS between D and E. Also, the segment between SB I-95 off-ramp to Stirling Road (SR 848) and SB I-95 off- ramp to Express Lane improve from LOS E in the No-Build alternative to LOS D in the Build Alternative.

Table 6-5
Northbound AM Peak Hour - Future 2040 Freeway Segments Analysis

Location	Type	Density (pc/min/ln)		LOS	
		No-Build	Build	No-Build	Build
Between southern end and NB I-95 off-ramp to Stirling Road (SR 848)	basic	42.7	40.0	E	E
NB I-95 off-ramp to Stirling Road (SR 848)	off-ramp	37.5	32.5	E	D
NB I-95 on-ramp from Express Lane (left)	on-ramp	37.1	34.2	F	D
Between NB I-95 on-ramp from Express Lane (left) and NB I-95 on-ramp from Stirling Road (SR 848)	basic	29.0	45.0	D	E
Between NB I-95 on-ramp from Stirling Road (SR 848) and NB I-95 off-ramp to Griffin Road (SR 818)	weaving	40.7	38.6	E	E
Between NB I-95 off-ramp to Griffin Road (SR 818) and NB I-95 on- ramp from Griffin Road (SR 818)	basic	32.4	45.0	D	E
Between NB I-95 on-ramp from Griffin Road (SR 818) and NB I-95 off-ramp to I-595	weaving	49.0	49.3	F	F
Between NB I-95 off-ramp to I-595 and NB I-95 off-ramp to SR-84	basic	26.1	26.1	D	D
NB I-95 off-ramp to SR-84	off-ramp	40.9	39.0	F	E
Between NB I-95 off-ramp to SR-84 and NB I-95 on- ramp from SR-84	basic	27.4	45.0	D	F
Between NB I-95 on-ramp from SR-84 and NB I-95 off-ramp to Davie Boulevard (SR 736)	weaving	44.6	31.5	F	D
NB I-95 off-ramp to Broward Boulevard (SR 842)	off-ramp	37.3	32.1	E	D
NB I-95 on-ramp from Davie Boulevard (SR 736)	on-ramp	36.2	35.8	F	F
Between NB I-95 on-ramp from Davie Boulevard (SR 736) and NB I-95 on-ramp from Broward Boulevard (SR 842)	basic	26.5	26.5	D	D
NB I-95 off-ramp to Sunrise Boulevard (SR 838) WB	off-ramp	44.3	37.3	F	E
Between NB I-95 off-ramp to Sunrise Boulevard (SR 838) WB and NB I-95 on-ramp from Sunrise Boulevard (SR 838)	basic	-	33.0	F	D
NB I-95 on-ramp from Sunrise Boulevard (SR 838)	on-ramp	39.7	33.9	F	F
Between NB I-95 on-ramp from Sunrise Boulevard (SR 838) and NB I-95 off-ramp to Oakland Park Boulevard (SR 816)	basic	43.7	28.5	E	D
NB I-95 off-ramp to Oakland Park Boulevard (SR 816) EB	off-ramp	41.4	42.2	E	E
NB I-95 off-ramp to Oakland Park Boulevard (SR 816) WB	off-ramp	33.9	28.3	F	D
Between NB I-95 off-ramp to Oakland Park Boulevard (SR 816) WB and NB I-95 on-ramp to Oakland Park Boulevard (SR 816)	basic	38.7	28.2	E	D

Source: Design Corridor Traffic Report on file at FDOT District 4

Table 6-6
Northbound PM Peak Hour - Future 2040 Freeway Segments Analysis

Location	Type	Density (pc/min/ln)		LOS	
		No-Build	Build	No-Build	Build
Between southern end and NB I-95 off-ramp to Stirling Road (SR 848)	basic	39.0	43.6	E	E
NB I-95 off-ramp to Stirling Road (SR 848)	off-ramp	36.0	32.3	E	D
NB I-95 on-ramp from Express Lane (left)	on-ramp	37.5	37.7	F	F
Between NB I-95 on-ramp from Express Lane (left) and NB I-95 on-ramp from Stirling Road (SR 848)	basic	29.0	45.0	D	E
Between NB I-95 on-ramp from Stirling Road (SR 848) and NB I-95 off-ramp to Griffin Road (SR 818)	weaving	40.7	36.7	E	E
Between NB I-95 off-ramp to Griffin Road (SR 818) and NB I-95 on- ramp from Griffin Road (SR 818)	basic	32.4	45.0	D	E
Between NB I-95 on-ramp from Griffin Road (SR 818) and NB I-95 off-ramp to I-595	weaving	50.9	50.4	F	F
Between NB I-95 off-ramp to I-595 and NB I-95 off-ramp to SR-84	basic	26.1	26.1	D	D
NB I-95 off-ramp to SR-84	off-ramp	43.7	42.8	F	F
Between NB I-95 off-ramp to SR-84 and NB I-95 on- ramp from SR-84	basic	23.9	39.7	C	E
Between NB I-95 on-ramp from SR-84 and NB I-95 off-ramp to Davie Boulevard (SR 736)	weaving	59.5	40.7	F	E
NB I-95 off-ramp to Broward Boulevard (SR 842)	off-ramp	151.5	33.0	E	D
NB I-95 on-ramp from Davie Boulevard (SR 736)	on-ramp	36.9	36.9	F	F
Between NB I-95 on-ramp from Davie Boulevard (SR 736) and NB I-95 on-ramp from Broward Boulevard (SR 842)	basic	26.5	26.5	D	D
NB I-95 off-ramp to Sunrise Boulevard (SR 838) WB	off-ramp	44.7	38.2	F	E
Between NB I-95 off-ramp to Sunrise Boulevard (SR 838) WB and NB I-95 on-ramp from Sunrise Boulevard (SR 838)	basic	-	32.3	F	D
NB I-95 on-ramp from Sunrise Boulevard (SR 838)	on-ramp	37.0	34.0	F	F
Between NB I-95 on-ramp from Sunrise Boulevard (SR 838) and NB I-95 off-ramp to Oakland Park Boulevard (SR 816)	basic	38.6	28.3	E	D
NB I-95 off-ramp to Oakland Park Boulevard (SR 816) EB	off-ramp	39.9	42.3	E	E
NB I-95 off-ramp to Oakland Park Boulevard (SR 816) WB	off-ramp	31.4	28.3	D	D
Between NB I-95 off-ramp to Oakland Park Boulevard (SR 816) WB and NB I-95 on-ramp to Oakland Park Boulevard (SR 816)	basic	33.2	27.1	D	D

Source: Future Conditions Traffic Operational Analysis on file at FDOT District 4.

Table 6-7 Southbound AM Peak Hour - Future 2040 Freeway Segments Analysis					
Location	**Type**	**Density (pc/min/ln)**		**LOS**	
		No-Build	**Build**	**No-Build**	**Build**
Between northern end and SB I-95 on-ramp from Oakland Park Boulevard (SR 816) WB	basic	25.1	22.3	C	C
SB I-95 on-ramp from Oakland Park Boulevard (SR 816) WB	on-ramp	27.8	27.3	C	C
SB I-95 on-ramp from Oakland Park Boulevard (SR 816) EB	on-ramp	24.0	27.9	C	C
Between SB I-95 on-ramp from Oakland Park Boulevard (SR 816) EB and SB I-95 off-ramp to Sunrise Boulevard (SR 838)	basic	28.0	25.0	D	C
SB I-95 off-ramp to Sunrise Boulevard (SR 838)	off-ramp	47.7	34.9	E	D
Between SB I-95 off-ramp to Sunrise Boulevard (SR 838) and SB I-95 on-ramp from Sunrise Boulevard (SR 838)	basic	24.1	34.8	C	D
Between SB I-95 on-ramp from Sunrise Boulevard (SR 838) and SB I-95 off-ramp to Broward Boulevard (SR 842)	weaving	34.0	39.4	D	E
SB I-95 off-ramp to Davie Boulevard (SR 736)	off-ramp	18.8	25.6	F	F
SB I-95 on-ramp from Broward Boulevard (SR 842)	on-ramp	23.8	31.6	C	D
SB I-95 on-ramp from Davie Boulevard (SR 736)	on-ramp	29.2	35.8	D	E
SB I-95 off-ramp to SR 84	off-ramp	26.3	28.6	C	D
Between SB I-95 off-ramp to SR-84 and SB I-95 on- ramp from SR-84	basic	17.6	32.0	B	D
SB I-95 on-ramp from SR-84	on-ramp	22.4	29.7	C	D
SB I-95 off-ramp to Griffin Road (SR 818)	off-ramp	26.0	32.8	C	D
Between SB I-95 off-ramp to Griffin Road (SR 818) and SB I-95 on- ramp from I-595	basic	18.5	30.4	C	D
SB I-95 on-ramp from I-595	on-ramp	30.6	37.7	D	F
Between SB I-95 on-ramp from I-595 and SB I-95 on- ramp from Griffin Road (SR 818)	basic	25.2	26.5	C	D
Between SB I-95 on-ramp from Griffin Road (SR 818) and SB I-95 off-ramp to Stirling Road (SR 848)	weaving	30.2	35.3	D	E
Between SB I-95 off-ramp to Stirling Road (SR 848) and SB I-95 off- ramp to Express Lane	basic	25.8	33.2	C	D
SB I-95 off-ramp to Express Lane	off-ramp	35.0	32.3	E	D

Source: Future Conditions Traffic Operational Analysis on file at FDOT District 4.

Table 6-8
Southbound PM Peak Hour - Future 2040 Freeway Segments Analysis

Location	Type	Density (pc/min/ln)		LOS	
		No-Build	Build	No-Build	Build
Between northern end and SB I-95 on-ramp from Oakland Park Boulevard (SR 816) WB	basic	28.6	23.5	D	C
SB I-95 on-ramp from Oakland Park Boulevard (SR 816) WB	on-ramp	33.4	31.3	F	D
SB I-95 on-ramp from Oakland Park Boulevard (SR 816) EB	on-ramp	28.0	29.7	C	D
Between SB I-95 on-ramp from Oakland Park Boulevard (SR 816) EB and SB I-95 off-ramp to Sunrise Boulevard (SR 838)	basic	28.6	27.5	D	D
SB I-95 off-ramp to Sunrise Boulevard (SR 838)	off-ramp	41.5	38.0	F	E
Between SB I-95 off-ramp to Sunrise Boulevard (SR 838) and SB I-95 on-ramp from Sunrise Boulevard (SR 838)	basic	45.0	40.7	E	E
Between SB I-95 on-ramp from Sunrise Boulevard (SR 838) and SB I-95 off-ramp to Broward Boulevard (SR 842)	weaving	34.1	40.4	D	E
SB I-95 off-ramp to Davie Boulevard (SR 736)	off-ramp	25.6	30.3	F	F
SB I-95 on-ramp from Broward Boulevard (SR 842)	on-ramp	27.6	34.8	C	D
SB I-95 on-ramp from Davie Boulevard (SR 736)	on-ramp	32.4	37.2	D	E
SB I-95 off-ramp to SR 84	off-ramp	27.6	30.7	C	D
Between SB I-95 off-ramp to SR 84 and SB I-95 on-ramp from SR 84	basic	19.8	30.4	C	D
SB I-95 on-ramp from SR 84	on-ramp	26.3	33.6	C	D
SB I-95 off-ramp to Griffin Road (SR 818)	off-ramp	20.2	36.5	C	E
Between SB I-95 off-ramp to Griffin Road (SR 818) and SB I-95 on- ramp from I-595	basic	25.6	30.4	C	D
SB I-95 on-ramp from I-595	on-ramp	34.3	42.1	F	F
Between SB I-95 on-ramp from I-595 and SB I-95 on- ramp from Griffin Road (SR 818)	basic	26.5	26.5	D	D
Between SB I-95 on-ramp from Griffin Road (SR 818) and SB I-95 off-ramp to Stirling Road (SR 848)	weaving	36.0	41.7	E	E
Between SB I-95 off-ramp to Stirling Road (SR 848) and SB I-95 off- ramp to Express Lane	basic	35.3	34.8	E	D
SB I-95 off-ramp to Express Lane	off-ramp	29.3	35.6	D	E

Source: Future Conditions Traffic Operational Analysis on file at FDOT District 4.

6.2.2.2 Freeway Segment Analysis of Express Lanes

The performance of the express lanes was analyzed for the year 2020, 2030, and 2040. The measures of effectiveness utilized for this analysis include density and LOS. In both the AM and PM peak hours the traffic volumes on the express lanes resulted in acceptable levels of service as show in **Table 6-9** and **Table 6-10**. In fact, the majority of the segments in the year 2040 operate at LOS C.

Table 6-9
Future Express Lanes AM Peak Hour Freeway Segment Analysis

Location	Type	2020		2030		2040	
		Density	LOS	Density	LOS	Density	LOS
Northbound							
Between southern end AND NB off-ramp to I-95 (south of Stirling Rd)	basic	22.7	C	26.0	D	30.6	D
NB off-ramp to I-95 (south of Stirling Rd)	off-ramp	25.1	C	27.8	C	30.8	D
Between NB off-ramp to I-95 AND NB off-ramp to Park and Ride Lot	basic	17.2	B	19.1	C	21.9	C
NB off-ramp to Park and Ride Lot	off-ramp	20.2	C	22.2	C	24.9	C
Between NB off-ramp to Park and Ride Lot AND NB on- ramp from Park and Ride Lot	basic	11.7	B	13.4	B	15.5	B
NB on-ramp from Park and Ride Lot	on-ramp	26.3	C	28.2	D	32.0	D
Between NB on-ramp from Park and Ride Lot AND northern end	basic	19.7	C	21.5	C	25.6	C
Southbound							
Between northern end AND SB off-ramp to Park and Ride Lot	Basic	9.0	A	10.8	A	16.7	B
SB off-ramp to Park and Ride Lot	off-ramp	12.7	B	14.6	B	20.7	C
Between SB off-ramp to Park and Ride Lot AND SB on- ramp from Park and Ride Lot	basic	4.1	A	5.5	A	10.6	A
SB on-ramp from Park and Ride Lot	on-ramp	12.4	B	15.3	B	22.2	C
Between SB on-ramp from Park and Ride Lot AND SB on-ramp from I-95 (south of Stirling Rd)	basic	7.5	A	10.0	A	16.0	B
SB on-ramp from I-95 (south of Stirling Rd)	on-ramp	19.6	B	23.8	C	30.6	D

Table 6-10
Future Express Lanes PM Peak Hour Freeway Segment Analysis

Location	Type	2020		2030		2040	
		Density	LOS	Density	LOS	Density	LOS
Northbound							
Between southern end AND NB off-ramp to I-95 (south of Stirling Rd)	basic	18.4	C	22.5	C	28.4	D
NB off-ramp to I-95 (south of Stirling Rd)	off-ramp	21.0	C	24.9	C	29.5	D
Between NB off-ramp to I-95 AND NB off-ramp to Park and Ride Lot	basic	12.1	B	13.2	B	19.9	C
NB off-ramp to Park and Ride Lot	off-ramp	14.8	B	15.9	B	23.0	C
Between NB off-ramp to Park and Ride Lot AND NB on- ramp from Park and Ride Lot	basic	8.5	A	8.2	A	13.9	B
NB on-ramp from Park and Ride Lot	on-ramp	18.5	B	18.7	B	27.2	C
Between NB on-ramp from Park and Ride Lot AND northern end	basic	12.7	B	12.9	B	20.4	C
Southbound							
Between northern end AND SB off-ramp to Park and Ride Lot	basic	16.1	B	20.8	C	25.1	C

Table 6-10
Future Express Lanes PM Peak Hour Freeway Segment Analysis

Location	Type	2020		2030		2040	
		Density	LOS	Density	LOS	Density	LOS
SB off-ramp to Park and Ride Lot	off-ramp	20.1	C	24.9	C	28.6	D
Between SB off-ramp to Park and Ride Lot AND SB on- ramp from Park and Ride Lot	basic	8.1	A	12.5	B	15.1	B
SB on-ramp from Park and Ride Lot	on-ramp	20.1	C	25.7	C	28.8	D
Between SB on-ramp from Park and Ride Lot AND SB on-ramp from I-95 (south of Stirling Rd)	basic	14.2	B	19.0	C	21.9	C
SB on-ramp from I-95 (south of Stirling Rd)	on-ramp	26.9	C	33.0	D	35.8	E

6.2.2.3 Express Lane Call Analysis from Stirling Rd to Broward Blvd

The study team evaluated the Value Engineering (VE) recommendation to provide only one Express Lane between Stirling Road (SR 848) to Broward Boulevard (SR 842). Based on the forecasted volume tabulated below in **Table 6-11**, the need for two Express Lanes throughout the corridor is warranted. The cells in red highlight the sections that would be operating "over capacity". As shown in the table the single Express Lane has estimated volumes higher than capacity as early as 2020. By 2040 almost all of the segments would be failing.

Table 6-11
One-Express Lane Analysis – Traffic Volumes

Year	AM		PM	
	NB	SB	NB	SB
2020	2,449	1,068	1,720	2,021
2030	2,721	1,429	1,877	2,705
2040	3,079	2,277	2,822	3,082

Note: Traffic volumes in red signify over capacity

It is important to note that a single Express Lane for this section would also have severe impacts that extend beyond capacity, such as operation (transit vehicles would tend to slow vehicles down), safety and incident management (with a single lane, the entire Express Lane section would need to be shut down), and maintenance. In addition, providing one Express Lane is not consistent with the purpose and need of the project.

6.2.2.4 Intersection Operational Analysis

The future (2040) intersection operational analysis was performed for the signalized intersections using SYNCHRO Version 8.0. **Table 6-12** and **Table 6-13** present the intersection analysis results for both the AM and PM peak hours, respectively. The details of the intersection operational analysis are included in the **Future Conditions Traffic Operational Analysis** on file at FDOT District 4.

Any recommendations for ramp terminal improvements within the **Future Conditions Traffic Operational Analysis** report will be considered for implementation under the Districtwide PD&E Project Traffic Interchange Analysis for Broward County (42598023201 & 42598022201) to be advertised in spring 2013.

Table 6-12 Future (2040) Intersection Performance – AM Peak Hour					
Ramp/Intersection	**Intersection Delay (sec/veh)**	**Intersection LOS**	**Approach**	**Approach Delay (sec/veh)**	**Approach LOS**
Oakland Park Boulevard (SR 816) SB Ramps	34.3	C	EB	61.6	E
			WB	11.4	B
			SB	20.5	C
Oakland Park Boulevard (SR 816) NB Ramps	10.7	B	EB	3.9	A
			WB	20.4	C
			SB	15.0	B
Sunrise Boulevard (SR 838) SB Ramps	59.7	E	EB	55.4	E
			WB	47.9	D
			SB	91.5	F
Sunrise Boulevard (SR 838) NB Ramps	10.9	B	EB	5.4	A
			WB	18.7	B
Broward Boulevard (SR 842) SB Ramps	108.8	F	EB	126.4	F
			WB	21.6	C
			SB	229.5	F
Broward Boulevard (SR 842) NB Ramps	76.3	E	EB	4.5	A
			WB	42.3	D
			NB	239.5	F
Davie Boulevard (SR 736) SB Ramps	102.8	F	EB	161.7	F
			WB	15.0	B
			SB	72.6	E
Davie Boulevard (SR 736) NB Ramps	58.5	E	EB	29.7	C
			WB	33.1	C
			NB	132.6	F
Griffin Road (SR 818) SB Ramps	82.1	F	EB	54.3	D
			WB	28.1	C
			SB	185.0	F
Griffin Road (SR 818) NB Ramps	69.2	E	EB	36.5	D
			WB	71.6	E
			NB	118.7	F
Stirling Road (SR 848) SB Ramps	71.8	E	EB	104.3	F
			WB	12.9	B
			SB	120.3	F
Stirling Road (SR 848) NB Ramps	97.4	F	EB	9.3	A
			WB	160.3	F
			NB	117.4	F

Source: Future Conditions Traffic Operational Analysis on file at FDOT District 4.

Table 6-13 Future (2040) Intersection Performance – PM Peak Hour					
Ramp/Intersection	**Intersection Delay (sec/veh)**	**Intersection LOS**	**Approach**	**Approach Delay (sec/veh)**	**Approach LOS**
Oakland Park Boulevard (SR 816) SB Ramps	63.1	E	EB	88.9	F
			WB	59.5	E
			SB	17.5	B
Oakland Park Boulevard (SR 816) NB Ramps	41.3	D	EB	3.3	A
			WB	94.2	F
			SB	16.0	B
Sunrise Boulevard (SR 838) SB Ramps	48.4	D	EB	30.2	C
			WB	24.8	C
			SB	145.5	F
Sunrise Boulevard (SR 838) NB Ramps	19.4	B	EB	6.3	A
			WB	31.2	C
Broward Boulevard (SR 842) SB Ramps	131.9	F	EB	207.6	F
			WB	25.0	C
			SB	253.8	F
Broward Boulevard (SR 842) NB Ramps	109.4	F	EB	1.7	A
			WB	100.7	F
			NB	247.9	F
Davie Boulevard (SR 736) SB Ramps	37.7	D	EB	46.2	D
			WB	17.6	B
			SB	91.2	F
Davie Boulevard (SR 736) NB Ramps	65.5	E	EB	13.1	B
			WB	69.1	E
			NB	81.9	F
Griffin Road (SR 818) SB Ramps	75.5	E	EB	59.3	E
			WB	28.2	C
			SB	161.8	F
Griffin Road (SR 818) NB Ramps	107.7	F	EB	16.0	B
			WB	144.6	F
			NB	181.1	F
Stirling Road (SR 848) SB Ramps	84.0	F	EB	95.2	F
			WB	27.1	C
			SB	164.5	F
Stirling Road (SR 848) NB Ramps	122.3	F	EB	9.7	A
			WB	201.5	F
			NB	178.3	F

Source: Future Conditions Traffic Operational Analysis on file at FDOT District 4.

6.3 Right of Way Needs and Relocation

No right of way acquisition is anticipated to accommodate the roadway improvements required to implement the Recommended Alternative. The stormwater treatment needs will be accommodated within the existing right of way. This project will not require any relocation.

6.4 Preliminary Cost Estimates

The preliminary cost estimate for the Recommended Alternative is presented in **Table 6-4.**

Table 6-14
Preliminary Cost Estimate

Proposed Alternative	Long Range Estimate	20% Contingency	Total
	$70,413,471	$14,082,694	**$84,496,165**

6.5 Schedule and Funding

The PD&E approval including the Location Design Concept Acceptance (LDCA) is anticipated in summer 2013. **Figure 6-4** summarizes the base schedule of the future phases of the I-95 Express Project. This tentative schedule is based on discussions held during the Cost Risk Analysis (CRA) workshop conducted as part of this PD&E from September 24 through September 27, 2012.

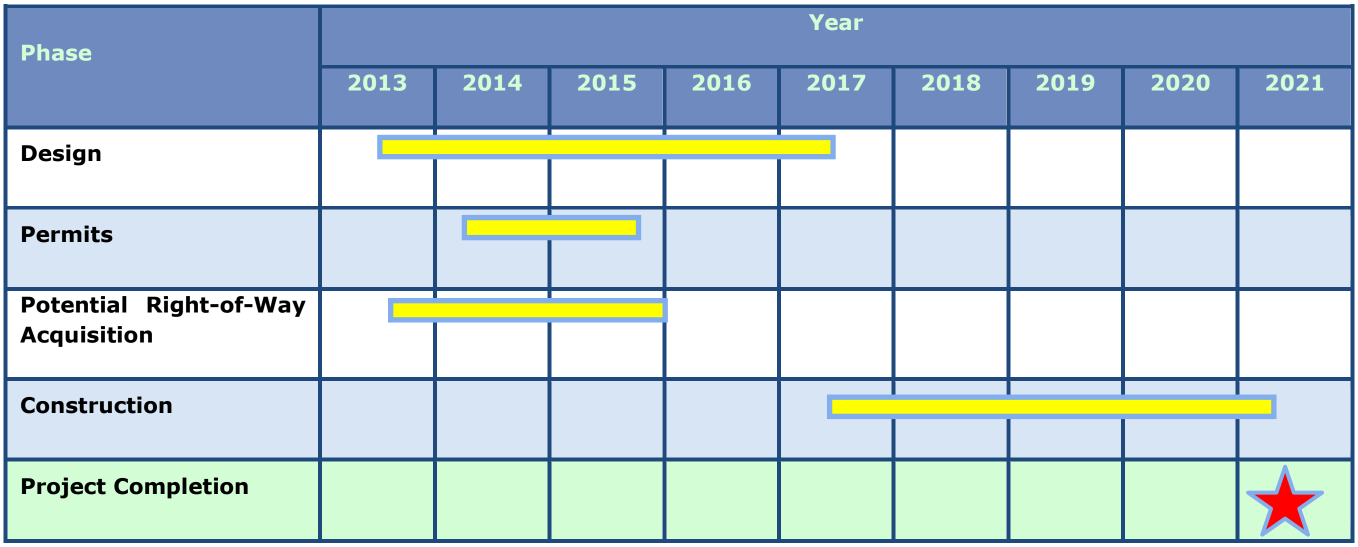


Figure 6-4
Project Schedule

The design and construction of the proposed improvements from Stirling Road to Oakland Park Boulevard are currently federally funded. Design is funded in the 1st five years of the Work Program (FY 2015) and construction is funded in the 2nd five years of the SIS Plan (FY 2019 and 2021)*. Construction funding and delivery methods will be evaluated by the Department to determine the final construction funding plan for this segment and the entire next phase of I-95 Express from Stirling Road (SR 848) to Linton Boulevard (CR 782).

Work Program Public Hearings will be held in November of this year. During these annual hearings, the public will be informed of the federal funding associated with this project.

* Note: The 2nd five year SIS plan comprises SIS projects that are scheduled to be funded in the five years (FY 2019 through 2023) following the 1st five year Work Program (FY 2014 through 2018).

6.6 Pedestrian and Bicycle Facilities

No pedestrian and bicycle facilities are planned as part of the proposed improvements along I-95. Pedestrian and bicycle facilities are present along several of the overpasses and underpasses of the cross streets and these facilities will not be impacted as part of the Recommended Alternative.

6.7 Utility

Under the Recommended Alternative, several utility facilities will be in conflict with the proposed improvements, particularly at the crossing roadways and interchanges where the facilities are either underground or attached underneath the bridges. **Table 6-15** shows the utilities at all interchanges and at key overpasses where these potential utility impacts may result from the proposed construction. In addition to the utilities at the interchanges and overpasses, ITS Fiber Optic cables run along the east side of I-95 from the beginning of the project to just north of SR 84 where they cross to the west side and run along the right of way line until the end of the project. No impacts to these ITS Fiber Optic cables are expected because they run close to the right of way line; however, their exact location is not known at this time and should be horizontally and vertically verified during design and construction. It should be noted that most of the UAO(s) owning major facilities within the area of the project have master agreements with FDOT. Should the need to relocate arise, this should expedite the coordination process eliminating the need for individual work agreements. Refer to **Appendix G**, Concept Plans for approximate locations of the utilities.

Table 6-15
Utilities

Location along I-95	Utilities						
	Electric	WM	FM	Gas	BFO	BT	Jet Fuel
Stirling Road (SR 848) Interchange	23KV & 138 KV	12 in.	4 & 10 in.	6 in.	2 conduits	4 in. conduit	-
North of Stirling Road (SR 848) interchange	23KV & 138 KV	-	-	-	-	1 conduit	-
Griffin Road (SR 818)	23KV	12 & 16 in.	10 in.	6 in.	2 conduits	2 conduits	10 in.
SW 42nd Street	23KV	10 & 12 in.	10 & 12 in.	-	1 conduit	-	-
I-595		12 in.	-	16 in.	2 conduits	-	-
SR 84	23KV	-	-	-	1 conduit	-	-
Davie Boulevard (SR 736)	BE	24 in.	-	1 gas line	2 conduits	-	-
Broward Boulevard (SR 842)	-	36 in.	-	-	1 conduit	1 conduit	-
NW 6th Street	23KV, 138 KV	10 in.	14 & 18 in.	-	1 conduit	-	-
Sunrise Boulevard (SR 838)	23KV	-	-	-	1 conduit	1 conduit	-
NW 19th Street	23KV	10 & 24 in.	12 in.	-	1 conduit		-
Oakland Park Boulevard (SR 816)	23KV, 138 KV	18 in.	12 in.	-	2 conduits	1 conduit	-

6.8 Temporary Traffic Control Plan

The traffic control scheme is outlined below to streamline the construction process, minimize disruptions to the commuters and safely maintain traffic along the corridor. The corridor has been divided into four potential construction segments consistent with the highway typical section configurations. The segments are:

1. Stirling Road (SR 848) to SR 84
2. SR 84 to south of the Park & Ride
3. Segment between Park & Ride ramps
4. North of the Park & Ride to Oakland Park Boulevard (SR 816)

The construction activities can typically be completed in three phases. Phase 1 features widening to the outside. Phase 2 features widening to the inside. Phase 3 features milling and resurfacing and overbuild operations, after all widening has been completed. The widening of the bridges will be done in accordance with the phasing and sequencing of the roadway. The phases, when applicable, are divided into Sequence 1 for the northbound lanes and Sequence 2 for the southbound lanes.

Within the first and fourth segments the existing pavement is widened toward the outside. The existing roadway within these segments is sufficiently wide to accommodate a temporary concrete barrier wall with the required 2 ft. buffer to either side. In each direction, one general purpose lane and the HOV lane will be maintained 12 ft. wide. All other general purpose lanes and the auxiliary lanes are reduced to 11 ft. As shown in **Figure 6-5**, the widening operation for these segments will be accomplished in Phase 1 that is divided into Sequences 1 and 2.

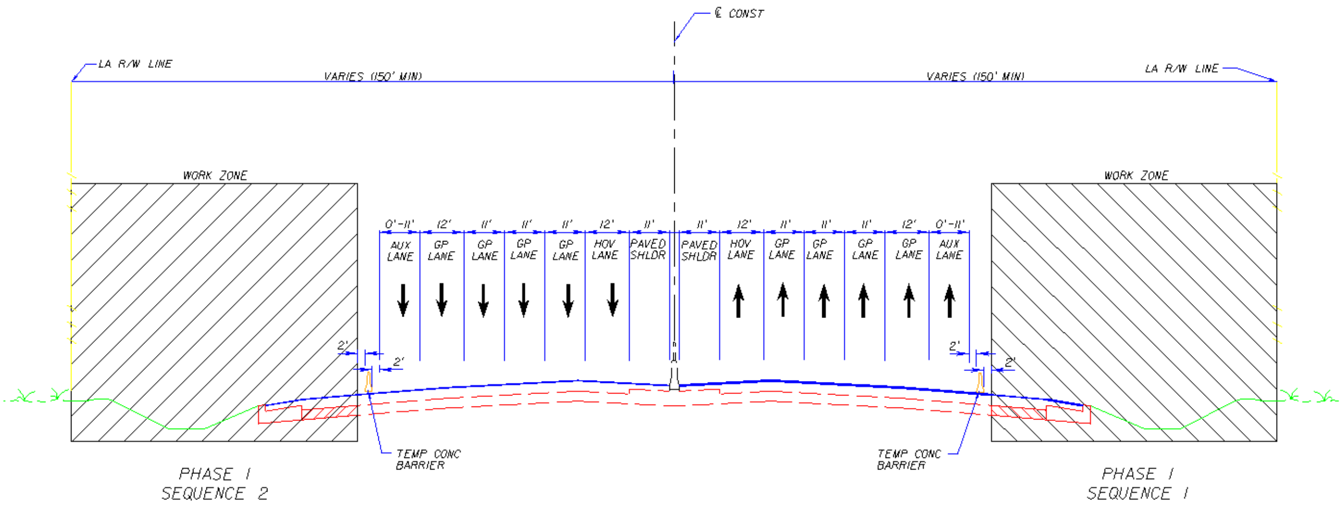


Figure 6-5 Traffic Control Plan Segments 1 and 4 from Stirling Road (SR 848) to SR 84 and from North of the Park & Ride to Oakland Park Boulevard (SR 816)

The second segment features a concrete median, approximately 14 ft. wide, which will be removed to accommodate traffic lanes and shoulders. For this segment widening will be performed towards both the inside and outside. Phase 1 will feature the outside widening, which will be done in two sequences. The existing roadway within this segment is sufficiently wide to accommodate a temporary concrete barrier wall with adequate buffers, as per Index 415, to either side. In each direction, one general purpose lane and the HOV lane will be maintained 12 ft. wide. All other general purpose lanes and the auxiliary lanes are reduced to 11 ft. (see **Figure 6-6**). The lane closure analysis will determine if temporary pavement needs to be constructed during Phase 1 for use during Phase 2. For this traffic control plan, the temporary pavement is being shown.

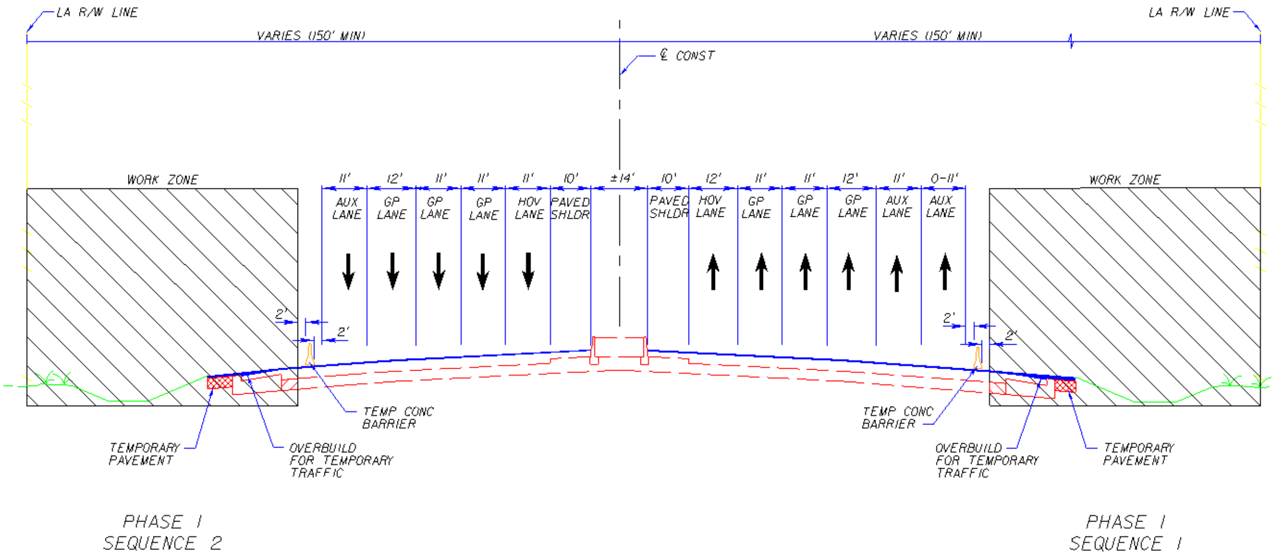


Figure 6-6 Traffic Control Plan Segment 2 - Phase 1
Traffic Control Plan from SR 84 to South of the Park & Ride – Phase 1

Phase 2 will include widening to the inside. Currently within this segment, all lanes are sloping toward the outside. During Phase 2, approximately 7 ft. of the existing roadway will be reconstructed in order to slope the Express Lanes towards the median. See **Figure 6-7**.

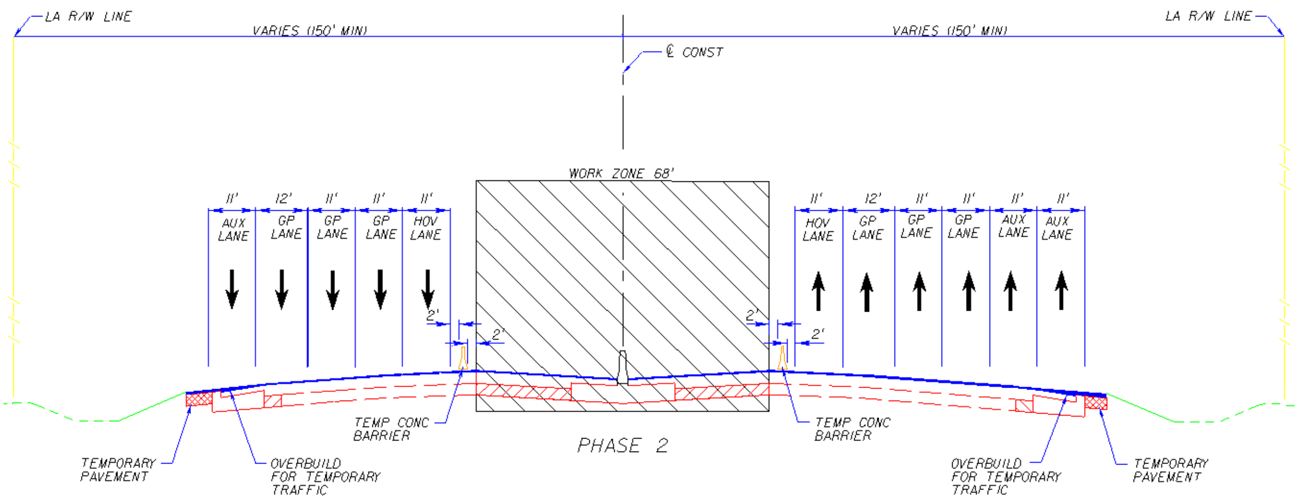


Figure 6-7 Traffic Control Plan Segment 2 - Phase 2
from SR 84 to South of the Park & Ride – Phase 2

In the third segment, the northbound lanes are flanked by a CD road along the outside. As a result, widening for the northbound lanes will be towards the existing grass median. The southbound lanes will be widened towards the outside. In both directions, the existing roadway is sufficiently wide to accommodate one 12 ft. wide lane and a temporary concrete barrier wall with adequate buffers, as per Index 415, to either side. See **Figure 6-8**.

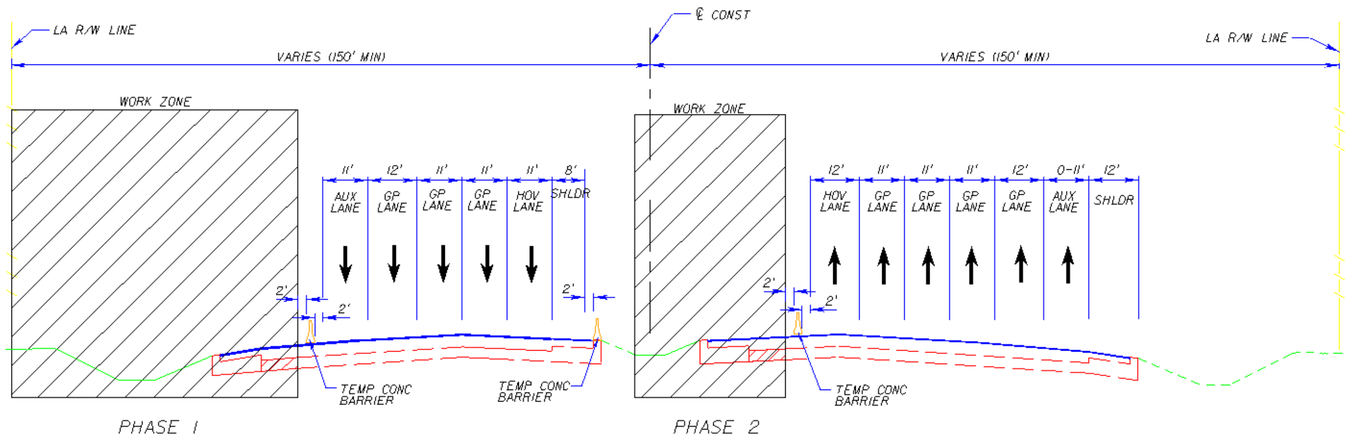


Figure 6-8 Traffic Control Plan Segment 3
from South of the Park & Ride to North of the Park and Ride

The traffic control for the fourth segment will be identical to the traffic control for the first segment and is depicted in **Figure 6-9**.

The widening of the bridges will be done in accordance with the phasing and sequencing of the roadway.

The NW 19 Street bridges will be reconstructed. This construction will require 4 phases, which would also include the reconstruction of 1/3 of a mile of roadway on either approach to the bridge. For this segment of roadway construction, the maintenance of traffic phasing should coincide with that of the bridges.

During the first phase, temporary widening will be constructed toward the outside, in both directions. Traffic will be shifted to utilize the widened bridge. See **Figure 6-9**.

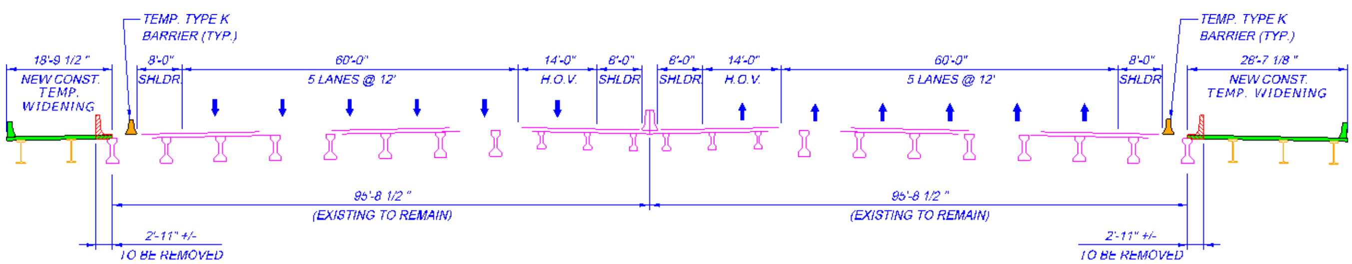


Figure 6-9
Traffic Control Plan at NW 19 Street Bridge – Phase 1

During the second phase, the inside portion of the existing bridges is replaced with a new bridge. See **Figure 6-10**.

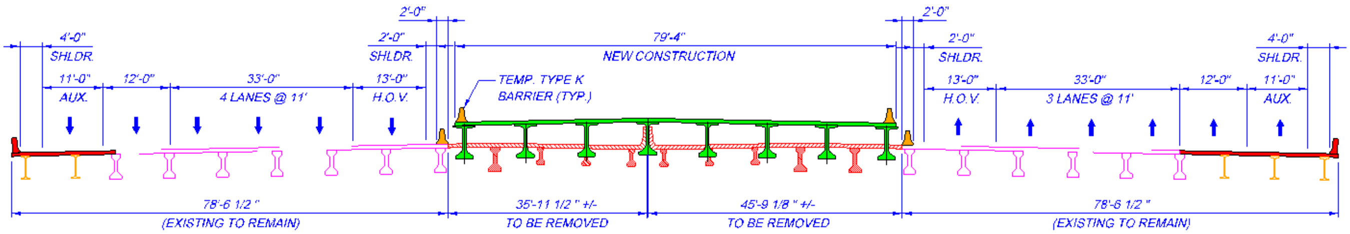


Figure 6-10
Traffic Control Plan at NW 19 Street Bridge – Phase 2

During Phase 3, the southbound traffic is shifted onto the new bridge and the remaining southbound portion of the proposed bridge is constructed. See **Figure 6-11**.

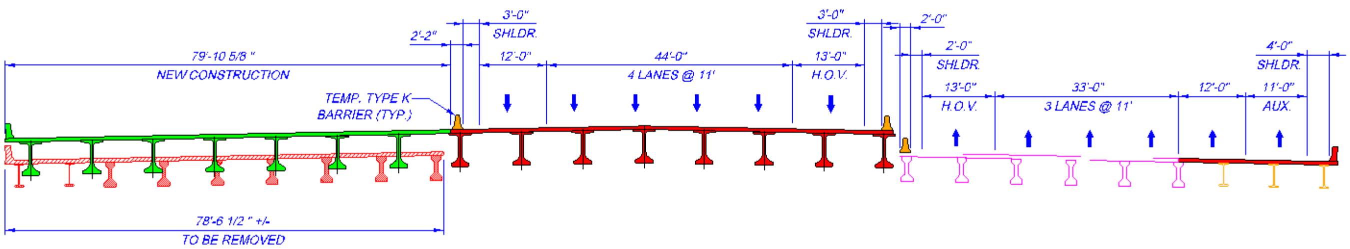


Figure 6-11
Traffic Control Plan at NW 19 Street Bridge – Phase 3

During Phase 4, the northbound traffic is shifted onto the middle portion of the bridge and the remaining northbound portion is constructed. See **Figure 6-12**.

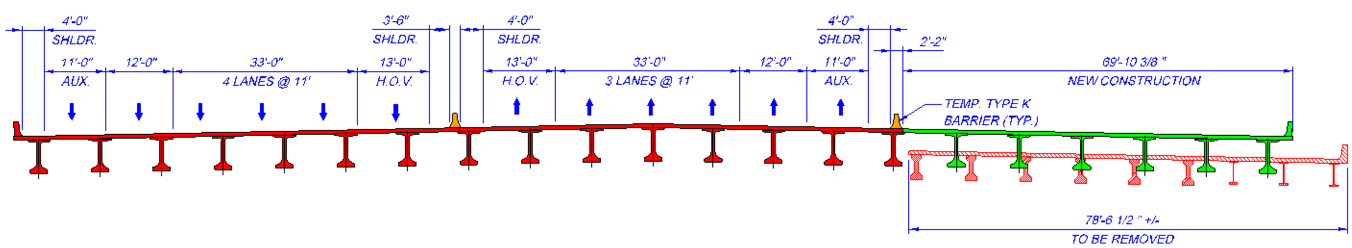


Figure 6-12
Traffic Control Plan at NW 19 Street Bridge – Phase 4

A more detailed description of the temporary traffic control plan for the bridges is included in the **Bridge Analysis Report** prepared for this PD&E and on file at FDOT District 4.

6.9 Drainage

Stormwater treatment of the project runoff will be provided as required by the SFWMD Environmental Resource Permit (ERP). The Stormwater management systems proposed by this study meet existing water quality standards set forth in Chapter 62-302 of the Florida Administrative Code. Water quality will be provided for the increase in impervious area. The post-development discharge volume will be attenuated so that it is not greater than the predevelopment discharge. The project area outfalls to water bodies identified by the Florida Department of Environmental Protection (FDEP) as impaired waters. Nutrient loading calculations were performed based on the modified Harper methodology where the predevelopment condition is the existing condition. Calculations for the stormwater management system are contained in the **Stormwater Management Report** on file at FDOT District 4. The proposed stormwater management system will not require acquisition of right of way. A summary of the preliminary drainage calculations for Build Alternative 1 is provided below in **Table 6-16**.

Table 6—16
Summary of Preliminary Stormwater Management Calculations

System	Regional Basin		Stationing		Net Storage (Ac-ft)		Comment
	SFWMD	FDEP WBID	Begin	End	*Required	Replacement	
A	C-10	3282	954+00	1009+00	0.45	0.57	Surplus treatment
B	Coral Reef	3277E	1009+00	1056+00	0.53	2.41	Surplus treatment
C	Coral Reef	3277A	1056+00	1108+00	0.62	1.39	Surplus treatment
D	Coral Reef	3277A	1108+00	1163+00	0.26	1.12	Surplus treatment
E	Coral Reef	3277A	1163+00	1198+00	0.02	0.47	Surplus treatment
F	C-12	3276A	1198+00	1264+00	0.32	0.00	*Deficit Treatment Compensated in System E*
G	C-12	3276A	1264+00	1342+00	0.57	0.60	Surplus treatment
H	C-13 East	3274	1342+00	1405+00	0.76	1.24	Surplus treatment
I	C-13 East	3274	1405+00	1441+00	0.46	0.51	Surplus treatment
TOTAL:					**3.99**	**8.31**	**4.32 Ac-ft Surplus treatment**

***NOTE:** The *Required Net Storage* is the sum of existing storage lost due to roadway widening plus the storage needed to meet water quality and attenuation requirements.

6.10 Environmental Impacts

6.10.1 Wetland Evaluation

A **Wetland Evaluation Report (WER)** was prepared for the project, and resulted in the finding that the stormwater swales located within and adjacent to the R/W are components of the highway drainage system, i.e., are constructed (man-made) features. Some swales have greater than 50% aerial coverage of obligate and facultative wet vegetation, and others have less than 50% coverage; the latter were classified as Other Surface Waters (OSWs), which also included retention ponds and the four tidal canals that cross underneath I-95. The total acreages of each that were identified within the project limits were determined to be 21.60 and 55.93 acres, respectively.

As detailed in the WER, for the Recommended Alternative, the estimated total amount of impacts to stormwater swales supporting hydrophytic vegetation is 2.17 acres and to OSWs is 2.32 acres (the latter includes 0.11 acres of impacts to fringe mangroves adjacent to the canal bridges). These amounts were broken down as: direct impacts of 1.60 acres to stormwater swales with hydrophytic vegetation and 1.51 acres to OSWs; indirect effects of 0.57 acres and 0.81 acres, respectively. No cumulative effects are anticipated. Final acreages will be determined during the environmental permitting process.

Avoidance and minimization efforts include: elimination of work over the South Fork of the New River; constraining the typical section throughout the I-95/I-595 Interchange where the majority of wetland swales are located; and other minor construction modifications to swales/retention ponds. Where possible, impacted wet swales will be replaced with similar swales. As detailed in the WER, compensatory mitigation options include: purchase of mitigation bank credits (e.g., Loxahatchee or Everglades Mitigation Bank), FDOT's off-site mitigation area located within West Lake Park, and/or restoration within FDOT R/W (surplus lands). Final mitigation requirements will be determined during final design through the environmental permitting process.

The FDOT will incorporate avoidance and minimization criteria during design and through the permitting process to reduce these impacts as much as practical. If applicable, wetland reviews of off-site pond or other drainage locations during final design will be performed. The project will not result in a significant adverse impact to wetlands or OSWs within or adjacent to the corridor.

6.10.2 Essential Fish Habitat Assessment

An **Essential Fish Habitat (EFH) Assessment** was prepared to document project involvement with areas designated by the National Marine Fisheries Service (NMFS) as EFH along with associated managed species, in compliance with the 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity". A subset of EFH is Habitat Areas of Particular Concern (HAPC), such as mangroves, which merit special considerations based on the ecological value of the habitat to managed fish populations.

EFH habitats identified within the project area were found to be estuarine scrub/shrub mangroves, sand/mud bottom, and palustrine emergent (tidal freshwater) systems. No rooted marine seagrass was identified. Based on the EFH habitats identified, as well as EFH guidelines, the Shrimp Fishery and Snapper Grouper Complex Fishery Management Units were determined to be located within the project area. These units include various species of penaeid shrimp (e.g., pink shrimp) and juvenile fishes (snappers, goliath grouper, white grunt), all of which could potentially occur within the project limits.

Widening of the I-95 bridges over the Dania Cut-Off Canal, North Fork of the New River, and Middle River/C-13 East Canal is proposed. Although EFH resources occur within the area of construction, the potential impacts to fisheries will be negligible. The Recommended Alternative is estimated to result in direct impacts to 0.31 acres of EFH, which include: 0.11 acres of mangrove, 0.19 acres of sand/mud bottom, and less than 0.01 acres of tidal freshwater/submerged aquatic vegetation (SAV) (e.g., freshwater tape grass) habitats. Mangrove impacts will involve the direct removal of the resource to accommodate the construction of Mechanically Stabilized Earth (MSE) walls. The sand/mud bottom impacts will involve both shading from the proposed bridge and pile caps as well as the placement of piles within the resource, and the SAV impacts will result from shading.

The FDOT will utilize Best Management Practices (BMP) to minimize any temporary impacts that may occur during construction, and comply with current National Pollutant Discharge Elimination System (NPDES) criteria, including preparation of a Stormwater Pollution Prevention Plan (SWPPP) to prevent stormwater runoff from entering wetlands or surface waters. The FDOT will continue to incorporate avoidance and minimization throughout final design. Other EFH avoidance and minimization efforts include no construction work over the South Fork of the New River, and the use of MSE walls rather than 2:1 side slopes that would further encroach into EFH habitat, particularly mangrove habitat. It is expected that fishery resources (e.g., shrimp, fish described above) will avoid construction areas, resulting in only a temporary displacement of individuals. No indirect or cumulative effects are anticipated.

Compensatory mitigation options that could offset the small amount of impact to EFH include: purchase of mitigation bank credits, FDOT's off-site mitigation area located within West Lake Park, and/or restoration within FDOT R/W (surplus lands). Mitigation for impacts to sand/mud bottom is typically not required. Based on input from NMFS, the small amount of impacts to freshwater SAV could be offset by the removal of exotic vegetation in the area of impact, or demonstrating an overall increase in water quality associated with the project's drainage improvements. The type and amount of mitigation required for this project will be determined during final design through the environmental permitting process.

The EFH Assessment Report was submitted to the NMFS for concurrence that the project would not have a substantial adverse impact on EFH and managed species. On June 20, 2013, the NMFS provided concurrence with the findings of the EFH Assessment including conceptual mitigation, noting that the project would have an adverse impact on EFH. In response to the NMFS' Conservation Recommendation, the FDOT will provide to NMFS for review and approval (during final design through the environmental permitting process) a detailed mitigation plan that fully offsets the unavoidable adverse impacts to mangroves and tidal freshwater SAV, i.e., EFH.

6.10.3 Wildlife and Habitat

An **Endangered Species Biological Assessment (ESBA)** was prepared to document project involvement with protected (listed) species in compliance with Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended. Identified in the ESBA are the Federally and/or State listed species that could potentially occur in the project area, consisting of 13 species designated as Federally Endangered or Threatened, and 12 species designated as State Threatened or Species of Special Concern. An evaluation of potential effects that the proposed improvements may have on these species was conducted.

The US Fish and Wildlife Service (USFWS) stated that although the project area is located within the Core Foraging Areas (CFA) of the endangered wood stork, due to the urban setting, it is unlikely the project will adversely affect the wood stork or other known federally-listed species. The four tidal canals along the project corridor are designated as Manatee Protection Zones.

No evidence of the occurrence of any protected species was found, as limited or no suitable habitats for any of these species occur in the highly urbanized and disturbed project area. The stormwater swales within the R/W provide marginal habitat for wading birds, including the wood stork, and impacts to these areas will be minimized. Potential temporary involvement with manatee habitat resulting from the Recommended Alternative may result from bridge widening and/or installation of piers within the North Fork of the New River and Dania Cut-Off Canal.

As stated in the Wetland Evaluation section, the Recommended Alternative will impact an estimated 2.17 acres of stormwater swales with hydrophytic vegetation, and 2.32 acres of other stormwater swales and surface waters. The stormwater swales with hydrophytic vegetation in the project area may provide suitable foraging habitat (SFH) for wood storks, although their location within or adjacent to I-95 and/or the CSX railroad decreases their suitability. The retention ponds and tidal canals, including mangroves, were not considered SFH.

The USFWS Wood Stork Biomass Analysis that was performed to assess the potential biomass associated with the project, resulted in 13.14 kg of available biomass, including 5.02 kg within the R/W. The Recommended Alternative impacts approximately 1.68 kg of biomass. Further coordination with USFWS during final design is needed to determine if wood stork nesting colonies are active in the project area and if SFH impacts apply.

If biomass mitigation for loss of wood stork foraging habitat is required, it will occur through purchase of mitigation credits from an appropriate USFWS-approved mitigation bank (e.g., Everglades or Loxahatchee Mitigation Bank). Based on the results of the biomass analysis, and existing mitigation bank credits, less than two credits would be needed to mitigate the estimated 1.65 kg of biomass lost as a result of the project. Where possible, impacted wet swales will be replaced with similar swales. The final mitigation acreage, if applicable, will be determined during the environmental permitting process. Thus, no net loss of wood stork SFH is anticipated as a result of the project.

Based upon the results of the ESBA, the following determinations of effects on Federally-listed species were made: *"may affect, not likely to adversely affect"* for the West Indian manatee, Wood Stork, Eastern Indigo snake, and gopher tortoise; *"no effect"* for the Everglade snail kite, American Alligator, four species of sea turtles, smalltooth sawfish, and three species of plants. In addition (although not required), similar determinations of effect for State-listed avian species were made: "*may affect, not likely to adversely affect*" for all species, except *"no effect"* for the least tern and brown pelican.

The ESBA was submitted to the USFWS for concurrence that the project will not adversely affect Federally-listed species under their purview. On May 14, 2013, the USFWS provided concurrence with the determinations of *may affect, not likely to adversely affect* for the West Indian manatee, Eastern indigo snake, and wood stork. (The ESBA was not submitted to the NMFS, since the project was determined to have *no effect* on the four species of sea turtles and smalltooth sawfish.)

The FDOT will ensure that protection measures including the Florida Fish and Wildlife Commission (FWC) *Standard Manatee Conditions for In-Water Work,* USFWS *Standard Protection Measures for the Eastern Indigo Snake,* and NMFS *Sea Turtle and Smalltooth Sawfish Construction Conditions* are implemented during construction. If R/W is acquired for offsite ponds or other drainage features, the FDOT will perform protected species and wetlands reviews of those locations during final design.

6.10.4 Historic and Archaeological Resources

A **Cultural Resource Assessment Survey (CRAS)** was conducted for the project, in accordance with the procedures contained in 36 CFR Part 800, background research and a field survey coordinated with the State Historic Preservation Officer (SHPO). The purpose of the CRAS was to locate and evaluate historic (constructed in 1964 or earlier) resources and archaeological sites within the project Area of Potential Effect (APE) and to assess their eligibility for inclusion in the National Register of Historic Places (National Register).

6.10.4.1 Historic Resources

As a result of the assessment, five historic resources (four previously recorded and one newly recorded) within the APE were identified. Of these historic resources, two are considered eligible for listing in the National Register: the *Seaboard Air Line/CSX Railroad (8BD4649)*, and the newly recorded *North Woodlawn Cemetery (8BD4879)*. Both the *Dania Canal (8BD3221)* and the *Middle River Canal (8BD3225)* are ineligible for the National Register, and there is insufficient information to make a proper determination of eligibility for *Griffin Road (8BD4432)*.

The Seaboard Air Line/CSX Railroad is located adjacent to the western project R/W along much of the project's length. Only approximately 1.45 miles of the tracks are included within the APE, as the railroad enters and exits the APE at several locations within the project limits. The section of railroad between Davie Boulevard and SR 84 was previously determined (2010) to be National Register–eligible by the SHPO, due to its contributions to the patterns of development and transportation in Florida. The segment within the project APE, constructed circa 1927, maintains its original route and historic integrity. It also would be considered a contributing segment to a linear historic district, should this railroad ever be evaluated comprehensively.

The North Woodlawn Cemetery is located adjacent to the eastern side of I-95, south of Sunrise Boulevard. The extant portion of the cemetery is 4.1 acres in size; however, no definitive records indicating the original boundaries are available. This cemetery is considered eligible for listing in the National Register for significance on the local level under Criterion A in the area of ethnic heritage and under Criterion D for its association with historic events. It was established during the 1920s when the African-American community was restricted to the northwest quadrant of Fort Lauderdale, and thus was the only cemetery African-Americans, including many important leaders in the early settlement of the City, could be buried in until 1962. North Woodlawn Cemetery represents a rare, remaining resource associated with Fort Lauderdale's African-American community during the period of segregation. A Determination of Eligibility (DOE) was prepared for this resource and included in the CRAS.

For the Dania Canal, Middle River Canal, and Griffin Road, only the small portions of each of these linear historic resources located within the project APE near their intersection with I-95 were surveyed. All were constructed beginning in circa 1913. The portions of the two canals within the APE do not have any distinguishing engineering features, and both canals were previously determined ineligible for listing in the National Register by the SHPO. Although Griffin Road represents an early twentieth century road in south Florida, there are no remaining features indicating that the road is historic within the project APE. Also, the SHPO concurred in 2008 that due to the short length of another segment of Griffin Road surveyed four miles to the west, there was insufficient information to make a determination of eligibility. Because the project APE includes an even smaller section of roadway, there remains insufficient information with which to make an accurate determination of eligibility for this section of roadway as well.

In addition to the CRAS, a historic resources reconnaissance survey was performed to provide preliminary cultural resource information for areas outside the established APE, adjacent to the I-95 R/W. This survey resulted in the identification of four previously recorded historic resources: *Link Trainer Building (8BD2562)*, National Register–listed; *Seaboard Air Line Railroad Station (8BD1452)*, National Register–eligible; *CSXT Railroad Bridge (8BD3340)*, National Register–eligible; and *Dania Canal Railroad Bridge (8BD3220)*, ineligible for the National Register. Regarding the

Seaboard Air Line Railroad Station, a portion of the non-historic platform and associated structures are located within the R/W; however, the historic station itself is outside of the R/W. Although the Dania Canal Railroad Bridge was determined ineligible for the National Register by the SHPO in 1999, this resource should be reevaluated, as it is likely a contributing resource to a potential Seaboard Air Line/CSX Railroad linear historic district.

To fulfill Section 106 requirements, a Cultural Resource Committee was formed, with representatives from FHWA, SHPO, FDOT, and local community members. Through this process, important information was obtained concerning the history of North Woodlawn Cemetery and its historically associated potter's field. In addition, coordination with the Broward County Historic Preservation Coordinator occurred.

The CRAS was submitted to the FHWA for transmittal to the SHPO, who provided eligibility concurrence on March 27, 2013. Subsequently, the request for Section 106 Determination of Effects for Woodlawn Cemetery was submitted to the FHWA for transmittal to the SHPO; both the FHWA and SHPO provided concurrence (June 17 and 24, 2013) that the Recommended Alternative will have no adverse effect on the National-Register eligible North Woodlawn Cemetery. A second Section 106 Determination of Effects for the Seaboard Airlines/CSX Railroad was submitted to FHWA on August 7, 2013 for transmittal to the SHPO. The FHWA and the SHPO provided concurrence on August 22 and 28, 2013, respectively, that the Recommended Alternative will have no adverse effect on the National-Register eligible Seaboard Airlines/CSX Railroad. Through the application of the Criteria of Adverse Effect, the FHWA in consultation with the SHPO determined that the project did not constitute an adverse effect on any of the properties. Based on the fact that no additional archaeological or historical sites or properties are expected to be encountered during subsequent project development, the FHWA has determined that no other National Register properties would be impacted.

6.10.4.2 Archaeological Sites

Archeological testing occurred within the APE in the four documented archaeological zones (Stirling Road, Ravenswood, New River South Fork, and North Bank New River), as well as other areas of concern identified by the Broward County Archaeologist. Subsurface testing could not be conducted within most of the areas identified (due to the presence of paved roads, buried utilities, and road berms, and landscaping). Minimal testing was conducted within the R/W adjacent to/west of North Woodlawn Cemetery, in the area within the reported extent of the original cemetery. All tests were negative, and no evidence of human remains was found during the testing. The potter's field lies under the northbound lanes of I-95 and the R/W adjacent to the extent cemetery, thus there is a possibility that there are unmarked graves within the R/W.

As a result of the CRAS, no newly recorded archaeological sites were identified within the APE. In addition, all previously recorded archaeological sites are located outside of the APE. Therefore, no impacts to archaeological resources are anticipated as a result of the project. Coordination (by FHWA) with the Seminole Tribe of Florida's Tribal Historic Preservation Officer (THPO) will occur to notify them of the results of the CRAS.

6.10.5 Section 4(f)

Four parks occur in proximity to the project corridor: Easterlin Park, owned by Broward County, and Osswald, Mills Pond, and Flamingo Parks, owned by the City of Fort Lauderdale. For all four parks, there will be no R/W acquisition, and access will be maintained during construction. Easterlin Park (formerly known as Cypress Park), the County's first inland regional park, is 46.6 acres in size and primarily functions as a campground. Other amenities include a nature trail, scenic lake, disc golf course, volleyball, playground, picnic shelter, and picnic tables/grills. This park is located to the west of I-95, at 1000 NW 38 Street (off Oakland Park Boulevard). Osswald Park, a community park, is 30.9 acres in size. Various amenities and activities include a splashpad, recreation center, pavilions, playground, lighted athletic fields, tennis/racquetball courts, basketball courts, shuffleboard, volleyball, walking/jogging trail, golf, and a picnic area. This park is located to the west of I-95, at 2220 NW 21 Avenue (off Oakland Park Boulevard). Mills Pond Park, an urban city park, is 152.5 acres in size. A number of amenities and activities are offered, including: lighted athletic fields (baseball/softball/football), batting cages, water skiing, an open play area, fishing, a recreation center, concessions, pavilions, picnic area/grills, and a playground. This park is located to the east of I-95, at 2201 NW 9 Avenue (off Oakland Park Boulevard). Flamingo Park, a neighborhood park, is 3.0 acres in size. Within this small, passive park, only limited activities are available - an open play area, playground, and a picnic area. This park is located at 1600 SW 21 Way (off Davie Boulevard), to the west of and adjacent to southbound I-95, separated by a frontage road.

The following is a description of the results of the noise analysis that was conducted for the Recommended Alternative, regarding potential impacts to each of these four parks:

Easterlin Park: This park is located to the west of I-95 and west of the SFRC. Design year traffic noise levels at the park are predicted to range from 65.7 to 66.2 dB(A), approximately 0.5 dB(A) greater than existing traffic noise levels. Only 20 of the 45 total campsites were predicted to be impacted by the project. Based on the noise analysis conducted for the Recommended Alternative, noise impacts will result from the project in this area. A 20 to 22 foot tall noise barrier was evaluated to mitigate these noise impacts. Cost reasonableness of this noise barrier was evaluated using campground usage data provided by the Broward County Parks and Recreation Division and the FDOT's methodology for determining cost reasonableness for special land use sites as described in the report *A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations* (Updated July 22, 2009). Although it was found that such a noise barrier would meet all of the FDOT's feasibility and noise level reduction requirements, it was determined that usage of the campground is well below a level sufficient to meet the cost criterion for construction of a noise barrier at this location. Therefore, a noise barrier was determined to be "not reasonable" and is not recommended. More specific information regarding the noise barrier evaluation for this campground may be found in the project's Noise Study Report (NSR).

Osswald Park: This park is located to the west of I-95 and west of the SFRC. It is bounded to the west by local roads. Any potential visual or noise impacts are existing, and no project improvements are proposed that would further impact this site. The golf course is located closest to I-95. Design year traffic noise levels at the golf course are predicted to range from 64.5 to 65.7 dB(A), approximately 1.3 dB(A) greater than existing traffic noise levels. Based on the noise analysis conducted for the Recommended Alternative, noise impacts will not result from the project in this area. Therefore, no direct or constructive use of this park under Section 4(f) is anticipated.

Mills Pond Park: This park is located to the east of I-95. Design year traffic noise levels at the park are predicted to range from 66.8 to 70.8 dB(A), approximately 1.3 dB(A) greater than existing traffic noise levels. Based on the noise analysis conducted for the Recommended Alternative, noise impacts will result from the project in this area. A 14 to 22 foot tall noise barrier was evaluated to mitigate these noise impacts. Cost reasonableness of this noise barrier was evaluated using park usage data provided by the Broward County Parks and Recreation Division and the FDOT's methodology for determining cost reasonableness for special land use sites as described in the report *A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations* (Updated July 22, 2009). Although it was found that such a noise barrier would meet all of the FDOT's feasibility and noise level reduction requirements, it was determined that usage of this property is well below a level sufficient to meet the cost criterion for construction of a noise barrier at this location. Therefore, a noise barrier was determined to be "not reasonable" and is not recommended. More specific information regarding the noise barrier evaluation for this park may be found in the project's NSR.

Flamingo Park: This park is adjacent to southbound I-95, separated only by a frontage road. It is bounded on nearly all sides by local roads or I-95; the parking area and access is at the local street level, i.e., below elevated I-95. Any potential visual or noise impacts are existing, and no project improvements are proposed that would further impact this site. The additional lane being added within this segment of I-95 is within the mainline structure, i.e., the edge of pavement of the adjacent southbound CD road will not be moved any closer to the park. No modifications are proposed to the existing low-level noise barrier for the rail along the elevated shoulder of the southbound CD road. Design year traffic noise levels in this park are predicted to range from 60.3 to 60.8 dB(A), approximately 0.4 dB(A) greater than existing traffic noise levels. Based on the noise analysis conducted for the Recommended Alternative, noise impacts will not result from the project in this area. Therefore, no direct or constructive use of this park under Section 4(f) is anticipated.

For all four parks, there will be no R/W acquisition, and access will be maintained during construction. No other short term or long term impacts from the project would affect the activities or attributes of these parks. The potential applicability of Section 4(f) to the four parks was presented to the FHWA on February 26, 2013, where the FDOT concluded that Section 4(f) would not be applicable to any of these parks. The FHWA's concurrence of no project involvement with Easterlin, Osswald, Mills Pond, and Flamingo Parks was provided on May 6, 2013.

6.10.6 Noise and Air Analysis

6.10.6.1 Noise

A **Noise Study Report (NSR)** was prepared for the project in accordance with 23 CFR 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise* dated July 13, 2010 and Chapter 335.17, Florida Statutes. Approximately 957 first and second-row residential noise sensitive sites were identified along the project corridor. Also, 16 non-residential noise sensitive sites, including religious facilities, parks, and pools at hotels/apartment complexes were identified. Traffic noise levels were predicted for noise sensitive locations along the project corridor for the existing conditions and the design year (2040) No-Build and Build Alternative.

Design year traffic noise levels at residences along the corridor are predicted to range from 52.6 to 75.2 dB(A) (A-weighted decibels) with the Build Alternative. The design year noise levels with the project are predicted to be no more than 1.4 dB(A) greater than the existing noise levels. The Build Alternative noise levels at Special Use Sites are predicted to range from 57.6 dB(A) at an apartment complex pool to 79.4 dB(A) at the North Woodlawn Cemetery. With the Build Alternative, noise levels are predicted to exceed the Noise Abatement Criteria (NAC) at 182 residences along the project corridor and at four special use areas. No other noise sensitive sites within the project study area are predicted to experience traffic noise levels equal to or exceeding the FDOT NAC. Also, no sites are expected to experience any substantial noise level increases as defined by the FDOT [i.e., greater than 15.0 dB(A) over existing levels] with the Build Alternative.

On March 13, 2012 FDOT staff and their traffic noise representative met with the Shady Banks HOA President to measure noise levels in the neighborhood and to explain the FDOT noise process. Traffic noise levels were measured at her home at 1524 SW 19th Avenue and in front of another nearby home located closer to I-95. Traffic noise levels were measured between approximately 9:00 and 10:30 AM and were found to be approximately 62 dB(A) at the HOA president's home and 64 dB(A) at the other nearby home.

FDOT policy requires that the reasonableness and feasibility of noise abatement be considered when the FHWA NAC is approached or exceeded. In accordance with traffic noise study requirements set forth by both the FHWA and FDOT, noise barriers were considered for all noise sensitive receptor sites where design-year traffic noise levels were predicted to equal or exceed the NAC.

A wide range of factors are used to evaluate the feasibility and reasonableness of noise abatement measures. Feasibility primarily concerns engineering considerations including the ability to construct a noise barrier using standard construction methods and techniques. Feasibility also concerns the ability to provide a noise level reduction of at least 5 dB(A) for two or more impacted receivers given certain access, drainage, utility, safety, or maintenance requirements. Reasonableness implies that common sense and good judgment were applied in a decision related to noise abatement. Reasonableness includes the consideration of the cost of providing noise abatement. To be deemed reasonable, a noise barrier or other noise abatement measure must not exceed the FDOT's reasonable cost criteria of $42,000 per benefited receptor site and must attain the FDOT noise reduction design goal of 7 dB(A) at one or more impacted receptor sites. In addition, once the noise abatement measure has been determined to be reasonable and feasible, the viewpoint of the benefited property owners must be considered.

To facilitate the noise barrier analysis, contiguous noise sensitive areas were grouped together into one of 13 Common Noise Environments (CNE). A CNE represents a group of impacted receptor sites that would benefit from the same noise barrier or barrier system (i.e., overlapping/continuous barriers) and are exposed to similar noise sources and levels, traffic volumes, traffic mix, speeds and topographic features. Generally, CNEs occur between two secondary noise sources, such as interchanges, intersections and/or cross-roads. In addition, the primary method for determining the cost of noise abatement involves a review of the cost per benefited receptor site for the construction of a noise barrier benefiting a single location or CNE (e.g., a subdivision or contiguous impact area).

Many of the locations where noise impacts are predicted to occur are near existing noise barriers. In these cases, alternatives such as increasing the length of an existing noise barrier or filling in gaps in noise barrier coverage were selected, since increasing the height of an existing noise barrier is not possible without completely replacing the noise barrier with a new taller noise barrier. (Refer to NSR for detailed tables and figures, summarizing the results of the noise barrier analyses and recommendations for each of the locations where noise barriers were evaluated, as well as figures of locations where noise barriers were evaluated or planned.)

A noise barrier for one CNE meets all of the FDOT's noise barrier feasibility and reasonableness requirements and is recommended for further consideration and public input. This noise barrier, CNE-W4, is recommended for the Franklin Park neighborhood south of Sistrunk Boulevard. The recommended location for this noise barrier is along the shoulder of the southbound lanes, although an alternative location along the west side of the adjacent railroad corridor is also under consideration. FDOT staff attended a meeting of the River Garden Sweeting Estates Homeowners Association in the Franklin Park community on January 28, 2013 to explain the FDOT traffic noise process and to respond to the community's requests for noise abatement. The meeting was arranged by State Senator Smith and attended by his aide, Sharonda Wright-Placide. It is expected that further coordination with this community will occur as the project progresses through design in order to determine the most favorable noise barrier for this community. Depending upon location, at least 43 of the 48 nearby impacted residences are expected to be benefited by the noise barrier design concepts being considered. The cost per benefited site of these concepts ranges from $12,893 to $16,053, which is within FDOT's noise barrier cost criteria. Also, either design concept will meet FDOT's noise reduction design requirement of 7 dB(A) at one or more sites.

It is likely that the noise abatement measure for the location identified above will be constructed if found feasible based on the contingencies listed in the project's NSR. If, during the Final Design phase, any of the contingency conditions listed above cause abatement to no longer be considered reasonable or feasible for this location, such a determination will be made prior to requesting approval for construction advertisement. Commitments regarding the exact abatement measure locations, heights, and type (or approved alternatives) will be made during project reevaluation and at a time before the construction advertisement is approved.

The cost to construct noise barriers for the following residential neighborhoods exceeded FDOT's reasonable cost criteria of $42,000 per benefited site:

- **CNE-E1** - Lauderdale Lakes ($155,100 per benefited site); and,
- **CNE-E4** - Unnamed neighborhood ($87,000 per benefited site).

Based on the usage rates provided by the agencies overseeing the following sites, or in the case of CNE-E5, on the usage necessary to be considered cost reasonable, construction costs for noise barriers were determined to exceed FDOT's reasonable cost criteria for special land use sites at the following locations:

- **CNE-E5** - Woodlawn Cemetery (>$995,935/person-hr/square-foot);
- **CNE-E7** – Mills Pond Park (>$995,935/person-hr/square-foot); and,
- **CNE-W5** – Easterlin Park (>$995,935/person-hr/square-foot).

It was not possible to provide at least a 7 dB(A) noise level reduction at the following locations. There these noise barriers were determined to not be reasonable according to FDOT noise level reduction requirements:

- **CNE-E2** - Marina Oaks apartments [4.3 dB(A) maximum noise level reduction];
- **CNE-E3** - Shady Banks [4.0 dB(A) maximum noise level reduction];
- **CNE-W2** - Marina Bay apartments [5.0 dB(A) maximum noise level reduction];
- **CNE-W3** - Holland Mobile-home Park [5.8 dB(A) maximum noise level reduction];
- **CNE-E6** – Lauderdale Manor [3.7 dB(A) maximum noise level reduction]; and,
- **CNE-E8** – Jenada Isles [2.4 dB(A) maximum noise level reduction].

Therefore, noise barriers were not recommended for further consideration or construction at these locations. Several of the noise barriers that were not recommended are adjacent to neighborhoods that already have nearby existing noise barriers, so it was not possible to further reduce noise levels enough to meet either FDOT's noise level reduction criteria [7 dB(A)] or the reasonable cost criteria. Based on the noise analyses performed to date, there are no apparent solutions available to mitigate the noise impacts at these locations. The traffic noise impacts to these noise sensitive sites are considered to be an unavoidable consequence of the project.

The FDOT is committed to the construction of feasible noise abatement measures at the locations where noise barriers have been recommended for further consideration during the final design phase, contingent upon the following conditions:

- *Detailed noise analyses during the final design process support the need for abatement;*
- *Reasonable cost analyses indicate that the economic cost of the barrier(s) will not exceed the cost reasonable criterion;*
- *Safety and engineering aspects as related to the roadway user and the adjacent property owner have been reviewed and any conflicts or issues resolved;*
- *Community input regarding desires, types, heights and locations of barriers has been solicited by the FDOT; and*
- *Any other mitigating circumstances found in Section 17-4.6.1 of FDOT's PD&E Manual have been analyzed.*

During construction of the project, there is the potential for noise impacts to be substantially greater than those resulting from normal traffic operations because heavy equipment is typically used to build roadways. In addition, construction activities may result in vibration impacts. Therefore, early identification of potential noise/vibration sensitive sites along the project corridor is important in minimizing noise and vibration impacts. The project area does include residential, institutional and commercial areas including hotels, schools and nearby churches. Construction noise and vibration impacts to these sites will be minimized by adherence to the controls listed in the latest edition of the FDOT's *Standard Specifications for Road and Bridge Construction*.

A reassessment of the project corridor for additional sites particularly sensitive to construction noise and/or vibration will be performed during design to ensure that impacts to such sites are minimized. Coordination between the FDOT and the operators of any construction noise/vibration sensitive locations identified during design should occur and TSPs should be developed for the project's contract package in order to ensure that impacts to such businesses are minimized.

6.10.6.2 Air Quality

An **Air Quality Technical Memorandum** was prepared for the project. The project corridor consists of primarily transportation land use, with sizable areas of residential, commercial and industrial land uses along both sides of the project corridor. The residential properties are considered to be potentially more sensitive to changes in air quality than the large tracts of commercial and industrial properties that are also located along I-95.

The proposed project has the potential to alter traffic conditions and influence the air quality within the project study area. Potential air quality impacts in the area surrounding the project corridor were assessed for all viable project alternatives, including the No-Build Alternative, in accordance with applicable FHWA guidelines and guidelines contained in the FDOT PD&E Manual, Part 2, Chapter 16.

The project's No Build and Build Alternatives were assessed for potential air quality impacts at the project level using the FDOT's PC-based CO Florida 2012 screening model. The Carbon Monoxide (CO) screening analysis for this project indicates that the worst-case one-hour CO level is 9.4 parts per million (ppm) during the build year and 9.6 ppm during the project's design year. The predicted worst-case eight-hour CO level is estimated to be 5.8 ppm during the build year and during the project's design year. The results of the CO screening analysis indicate the proposed project is not expected to cause any exceedances of the one-hour or eight-hour National Ambient Air Quality Standards (NAAQS) for CO. Thus, the project passes the CO screening analysis, and air quality impacts resulting from the proposed project are not expected.

Air quality impacts are not expected to occur as a result of this project. The South Florida region is currently in attainment for all of the pollutants for which NAAQS have been developed. As of June 2005, Broward County is located in an area which is designated as attainment for all of the NAAQS under the criteria provided in the Clean Air Act. Therefore, the project is located in an area which is designated as attainment under the criteria provided in the Clean Air Act; the Clean Air Act conformity requirements do not apply to the project.

Construction activities for the proposed action may potentially have short-term air quality impacts within the immediate vicinity of the project. Construction activities may generate temporary increases in air pollutant emissions in the form of dust from earthwork and unpaved roads and smoke from open burning. Such emissions and potential impacts will be minimized by adherence to all applicable State and local regulations and to the FDOT *Standard Specifications for Road and Bridge Construction.*

6.10.7 Contamination

A **Contamination Screening Evaluation Report (CSER)** was prepared for the project and is on file at FDOT District 4. The CSER provides the results of a detailed Level I evaluation of the project area, and defines the potential risks from soil or groundwater contamination. The evaluation method was developed in coordination with District Four PL&EM staff, and consisted of those properties within and adjacent to I-95, as well as any "adjacent +1" properties (i.e., the next properties away from the corridor, having known storage tank or contamination, that are adjacent to/contiguous with the properties immediately adjacent to the corridor).

This proposed project contains no known significant contamination. As a result of the CSER, over 250 sites were identified as potential hazardous material generators for the project. Of those sites determined to have a high or medium risk of potential involvement with the project, 18 are located within the current R/W. These CSER sites include an EPA National Priority List (NPL) site and five Brownfields (e.g., landfills), as well as vehicular accidents/spills and the Fort Lauderdale-Hollywood International Airport. In addition, asbestos containing materials (ACMs) testing and lead-based paint surveys were conducted on 60 and 30 bridges, respectively. No positive ACMs or hazardous concentrations of lead-based paint were detected; however, lead was identified at non-hazardous concentrations in all but one of the bridge paints tested.

No R/W acquisition is currently anticipated from any of the adjacent and "adjacent+1" properties. However, subsurface excavation work, including construction or modification of stormwater drainage areas, is proposed to occur within the R/W adjacent to most of the High and Medium Risk sites; therefore, the project has the potential for involvement with contamination within the I-95 R/W.

Based on the fact that a High or Medium Risk for soil and/or groundwater contamination has been documented for at least 50 locations in the vicinity of the project corridor, a Level II Contamination Assessment investigation is warranted during the final design phase for the High and Medium Risk sites adjacent to the proposed construction areas of the Recommended Alternative, including any proposed drainage areas outside the FDOT R/W, to confirm the existence of soil and/or groundwater contamination at these sites. Additionally, these sites pose a dewatering concern based on their proximity to the project corridor.

If dewatering will be necessary during construction, a SFWMD Water Use Permit will be required. (The project may not qualify for a SFWMD "No Notice" Dewatering Permit, because it is located within one mile of a landfill.) The Contractor will be held responsible for obtaining and ensuring compliance with any necessary dewatering permit(s). Any dewatering operations in the vicinity of potentially contaminated areas shall be limited to low-flow, short-term. A dewatering plan may be necessary to avoid potential contamination plume exacerbation. All permits will be obtained in accordance with Federal, State, and local laws and regulations.

Additionally, Section 120 Excavation and Embankment – Subarticle 120.1.2 Unidentified Areas of Contamination of the FDOT Standard Specifications for Road and Bridge Construction will be provided in the project construction contract documents. This specification requires that in the event that any hazardous material or suspected contamination is encountered during construction, or if any spills caused by construction-related activities should occur, the Contractor shall be instructed to stop work immediately and notify the District Four PL&EM Office as well as the appropriate regulatory agencies for assistance.

6.11 Bridge Analysis

Under the Recommended Alternative, bridge structures at eight locations will be widened and one twin-bridge will be replaced. **Table 6-17** presents a summary of these structures. Refer to the **Bridge Analysis Report** on file at FDOT District 4 for more details on these bridges.

Table 6-17
Proposed Bridge Characteristics - Recommended Alternative

#	Location	Bridge Numbers	Existing Bridge Width (ft.)	Proposed Bridge Width (ft.)	Min. Vert. Cl. (ft.)	Bridge Length (ft.)	Proposed Improvement
3	I-95 over Griffin Road (SR 818)	860554 (SB)	85.625	100.875	16.10	180	Widening
4		860555 (NB)	85.625	100.875			Widening
5	I-95 over Dania Cut-off Canal	860109 (SB)	Varies from 88.208 to 91.177	96.75	11.33 (MHW)	180.3	Widening
6		860209 (NB)	96.625	112.75			Widening
43	SB I-95 to Broward Boulevard (SR 842) over North Fork New River	860260	51	Varies from 46.88 to 49.896	6.89 (MHW)	155	Widening
44	I-95 over North Fork New River	860270 (SB)	93.6	95.08	6.35 (MHW)	250	Widening
45		860271 (NB)	88.04	Varies from 94.08 to 97.042	7.55 (MHW)	207	
47	I-95 over NW 6 St	860272 (SB)	97.08	Varies from 219.33 to 224.00	16.35	158.6	Widening - bridges to be united
48		860273 (NB)	109.08				
52	I-95 over NW 19 St	860115	98.625	229.083	14.78	191.6	Replacement
53		860215	98.625				
54	I-95 over C-13 Canal	860116	Varies from 99.719 to 101.594	124.875	6 (MHW)	108	Widening
55		860216	98.708	112.875			Widening
56	I-95 over Oakland Park Boulevard (SR 816)	860117	94.61	112.875	15.05	253.8	Widening
57		860217	94.61	112.875			Widening

6.12 Landscaping / Greening Gateways

Greening Gateways

Landscaping beautification at the interchanges along I-95 also labeled "Greening Gateways" are present at the I-95 interchanges with Broward Boulevard (SR 842), Sunrise Boulevard (SR 838), and Oakland Park Boulevard (SR 816). These smart landscape designs emphasize native plant communities with low water needs. These greenway areas will be modified in order to accommodate the storm water management needs within the existing Limited Access Right of Way. The design of the ponds at these interchanges will focus on minimizing impacts to existing landscaping while creating an aesthetically pleasing water feature. A commitment has been included that consideration will be given to the preservation or relocation of existing landscaping and/or inclusion of new landscaping during final design. This will be done in collaboration with the Broward Metropolitan Planning Organization and local jurisdiction. The Study Team met with Greening Gateways Committee on March 14, 2013 to discuss this issue. The Committee understood the needs of the study and requested to stay involved during final design. Further coordination during the next phase is recommended.

6.13 Special Features

The following is a description of the special features of the Recommended Alternative such as noise barriers, intelligent transportation systems, and entry/exit points of the Express Lanes.

6.13.1 Noise Barrier

A **Noise Study Report (NSR)** has been prepared as part of this study and is on file at FDOT District 4. This traffic noise study was performed in accordance with the Code of Federal Regulations Title 23, Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise and Title XXVI Chapter 335.17 of the Florida Statutes using the methodology established in the Florida Department of Transportation's (FDOT) Project Development and Environment (PD&E) Manual, Part 2 Chapter 17 (Last updated May 24, 2011). A noise barrier is recommended for further consideration and public input at one location, CNE-W4 – the Franklin Park neighborhood.

6.13.2 Intelligent Transportation Systems

The development of the ITS infrastructure is not included in the scope of this PD&E. However, through preliminary coordination with FDOT District 4 and the Florida's Turnpike Enterprise, several guiding principles can be identified that will determine the ultimate ITS configuration:

- The existing ITS infrastructure investment should be evaluated for its utility to remain part of the newly constructed improvements
- The existing ITS infrastructure must remain in service for real-time traffic management during the development of the project improvements

- The existing and/or new ITS infrastructure must provide full support of the general purpose and Express Lanes operations in harmony with the tolling systems and potential active traffic management (ATM) systems that could be implemented.
- A systems engineering approach should be utilized throughout the process based on a concept of operation, functional requirements, systems engineering design, acceptance testing and Operations and Maintenance (O&M) planning.

A more detailed ITS analysis will be performed during the conceptual design phase likely as part of a design-build criteria package that will identify conflicts with proposed roadway features and existing ITS Infrastructure. The final ITS and Tolling System configuration will be determined in the final design phase, detailing the quantity, location, specification and implementation requirements for each device.

6.13.3 Entry/Exit Points of Express Lanes

The preliminary access points were determined based on the Corridor Planning Study performed by Reynolds, Smith and Hills, Inc. in 2010. This Planning Study identified the Express Lanes feasible access locations that serve major home to work trips pairs and provide connections to multimodal facilities. These access points are being refined taking into account the public input, results of the analysis of the design traffic and geometric and right of way constraints. As stated above, there could be four access points within the limits of this project. **Figure 6-13** shows preliminary entry and exit points for the I-95 express corridor from Stirling Road (SR 848) to Northlake Boulevard.

Figure 6-13
Potential Entrance/Exit Locations to Express Lanes

6.13.4 Broward County Aviation

A coordination meeting with Broward County Aviation Department (BCAD) was held on February 7, 2013 to gather their concerns and input for the project. The following is a summary of the key points from the meeting:

- **Preference for a direct connection between the Express Lanes and I-595 to serve the airport patrons.** The current plan does not provide a southbound exit from the Express Lanes to the Fort Lauderdale Airport. The airport patrons travelling southbound on the Express Lanes north of Oakland Park Boulevard can exit to the general purpose lanes at this location or can exit at the Broward Boulevard Park and Ride and use local roadways to reach the airport. FDOT will evaluate a direct connection with I-595 as part of a separate study.
- **Adequate signage** - BCAD wanted to ensure that their patrons had adequate advance signage to advise them when they had to leave the express lane system to be able to access the airport (in both directions).
- **New Airport Glide Path** –Based on the design provided by the I-95 Phase 2 design team, four sign structures may be in conflict with the new glide path. Coordination efforts were undertaken with the I-95 Phase 2 design team in order to resolve several conflicts with proposed sign structures and the airport new glide path. BCAD recommended continued coordination with this project throughout the process to avoid any conflicts with any new sign structures proposed and the new glide path.

As a result of this meeting, a commitment will be included in this PER stating that FDOT will coordinate with BCAD throughout design and construction to avoid any conflicts with the new glide path and ensure that the express and general purpose lanes are adequately signed and provide clear and concise messages to the airport patrons from both north and south.

6.14 Access Management

I-95 is a limited access facility with an Access Class 1, Area Type 1, under the FDOT Access Management Classification System. The minimum interchange spacing allowed is 1 mile. There are eight interchanges within the project limits. No access management modifications are proposed under the Recommended Alternative.

6.15 Value Engineering Summary

A Value Engineering (VE) review was conducted during the week of December 3 - 7, 2012. The primary purpose of the VE review is to conduct a thorough review and analysis of the key project issues using a multidiscipline, cross-functional team. Subsequently, a Value Engineering Report was developed documenting the VE recommendations. Based on this report, the VE team made 6 recommendations for this study. The PD&E Study Team analyzed these recommendations and developed responses. The **VE Study Report** and the **Responses to VE Recommendations** are on file at FDOT District 4. A summary of the VE team recommendations and the PD&E Study Team responses are provided in **Table 6-18**.

Table 6-18
Response to Value Engineering Recommendations

VE Recommendations		PD&E Study Team Response
1	**Stirling Road Bridge** – Leave the Stirling Bridges as built in the Phase 2 project (11' express lanes, 3' buffer, 11' inside general purpose lane).	**Response – This VE recommendation will be implemented.** The PD&E Study Team originally proposed a 5-ft widening for the bridges over Stirling Road to address discussions held between FDOT and FHWA to provide a standard typical section (12-foot lanes & shoulders) wherever practical. In order to achieve the standard typical section, the I-95 bridges over Stirling Road would need to be widened 5-feet on each side. However, the PD&E Study Team concurs with this recommendation. This is essentially a transition section from Phase 2 to the PD&E and the limits of this study were set to Stirling Road for tie-in purposes. These bridges are currently being widened as part of the I-95 Phase 2 construction project. Benefits would include improving public perception (spending additional tax payer money and inconvenience to the public to widen a bridge that is already being widened under the current construction project for Phase 2), reducing construction costs, and providing continuity between I-95 Phase 2 and this 3,000-ft segment of the project which is included for transition/tie-in purposes.
2	**NW 19 Street Bridges -** Replace only the bridge superstructure over 19th Street (perhaps only the middle span, depending on load rating deficiency). Increase vertical clearance on NW 19th Street without raising bridge profile by using thinner FIB spaced closer together.	**Response – This VE recommendation will not be implemented during the PD&E phase but can be further analyzed during they design phase.** There are two reasons why these bridges are recommended for replacement: 1) existing vertical clearance is substandard (surveyed at 14.78-feet) and 2) existing load rating is less than 1.0 (0.833). The existing vertical clearance is below the minimum AASHTO criteria for vertical clearance over a roadway which is 16-feet. Based on a field review, the bridge superstructure appears to have been hit. Additionally, the PD&E Team will be performing load ratings on all bridges to be replaced or widening. A final decision on whether to widen or replace will be made once this analysis is complete. If the bridge load ratings are acceptable, the bridges can be widened and a variation can be requested for vertical clearance. The VE team recommendation would only raise the vertical clearance to 15'-5" which is below the minimum requirements from AASHTO. A design exception will still be required. Furthermore, the new FIB-girders are much heavier than the existing AASHTO beams. Additional dead loads would be added if a step was placed on the cap due to the difference in beam heights. The existing substructure would have to be further analyzed for this condition as also acknowledged by VE Team. This type of evaluation is typically performed during the Bridge Development phase and documented in the Bridge Development Report. Further evaluation is recommended during the final design phase.
3	**Profile Pivot Point -** Leave profile pivot point at its current location and, if necessary, plane and change slope to outside.	**Response – This VE recommendation will not be implemented.** The VE typical section configuration would not comply with FDOT requirement for the number of lanes slopping in the same direction. In addition, the PD&E design is intended to maintain uniformity and provide consistency between the various I-95 segments to ensure driver expectancy. The typical sections cross sectional features were designed to achieve this vision and meet the Department standards. Slopping the express lanes toward the median is consistent with the typical section of I-95 Phase 2 approved by the Department and currently under construction. Shifting the profile grade point of I-95 is similar to the Phase 2 design. This approach will not require a significant amount of overbuild as suggested by the VE Team. An average of 2.5 in of overbuild over a 5.5 mile segment of I-95 will be required because widening/reconstruction will occur in the median for the remainder of the corridor. The vertical clearances of underpasses will not be an issue impeding the implementation of the PD&E Study Team proposal. Under the proposed improvements, the underpasses are treated as constrained segments where the inside shoulders are reduced to a minimum 3-ft and the managed lanes set to 11-ft to avoid impacting these bridges. As a result, it will not be necessary to shift the pivot point of I-95 under the overpasses. No drainage issues in the median due to additional flow are expected. The PD&E Study Team performed a preliminary spread analysis for a sample segment using worst case conditions, which assumed two 12-ft lanes, an 11-ft shoulder, a longitudinal slope of 0.1%, and inlet spacing of 400 ft. The analysis shows an estimated spread of 6.1-ft within the 11-ft shoulder. As such, we do not anticipate problems from spread if two 12-ft lanes are sloped towards the median.
4	**Emergency Pullouts -** Emergency pullouts in constrained areas (outside shoulder).	**Response – This VE recommendation will not be implemented.** Approximately 4 miles within this 9 mile corridor are considered constrained. In these areas, the standard typical section elements are reduced in order to accommodate the proposed typical section without impacting bridges or existing interchanges. As such, there is no room to place any emergency pullouts within this segment. As for the other segment, the available space is needed to handle the drainage needs of the corridor without requiring right of way for off-site ponds. Vehicles needing to pull over can safely do so using the standard paved and unpaved shoulders proposed for these segments.

Table 6-18
Response to Value Engineering Recommendations

	VE Recommendations	PD&E Study Team Response
5	**Sunrise Interchange -** Combine northbound/ eastbound ramp with northbound/westbound loop ramp at Sunrise (reconstruct the ramp intersection at Sunrise). Remove existing northbound off-ramp to eastbound Sunrise. Urbanize the northbound/eastbound movement.	(see below)
6	**One Express Lane from Stirling Road to Broward Boulevard -** Reduce to one express lane in each direction from Stirling Road to Broward Boulevard (SR 842).	(see below)

5 – PD&E Study Team Response

<u>Response – This VE recommendation will not be implemented.</u>
The VE recommendation combines the northbound/eastbound ramp with northbound/westbound loop ramp at Sunrise Boulevard. It would remove the existing northbound off-ramp to eastbound Sunrise Boulevard which is operating in free-flow conditions. Even though this recommendation has a different layout than a similar design proposed by the PD&E Study Team, it results in a similar traffic operation since all the traffic from both ramps will be forced to use a one lane ramp with a single deceleration lane. This issue was even recognized in the text of the VE recommendation: "would need to study ramp because this may need a dual lane". A dual lane ramp under this alternative would impact the North Woodlawn Cemetery by requiring widening towards the cemetery. The proposed Build Alternative avoids widening by matching the existing edge of pavement and providing a constrained typical section. It also maintains the current operation of the interchange.

Highway Capacity Software (HCS) analysis performed for the ramp of Alternative 2B, the VE recommendation will fail as early as 2020 for both the AM and the PM peak periods. The table below provides a summary of the HCS analysis of the ramp.

	AM				PM			
Year	**Volume Freeway (veh/h)**	**Volume Ramp (veh/h)**	**Density (pc/mi/ ln)**	**LOS**	**Volume Freeway (veh/h)**	**Volume Ramp (veh/h)**	**Density (pc/mi/ ln)**	**LOS**
2020	9,525	1,695	38.0	F	9,602	1,871	39.2	F

The VE recommendation eliminates the existing off-ramp to eastbound Sunrise Boulevard and requires a new approach / left turn at the ramp terminal signalized intersection. This new left turn movement, which corresponds to 1,062 (1,091) veh/hr during the AM and PM peak hours for 2020, will most likely create challenges for the traffic operation of the intersection.

Northbound to eastbound and northbound to westbound traffic streams are currently operating in a free flow condition with separate auxiliary lanes feeding each travel movement. This facilitates queuing of vehicles. Combining the two ramps will deteriorate traffic operations in the area and could result in safety issues associated with added congestion and a new left turn at the ramp terminal signal.

This ramp modification would also require an Interchange Modification Report (IMR).

6 – PD&E Study Team Response

<u>Response – This VE recommendation will not be implemented.</u>
The VE Team mentioned that this recommendation was contingent to future traffic. Two Express Lanes are needed in each direction for these limits. The following table summarizes the DDHV or peak hour volumes calculated from the travel demand model and documented in the Design Traffic Technical Memorandum reviewed by FDOT. The cells in red highlight the sections that would be operating "over capacity". As shown in the table the express lane have estimated volumes higher than capacity as early as 2020. By 2040 almost all of the segments would be failing.

Year	**AM**		**PM**	
	NB	**SB**	**NB**	**SB**
2020	2,449	1,068	1,720	2,021
2030	2,721	1,429	1,877	2,705
2040	3,079	2,277	2,822	3,082

It is important to note that a single express lane for this section would also have severe impacts that extend beyond capacity, such as operation (transit vehicles would tend to slow vehicles down), safety and incident management (with a single lane, the entire manage lane section would need to be shut down), and maintenance. In addition, providing one express lane will not be consistent with the purpose and need of the project. In conclusion, the PD&E Study Team is not supporting this recommendation and will not implement it.

6.16 Cost Risk Analysis

A Cost Risk Analysis (CRA) workshop was conducted as part of this PD&E from September 24 through September 27, 2012. The objectives of the cost risk analysis were to assess the overall project schedule, evaluate the cost and risks exposure, and investigate construction strategies and ways to handle adverse events capable of impacting the performance of the project. This CRA approach was to consider the three PD&E studies from Stirling Road (SR 848) to Linton Boulevard (CR 782) as one single corridor since the issues across the various projects tend to have some similarities. During the CRA workshop, 85 key risks to the project were identified and 66 were quantified. They cover the following disciplines: design, drainage, environmental, structures and geotechnical, right of way, utilities, construction, traffic management and maintenance, transit, management and funding, contracting and procurement, and public and local government.

The risks factors on cost and schedule identified for the Recommended Alternative throughout the entire corridor are shown in **Figure 6-14** and **Figure 6-15**.

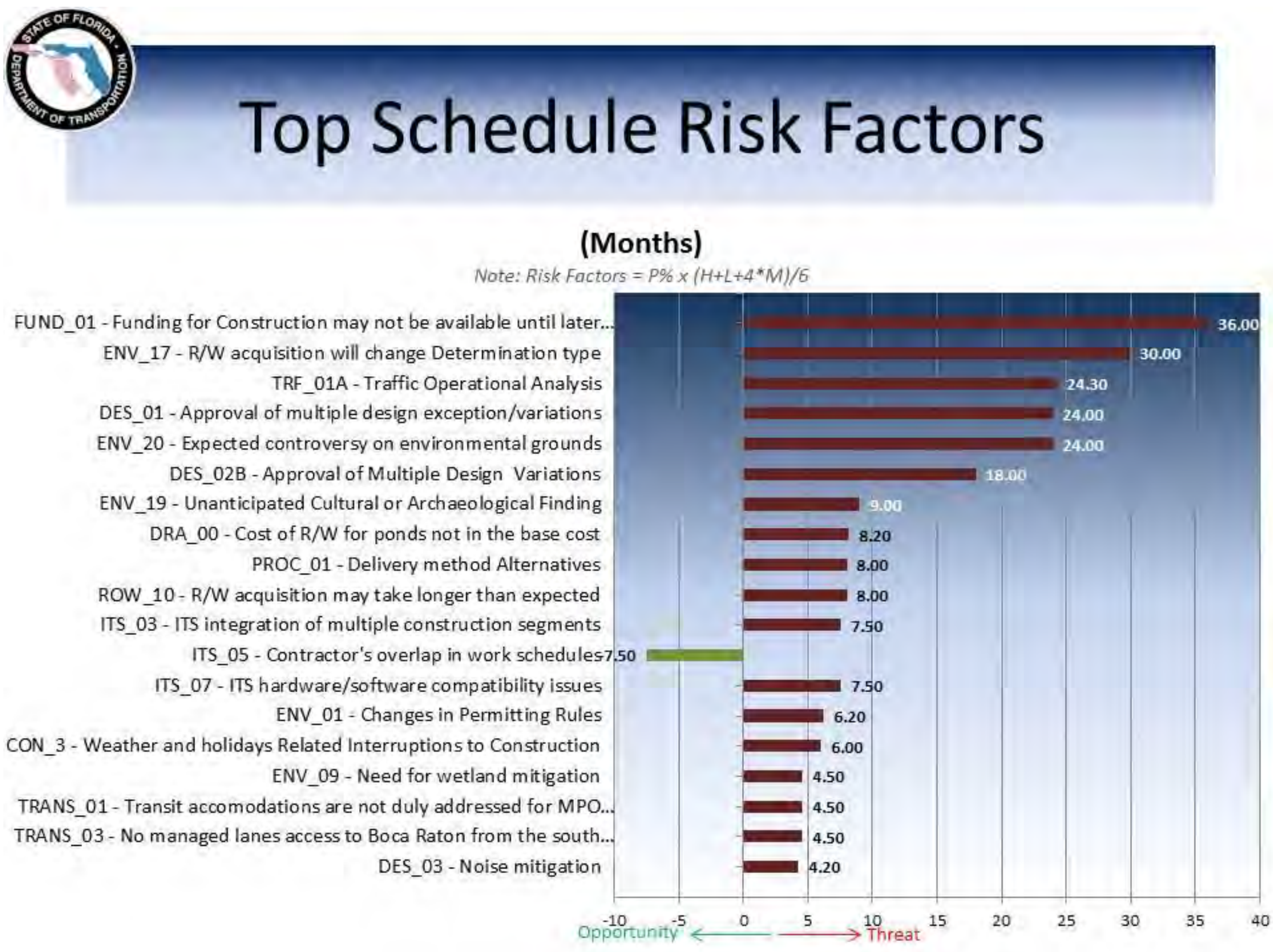


Figure 6-14
Top Schedule Risk Factors

Figure 6-15 provides a comparative cost summary between the Pre-mitigated I-95 Express Lanes Plan and the Mitigated Plan for the entire corridor. At the targeted 80% confidence level the non-mitigated plan was estimated at approximately $547 million, which would be reduced by 28% if the mitigations strategies are implemented.

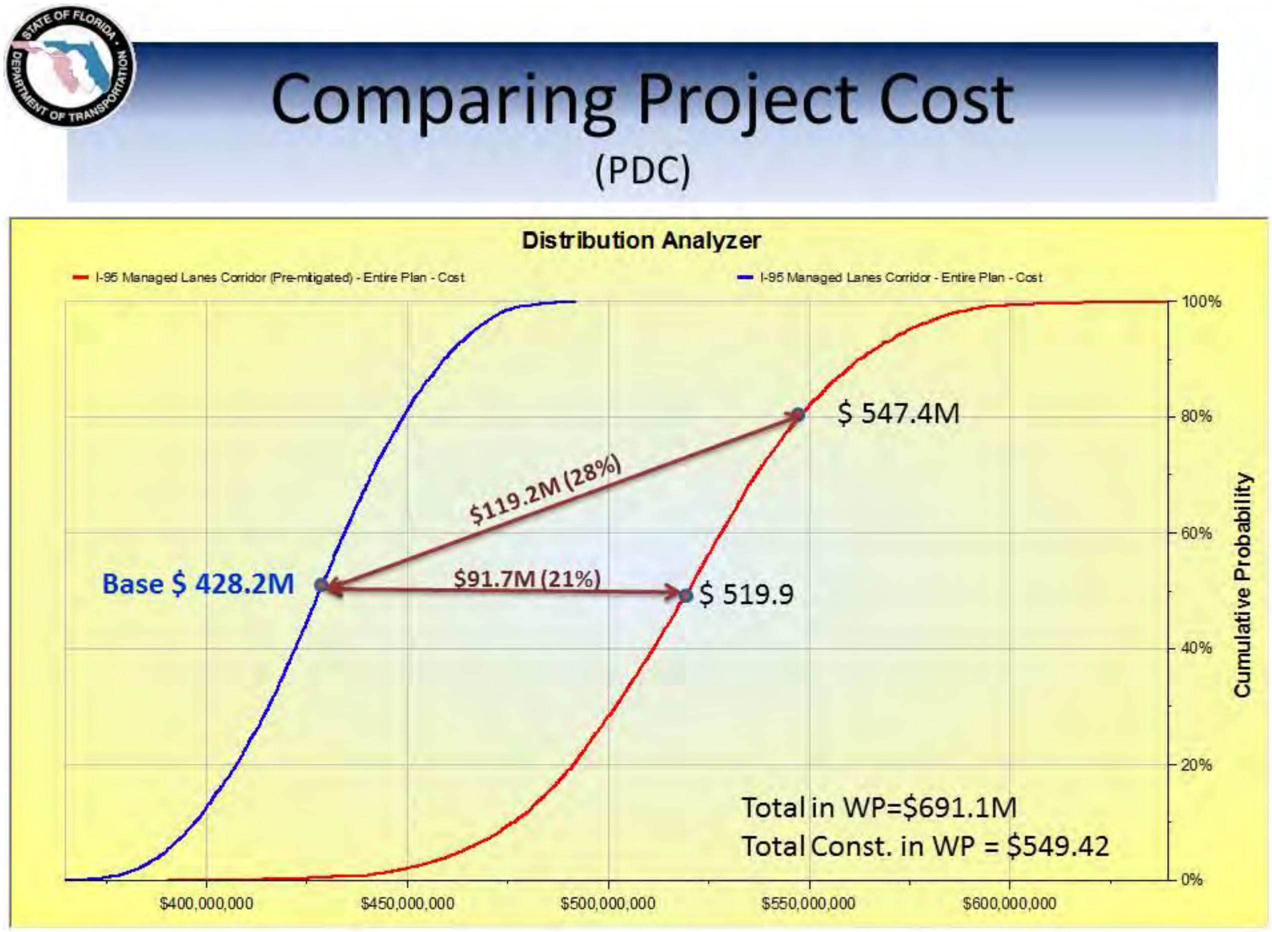


Figure 6-15
Comparative Project Cost

Some mitigations strategies are:

- Approval of exception for lane and shoulder widths to avoid impacting the interchanges. If a lane and shoulder exception is not granted, at least five interchanges would need to be reconfigured in this segment alone. All the overpasses bridges will need to be reconstructed.
- Avoid right of way acquisition for off-site drainage ponds. This strategy has been implemented.
- Establish reasonable construction segments to avoid repeat work and maximize the preservation of existing resources

- Conduct inspections to the cross–drains to verify conditions and understand their usability
- Avoid impacting the grounds of the North Woodlawn Cemetery located at the southeast quadrant of the Sunrise Boulevard (SR 838) interchange; Conduct public outreach and coordination with SHPO and FHWA
- Establish ITS infrastructure and potential location of gantries during PD&E to assess the availability of the right of way to accommodate the ITS hubs

6.17 Summary of Public Involvement

A comprehensive Public Involvement Program (PIP) was initiated as part of this PD&E Study. This program is in compliance with the Florida Department of Transportation (FDOT) PD&E Manual, Section 339.155, Florida Statutes; Council of Environmental Quality (CEQ) Regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA) and 23 Code of Federal Regulations (CFR) 771. The public involvement program included the publication of 2 newsletters, meetings with government agencies, 2 community outreach meetings, an Alternatives Public Workshop and a Public Hearing. A project website was developed for the project. The website, www.95stirlingoakland.com was another method used to allow the public to communicate with the project team, provide comments and disseminate updated information about the project.

The Alternatives Public Workshop was held on Wednesday, October 10, 2012 from 5:30 p.m. to 7:30 p.m. at the International Game Fish Association Fishing Hall of Fame and Museum, 300 Gulf Stream Way in Dania Beach, Florida 33004. An invitational letter and a copy of the meeting advertisement were mailed to property owners located within at least 300-ft on either side of the current project corridor, to public officials, organizations and individuals interested in the project.

As part of this PD&E, an assessment of cultural resources within the project Area of Potential Effect resulted in the identification of five historic resources (canals, bridges, and structures). Two of these are considered eligible for listing in the National Register of Historic Places: North Woodlawn Cemetery and Seaboard Airline/CSX Railroad. The proposed improvements were designed to avoid impacting these resources.

Coordination with CSX Railroad was initiated and will continue during the next phase. Two outreach meetings were held with the community at the vicinity of North Woodlawn cemetery to discuss the proposed improvements, gather their input, and address their concerns about the impacts of the project on the cemetery, particularly the potential potter's field thought to be underneath the existing northbound template of I-95. The design team reassured the community that the proposed design near the cemetery was developed to avoid impacts to this resource. In addition, the Department is committed to avoid any excavation within the limits of the cemetery to avoid disturbing any potential graves in the area. For more details, refer to the CRAS on file at the Department.

A Public Hearing was held on Thursday, April 11, 2013 at 5:30 p.m. at the Sheraton Fort Lauderdale Airport & Cruise Port Hotel, 1825 Griffin Road, Dania Beach, FL 33004. The purpose of the Hearing was to present the Recommended Alternative and give interested persons an opportunity to express their views concerning the location, conceptual design, socio-economic and environmental impacts of the proposed improvements.

The Public Hearing consisted of two parts, an initial informal session followed by a formal presentation. The informal session began at 6:30 pm during which time the hearing site was opened to the public to afford them the opportunity to review the conceptual design, display boards showing the typical sections, roadway improvements and other pertinent project information.

The formal presentation described alternatives evaluated and the details of the Recommended Alternative. It also discussed potential environmental, cultural and right of way impacts associated with the proposed improvements. For more info on the public involvement activities, refer to the Public Involvement Binder on file at the Department.

7.0 CONCEPTUAL DESIGN PLANS

The Conceptual Design Plans are shown in **Appendix G**.

8.0 LIST OF TECHNICAL REPORTS

Below is a list of technical reports and documents were completed for the Project and are on file at FDOT District 4.

Table 8-1 List of Technical Reports	
Type	**Technical Report**
Engineering	• Existing Traffic Conditions Report • Design Traffic Technical Memorandum • Future Traffic Conditions Traffic Operational Analysis • Traffic Analysis and Technical Memorandum • Safety Analysis Report • Location Hydraulics Memorandum • Stormwater Management Report • Bridge Analysis Report • Preliminary Geotechnical Report • Value Engineering Study Report • Cost Risk Assessment • Typical Section Package • Design Exception & Variation Packages
Environmental	• Cultural Resource Assessment Survey • Essential Fish Habitat Assessment • Wetlands Evaluation Report • Water Quality Impact Evaluation • Endangered Species Biological Assessment • Noise Study Report • Air Quality Technical Memorandum • Contamination Screening Evaluation Report • Categorical Exclusion Type 2 Document

APPENDIX A

Economic Loss Excerpts from Chapter 23 of the Florida Department of Transportation, Volume 1, 2012

Option 3: KABCO

Crash Severity	**Comprehensive Crash Cost**
Fatal (K)	$6,380,000
Severe Injury (A)	$521,768
Moderate Injury (B)	$104,052
Minor Injury (C)	$63,510
Property Damage Only (O)	$6,500

Source: Florida Department of Transportation Crash Analysis Reporting (C.A.R.) System

2. *Historical Crash Method (HCM)*

This method can be used for sites with a crash history. It is basically the ratio (benefit/cost) of the estimated reduction in crash costs to the estimated increase in construction and maintenance cost. The annualized conversion will show whether the estimated expenditure of funds for the benefit will exceed the direct cost, thereby lending support as to whether the improvement should be done or not.

The HCM uses the following ***Highway Safety Improvement Program Guideline (HSIPG)*** cost per crash by facility type to estimate benefit to society while the cost to society is estimated by the cost of right of way, construction, and maintenance.

HSIPG COST/CRASH BY FACILITY TYPE						
FACILITY TYPE	DIVIDED			UNDIVIDED		
	URBAN	SUBURBAN	RURAL	URBAN	SUBURBAN	RURAL
2-3 Lanes	$85,851	$151,015	$260,531	$92,847	$228,613	$402,003
4-5 Lanes	$83,359	$181,265	$366,422	$83,359	$193,774	$94,171
6+ Lanes	$107,658	$130,385	$478,263	n/a	n/a	n/a
Interstate	$141,197	n/a	$295,810	n/a	n/a	n/a
Turnpike	$124,459	n/a	$215,507	n/a	n/a	n/a

All State Roads Average Cost/Crash: **$142,472**

*The above values were derived from 2005, 2006, 2007, 2008, and 2009 traffic crash and injury severity data for crashes on state roads in Florida, using the formulation described in ***FHWA Technical Advisory "Motor Vehicle Accident Costs", T 7570.1, dated June 30, 1988*** and ***FHWA Technical Advisory, T 7570.2, dated October 31, 1994*** using updated fatality cost of $5.8 million as recommended in the U.S. Department of Transportation ***Office of Secretary Transportation memo, Treatment of the Economic Value of a Statistical Life in Department Analysis dated February 5, 2008 (http://ostpxweb.dot.gov/policy/reports/080205.htm).***

APPENDIX B

Federal Highway Administration Planning Memorandum

FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT IV

DESIGN ANALYSIS MEMORANDUM

For

SR 9/I-95 PD&E
From Stirling Road (SR 848) (MP 5.093)
To North of Oakland Park Boulevard (SR 816) (13.742)
ETDM # 13168

Broward County, Florida

FDOT Project Manager: Ray Holzweiss, P.E.

August, 2012

Prepared by:

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APPENDICES

1.0 INTRODUCTION

The Florida Department of Transportation (FDOT) District Four is conducting a Project Development and Environment (PD&E) Study for Interstate 95 (I-95/SR 9) from Stirling Road (SR 848) to North of Oakland Park Boulevard (SR 816) in Broward County. The total project length is approximately 8.649 miles.

Figure 1.1.1. depicts the project location and study limits. The primary objective of this project is to design a transportation system that will offer new commuting choices and more reliable travel during congested periods with the implementation of an express lanes system. The purpose of these express lanes is to improve mobility, relieve congestion, and provide additional travel options along the I-95 corridor. Express lanes will provide additional capacity and maximize vehicle throughput reducing delays for all travelers in the corridor, especially those traveling by carpool, vanpool or bus. This project will provide continuity with the proposed I-95 express lanes system immediately to the north of the study limits, as well as the existing I-95 express lanes system in Miami-Dade County, as envisioned in the I-95 Corridor Planning Study. The purpose of this memorandum is to document the potential impacts of the conceptual typical section concepts considered as part of this PD&E study. Four (4) conceptual typical sections were developed during the initial phase of the study.

Figure 1.1.1
Project Location Map

1.1 Background

I-95 is the primary north-south interstate facility that links all major cities along the Atlantic seaboard and is one of the most important transportation systems in southeast Florida. Within the study limits, I-95 is a major connector between south and north Broward and serves as a feeder route to east-west corridors along the facility. Master planning of major transportation facilities such as I-95 has been essential to ensure the availability of capacity within the transportation network and to support the region's high growth.

In September 2003, FDOT finalized a master planning study for the I-95/I-595 corridors and the South Florida Rail Corridor (SFRC), which evaluated the existing deficiencies and recommended possible future improvements along these corridors. In 2009, FDOT began an I-95 Corridor Planning Study between Stirling Road (SR 848) in Broward County and Indiantown Road (SR 706) in Palm Beach County to evaluate the feasibility of adding express lanes in the median of I-95.This study was completed in January 2012. The results of these master plan studies identified, recommended and prioritized the development of an integrated multimodal transportation system which is economically efficient, safe and environmentally sound.

1.2 Express Lanes Operations and Benefits

The goal of the I-95 express lanes project is to advance the regions' emerging express lanes network to provide congestion relief, a new mobility option and a funding source for transportation improvements including public transit. The express lanes will operate as High Occupancy Toll (HOT) lanes that drivers can choose to use. Tolls will vary with level of congestion with the goal of keeping traffic in the express lanes moving at a minimum speed of 45 MPH. The total number of general purpose lanes will remain the same. Some former general purpose lane users will shift voluntarily to the express lanes proving an overall degree of reduced congestion along the general purpose lanes. Travelers, who choose to pay the toll and use the express lanes system, will do so because the value of the trip they choose exceeds the value of the toll in effect for that trip.

Project Benefits

Increase efficiency of the existing facility – Express lanes will service more vehicles than the existing High Occupancy Vehicle (HOV) lanes. More efficient use of the existing facility is accomplished by encouraging transit and carpools to use the express lanes. Encouraging transit and carpools will reduce the number of cars in the road during peak travel periods.

Fast, reliable travel – Through the use of dynamic pricing, FDOT can manage the amount of traffic in the express lanes and maintain free-flowing speeds even when the general purpose lanes are congested. Motorists who choose to use the express lanes will benefit from reliable travel times. With more reliable travel speeds, transit agencies can enhance transit service along the corridor. Long trip motorists that commute daily between counties (Miami-Dade, Broward and Palm Beach) will benefit from using the express lanes by improving their travel time during peak travel periods.

Bus Rapid Transit (BRT) Implementation – BRT is a strategy to offer a more attractive alternative to automobile travel and to accommodate peak-period commuters switching to mass transit for a fixed rate per trip and to avoid the varying toll of congestion pricing. BRT also addresses the needs of low-income users and other disadvantaged groups.

Revenue reinvested in the corridor – Revenue from tolls would maintain the facility, enhance transit and provide enforcement.

1.3 FDOT Funding Philosophy

The following section is an excerpt from remarks prepared by Secretary Ananth Prasad. The full document can be found in **Appendix A**:

"The Florida Department of Transportation, under the leadership of Governor Scott and Secretary Ananth Prasad, together with our local, state, and federal partners, has created a Florida Transportation Vision for the 21st Century. It is imperative we take every possible step to spur job creation, and get our economy back on track. Adequately funding our critical projects is vital to our success. While FDOT's current budget is about $7.9 billion, we must identify creative financing alternatives to get more projects through the production pipeline.

To that end, Florida will be implementing a policy that all new capacity on interstates and expressways and widening and replacement of all major river crossings should be tolled where feasible or at the very least tolls should complement traditional funding in delivering the improvements and new capacity.

With more funding, we must develop an efficient transportation system that provides choices to the user and customer. Therefore, in order to provide a world class experience for commuters, the Department will be developing a system of managed lanes in Florida."

1.4 AASHTO Practitioner's Handbook

The American Association of State Highway and Transportation Officials (AASHTO) Practitioner's Handbook[1] provides guidance on states conducting National Environmental Policy Act (NEPA) studies for toll road projects. The Handbook states the following:

"The scope of the NEPA review required for a toll road project will depend to a great extent on policy decisions made outside the NEPA process. For example, these policy decisions may include a commitment to rely upon toll revenues as part of the state's or Metropolitan Planning Organization's (MPO) overall financial plan for funding needed transportation improvements. Similarly, a state or MPO could decide as part of its planning process to develop a network of express toll lanes or to designate certain regional corridors for the development of toll roads."

____

1. AASHTO Practitioner's Handbook Volume 03 (July 2006), "Managing the NEPA Process for Toll Lanes and Toll Roads", Page 3.

2.0 TYPICAL SECTIONS

2.1 Existing Typical Sections

The project corridor consists of three to four 12-ft wide general purpose lanes (GPL), one 12-ft wide High Occupancy Vehicle (HOV) lane, 12-ft outside shoulders, and inside shoulders varying from 10-ft to 12-ft. The existing typical sections can be divided into three different configurations based on the number of general purpose lanes, median width and features, and available auxiliary lanes. Existing typical sections are depicted in **Appendix B Exhibits 5** and **6**.

2.2 Concepts

Four potential typical section configurations, labeled Concept #1, Concept #2, Concept #3, and Concept #4, were evaluated as part of this memorandum. These concepts were analyzed using the following elements: Geometric evaluation of roadway template, qualitative drainage impacts, desktop environmental review of potential impacts, widening or replacement of bridges along the corridor, utility impacts, right of way acquisition and LRE based cost estimate. The potential impacts of these four concepts are summarized in the following sections.

Concept #1 – Barrier Wall Separated Express Lanes

Concept #1 features a standard typical section with 12-ft width for express and general purpose lanes (GPL, EL, and auxiliary lanes), 12-ft for left side and right side shoulders adjacent to GPL, and 6-ft and 10-ft for left side and right side shoulders adjacent to EL. This concept includes a concrete barrier separating the EL and GPL. Concept #1 typical sections are depicted in **Appendix B Exhibit 1**.

Concept #2 – Standard Tubular Marker Separated Express Lanes

Concept #2 provides a standard typical section that consists of 12-ft wide lanes (GPL, EL, and auxiliary lanes) and 12-ft shoulders with a 4-ft buffer between the EL and GP throughout the corridor, including at the constrained areas and through the interchanges. Concept #2 typical sections are depicted in **Appendix B Exhibit 2**.

Concept #3 – Standard with Reduced Typical Section

Concept #3 is being evaluated to determine where a standard typical section is feasible without impacting overpass bridges and interchanges. As a result, the typical section consists of 12-ft wide lanes (GPL, EL, and auxiliary lanes) and 12-ft shoulders with a 4-ft buffer between the EL and GPL within the unconstrained areas.

Within areas where the implementation of a standard typical section would require the reconstruction of an interchange or overpass or would have substantial impacts on the existing resources, such as the bridges and CD roads over the South Fork New River, the typical section will consist of a combination of 12-ft and 11-ft lanes and reduced shoulders with a 3-ft buffer between EL and GPL. The reduced typical section would be required at the SW 42 Avenue bridge and between SR 84 and Sunrise Boulevard. Concept #3 typical sections are depicted in **Appendix B Exhibit 3**. The limits of the standard, reduced, and constrained typical are highlighted in the schematic line diagram in **Appendix B Exhibit 5**.

Concept #4 – I-95 Express Lanes Phase II

Concept #4 provides a reduced typical section, which is a combination of 12-ft and 11-ft lanes and shoulders that vary from 12-ft where feasible to 3-ft at the constrained locations. It includes a 3-ft buffer between EL and GPL. It is consistent with the 95 Express Phase II typical section currently under construction to the south and provides route continuity with the previously constructed 95 Express Phase I typical section in Miami-Dade. Concept #4 typical sections are depicted in **Appendix B Exhibit 4**. The limits of the standard, reduced, and constrained typical are highlighted in the schematic line diagram in **Appendix B Exhibit 6**.

3.0 PRELIMINARY TYPICAL SECTION EVALUATION

3.1 Roadway/Mainline and Interchanges

Under Concept #1 the outside edges of pavement were designed to avoid impacts to three key constraints: CSX railroad lines on the west side, glide path directional lights of the Fort Lauderdale International Airport (southeast quadrant of I-595 interchange) and the Woodlawn Cemetery at the southeast quadrant of the Sunrise Boulevard interchange. Consequently, the centerline of I-95 was shifted eastward at various locations to avoid impacts to the railroad and was shifted westward at other locations to avoid impacts to other resources. Due to cross slope configuration and placement of new roadway features, it is highly unlikely that any existing pavement could be preserved. It will be utilized for maintenance of traffic during construction, but the entire facility will need to be reconstructed. All interchanges will also need to be reconstructed. For estimating purposes, it was assumed that the interchanges would be replaced in kind. However, other interchange configurations should be evaluated for each location if this concept were to be carried forward in the PD&E study.

Under Concept #2 the edges of pavement were established considering widening on both sides of the facility. Widening varies between 14-ft and 18-ft per side. Accommodating the standard typical section would entail the reconstruction of several interchanges and overpass bridges. It would also entail the reconstruction and widening of the bridges over the South Fork New River. This configuration would also entail the reconstruction of several interchanges, though their functionality is expected to be maintained with one exception: the Sunrise Boulevard interchange. The NB to EB exit ramp will have to be reconfigured to avoid impacts to the Historic Woodlawn Cemetery, located on the SE corner of the interchange.

For Concept #3 the edges of pavement were established considering widening on both sides of the facility. Widening varies between 15-ft and 9-ft per side. Accommodating the standard typical section is feasible from Stirling Road to SR 84 with a constrained point at SW 42nd Street and from Sunrise Boulevard to north of Oakland Park Boulevard. The middle segment is constrained by the bridges at the SR 84, Davie Boulevard and Sunrise Boulevard interchanges as well as the South Fork New River bridges, the CD road and CSX railroad tracks to the west and by the CD road to the east. As a result, the alignment and EOP for Concept #3 were designed to avoid impacting these resources and the aforementioned interchanges. Only minor adjustments to the interchanges are anticipated.

Concept #4 would feature widening between 11-ft and 15-ft per side. This concept would not require any reconstruction of bridges on I-95 or crossing I-95. The typical section for Concept #4 would be constrained and consequently further reduced at SW 42 Avenue, from SR 84 to Davie Boulevard, and again at Sunrise Boulevard. Only minor adjustments to the interchanges are anticipated.

Design Variations and Exceptions

Concept #1 will require reconstruction of the corridor and consequently will feature only one design variation: border width.

Concept #2 will require only widening, so all existing design variations resulting from geometric deficiencies will remain. These variations include: vertical alignment, horizontal alignment, stopping sight distance, vertical clearance, and border width.

Concepts #3 and #4 will also require only widening. Additionally, the typical section for both concepts is reduced at various locations along the corridor. Consequently, the design variations and exceptions are the same for both alternatives. The variations include: vertical alignment, horizontal alignment, stopping sight distance, vertical clearance, and border width. The exceptions are lane width and shoulder width.

Concepts #2, #3, and #4 all require only widening of the I-95 mainline, therefore all three concepts will maintain the existing design variations. Concept #2, however, will not have any of design exceptions that will be required in Concepts #3 and #4, since this alternative will feature a standard typical section throughout the entire corridor.

Detailed tables describing the locations where these design variations and exceptions occur are included in **Appendix C**.

3.2 Structures

There are 58 bridge structures along the corridor. Under Concept #1, two alternatives were considered: widening and replacement. By using a shallower superstructure, most of the overpasses along I-95 can be widened. The only exceptions are the bridges over Dania Cut-Off canal which have to be replaced due to a shift in the horizontal alignment of I-95 at this location and the bridges over the C-13 canal that already use the shallowest possible concrete I girders, AASHTO Type II beams. A total of 12 bridges will have to be widened.

In addition to the I-95 bridges where widening is not feasible, most bridges crossing over I-95 will have to be replaced, including seven I-595 bridges. Cost estimates for the proposed structures were developed assuming the same type of bridge as existing (superstructure and substructure). A total of 39 bridges will have to be replaced.

Under Concept #2, all I-95 bridges would be widened to accommodate the proposed typical section. The existing bridges over I-95 under which the standard typical section could not be accommodated would be replaced. Cost estimates for the proposed structures were developed assuming the same type of bridge as existing (superstructure and substructure). A total of 17 bridges will be widened and 20 will be replaced.

Under Concepts #3 and #4, all I-95 bridges would be widened to accommodate the proposed typical section. The existing bridges over I-95 under which the proposed typical section could not be accommodated would be maintained, as these two concepts further reduce the shoulders and the buffer between the EL and the GPL in order to not impact the overpasses. Concepts #3 and #4 would require widening 17 bridges and no bridge replacement.

3.3 Drainage

A qualitative review was conducted to estimate whether offsite Right-of–Way (R/W) will be needed to a meet stormwater treatment requirements for the study corridor. The project corridor was divided into ten basins following existing drainage divides. Limits of the basins and an estimate of additional R/W required are shown in **Table 3.3.1** below. The following assumptions were made during this evaluation.

- Treatment criteria are current SFWMD rules.
- Stormwater treatment will only be provided for the increase in impervious area.
- Nutrient loading analysis will be based on the modified Harper methodology where the predevelopment condition is existing condition.

- Primary treatment facilities within the existing R/W will consist of roadside linear ponds with exfiltration trenches to facilitate pond recovery.
- Hydraulic conductivity of in-situ soil will have a minimum value of 8×10^{-5} cfs/ft^2-Head.
- Unsuitable soils, such as muck, will be removed as needed to allow the proposed exfiltration trenches to function properly.
- Offsite ponds will be designed to function as wet-detention.
- Base clearance will not be impacted by roadside linear ponds.
- Attenuation requirements will be post <=pre.
- Water quality requirements will govern size of stormwater management system.
- Offsite R/W quantity is estimated as 5 acres per basin for the purpose of obtaining a value for the LRE.
- The Department will acquire the complete parcel in locations where R/W is needed for the roadway and partial acquisition would substantially impact the land-use of the parcel. The portion of the parcel not being used by the roadway would then be available for the stormwater management system. Basins where this assumption has been made are indicated with an asterisk "*". A note is made that the R/W acquisition estimate for the roadway is based on the footprint of the roadway and area needed for conveyance, and may not take into account parcels where complete acquisition would be prudent. As such, basins marked with an asterisk will be considered as requiring acquisition of 5 acres for the purpose of obtaining a value for the LRE.

Table 3.3.1
Stormwater R/W Estimate

Drainage Basin	System Limits	Additional Offsite R/W			
		Concept #1	Concept #2	Concept #3	Concept #4
1	Stirling Road to Dania Cut-off Canal	No	No	No	No
2	Dania Cut-off Canal to I-595	No	No	No	No
3	I-595 West	No	No	No	No
4	I-595 to South Fork New River	***No**	No	No	No
5	I-595 East	No	No	No	No
6	South Fork New River to Park & Ride	**Yes**	**Yes**	**Yes**	**Yes**
7	Park & Ride to North Fork New River	***No**	**Yes**	**Yes**	**Yes**
8	North Fork New River to Sunrise BLVD.	***No**	**Yes**	**Yes**	**Yes**
9	Sunrise BLVD. to NW 19th Street	No	No	No	No
10	NW 19th Street to Oakland Park BLVD.	**Yes**	**Yes**	**Yes**	**Yes**
R/W Estimate for LRE		25 Ac. (5 Basins)	20 Ac. (4 Basins)	20 Ac. (4 Basins)	20 Ac. (4 Basins)

3.4 Environmental Impacts

Environmental Justice

Under Concept #1, the extended typical section requires right-of-way acquisition. The Dorsey Riverbend Neighborhood, a Front Porch Community dominated by low-income minorities, is located along both sides of I-95 between West Broward Blvd. and Sunrise Blvd. Minor right-of-way acquisition is required from approximately just north of Broward Blvd to north of NW 3rd CT, a portion of which is residential. Substantial right-of-way acquisition (1st row homes) is required for approximately 4000-ft south of Broward Blvd. This is also a low-income minority community with more than 20% of the households below poverty with a median income between $10,000 and $30,000. Public outreach will be required.

Concepts #2, #3, and #4 do not require right of way acquisition for the mainline improvements. No social, business, or neighborhood impacts due to construction are anticipated.

This project will allow FDOT to facilitate the potential provision/expansion of transit service (particularly Bus Rapid Transit). This provides the transit dependent population with greater mobility choices to reach employment centers and other destinations.

Wetlands

The anticipated impacts from the Concept #1 typical section include wetlands and wet swales within the in-fields of the interchanges proposed for reconstruction, as well as the additional wetland impacts at waterbody crossings. Concept #1 requires the construction of a new mainline and CD Road bridge over the South Fork of the New River.

Widening for Concepts #2, #3, and #4 will result in minimal wetland impacts, which are primarily limited to fringe wetlands at waterbody crossings. Concept #2, however, will require reconstruction and widening over the South Fork New River.

Section 4(F) and Section 106

Concept #1 requires construction to the current right-of-way line of the historic Woodlawn Cemetery property. Right-of-way acquisition is required from a property adjacent to the east side of I-95, north of Stirling Road which contains an archaeological site (BD02904). Extent of right-of-way impact could require further analysis. The construction would also extend towards a second archaeological site (BD00207) east of I-95, just north of the South Fork of the New River. Concept #1 requires the reconstruction of the ramps connecting to Griffin Road (BD04432), which is a State Historic Preservation Office (SHPO) resource group. Concept #1 has the greatest potential for adverse cultural impacts requiring completion of the full Section 106 process and additional DOEs.

Concepts #2, #3, and #4 require widening towards the Historic Woodlawn Cemetery property, but will not encroach on the right-of-way line.

Noise Impacts

The extended widening required for Concept #1 will bring travel lanes/noise source closer to existing noise receptors. However, the proposed traffic barriers adjacent to the express lanes will cancel some of the tire noise from the express lanes, resulting in similar noise impacts to the other concepts. Existing noise barriers would require relocation and additional noise barriers may be required.

The widening required under Concepts #2, #3, and #4 will also bring travel lanes/noise source closer to existing noise receptors. Under these three concepts, existing noise barriers would be maintained, although additional noise barriers may be required.

3.5 Right of Way

The roadway improvements for Concept #1 will require right of way acquisition along the corridor. This acquisition will take place predominantly on the east side and the width will vary throughout. The preliminary total acquisition due to roadway improvements is approximately 36.2 acres. This right of way acquisition will impact approximately 39 single family homes, 2 apartment buildings and 7 commercial properties along the corridor. No right of way acquisition is anticipated to accommodate the widening under Concepts #2, #3, and #4. All four concepts could potentially require additional right of way for off-site ponds.

3.6 Utility

Utility impacts are expected to be more severe under Concept #1 than under Concepts #2, #3, and #4. The ITS Fiber Optics cables run on the west side along I-95. Their exact location is not known at this time. However, provision for their potential relocation under Concept #1 is accounted for in the cost estimate. In addition, several other utility facilities that are located within the interchanges will also need to be relocated. These utilities are listed below and their relocation is accounted for in the LRE.

Table 3.6.1 Utility Summary						
Location along I-95	Utilities					
	Electric	WM	FM	Gas	BFO	Telephone
Stirling Road	23KV, 138 KV	12-in	8-in	6-in	-	4-4-in
Griffin Road	23KV	16-in	8-in	6-in	-	8-4-in
SW 42nd Street	23KV	12-in, 10-in	8-in	4-in	-	-
I-595		24-in	12-in	16-in	-	-
SR 84	23KV, 138 KV	12-in	8-in	-	BFO	-
Davie Blvd	23KV	24-in	24-in	-	BFO	-
Broward Blvd	23KV	30-in	18-in	-	BFO	-
NW 6th Street	23KV, 138 KV	10-in	6-in	-	BFO	-
Sunrise Blvd	23KV, 138 KV	12-in	8-in	6-in	BFO	-
NW 19th Street	23KV	24-in	12-in	-	BFO	-
Oakland Park Boulevard	23KV, 138 KV	18-in	12-in	8-in	-	6-4-in

The relocation quantity for each utility at each location listed above is 300 LF, except for Telephone and Buried Fiber Optic (BFO), for which 400 LF were assumed for each utility at each location.

3.7 Maintenance of Traffic

Concept #1 will require the most complex maintenance of traffic. This concept requires major roadway, interchange, and bridge reconstruction. There is no expected preservation of existing roadway, however the existing roadway can be utilized to facilitate the maintenance of traffic operations. Concept #2 requires widening of the mainline only, and therefore maintenance of traffic for the mainline will differ only slightly from Concepts #3 and #4. However, three interchanges and several bridges will require reconstruction. This reconstruction will make the maintenance of traffic for Concept #2 more complex than Concepts #3, and #4. Concepts #3 and #4 will require widening of the mainline and bridges and only minor modifications at the interchanges. The maintenance of traffic for these two concepts should only feature minimal challenges and impacts.

3.8 Conceptual Construction Cost

The preliminary cost estimates for all concepts are included in the table below:

Table 3.8.1
Long Range Estimate Summary

Concept	Roadway	Structure	Sub-Total	20% Contingency	Total
1	$200,422,249	$421,023,810	$621,446,059	$124,289,212	**$746,000,000**
2	$131,932,813	$111,004,505	$242,937,318	-	**$243,000,000**
3	$57,198,931	$6,900,651	$64,099,582	$12,819,916	**$77,000,000**
4	$55,357,534	$6,259,923	$61,617,457	$12,323,491	**$74,000,000**

The cost for Concept #2 does not include a 20% contingency since a Cost Risk Analysis was conducted for this concept.

APPENDIX A

Remarks on Florida Department of Transportation Vision for the 21st Century

Secretary Ananth Prasad
Florida Department of Transportation
Remarks on Florida Transportation Vision for the 21st Century
August 5, 2011
As Prepared

Governor Scott – Florida Transportation Vision for the 21st Century

In order to grow, prosper, and create the conditions for the private sector to produce better jobs, Florida must have the best transportation and infrastructure system in the nation.

The Florida Department of Transportation, under the leadership of Governor Scott and me, together with our local, state, and federal partners, has created a Florida Transportation Vision for the 21st Century.

It is imperative we take every possible step to spur job creation, and get our economy back on track.

Now more than ever, our nation needs entrepreneurs, businesses, and the private sector to have the confidence to create and start their own businesses, and grow our economy.

As you all know, transportation investment is a first step toward doing exactly that.

Financing and Creative Alternatives

Adequately funding our critical projects is vital to our success.

While FDOT's current budget is about $7.9 billion, we must identify creative financing alternatives to get more projects through the production pipeline.

I. Gas Tax. The gas tax as a funding source for transportation is not sustainable. Therefore we must diversify our sources of revenues in order to invest in the state-of-the-art infrastructure for Florida to compete nationally and globally.

II. Tolling. To that end, Florida will be implementing a policy that all new capacity on interstates and expressways and widening and replacement of all major river crossings should be tolled where feasible or at the very least tolls should complement traditional funding in delivering the improvements and new capacity.

Creating Choices

With more funding, we must develop an efficient transportation system that provides choices to the user and customer.

Therefore, in order to provide a world class experience for commuters, the Department will be developing a system of managed lanes in Florida.

Building upon the success of the I-95 managed lanes in Miami-Dade County and the planned expansion into Broward County along with the on-going construction of I-595 managed lanes, the Department will be going forward with a Public Private Partnership in expanding the system along I-75 in Broward County in spring of 2012.

Other planned systems include Palmetto Expressway in Miami-Dade County.

What you'll see is a loop of managed lanes around southeast Florida to better serve our customers.

We will also be conducting an investment grade traffic and revenue study in 2012 of I-4 managed lanes. (Orlando by 2013)

We'll be holding an Industry Forum next year to talk to PPP firms about what it would take to deliver these projects.

The goal is to move people and goods more effectively and efficiently through managed lanes and other alternatives throughout the State.

Tri-Rail

Another PPP opportunity is with Tri-Rail.

Florida has historically lagged other similarly situated states when it comes to transit opportunities and alternatives.

And while Mass Transit Systems inherently have challenges, there appear to be great opportunities on the horizon.

Florida will again set the stage to provide transit choices using a Public Private Partnership.

The Department will embark on a PPP along the Tri-Rail corridor where we can expand service, lower the cost to the taxpayer, all while providing quality services to the customer.

Freight/Ports

As you all know, the Governor has placed special emphasis on port development to create jobs and get the economy moving.

The Panama Canal expansion provides Florida and Florida ports with a once in a lifetime opportunity to be a game changer when it comes to trade regionally, nationally, and globally.

Funding of the Port of Miami dredging is the first step in changing this dynamic and it is getting noticed.

But for the State of Florida to begin to plan strategically and become the shining example for business development and for greater efficiencies in the movement of cargo and freight to the end-user, the Department has created an Office of Freight Planning and Logistics.

This office will include the Seaports Office, the Rail Office and will also focus on cargo movement by air and truck.

The creation of this office will play a key role in advancing Governor Scott's initiatives to transform Florida's economy by becoming a global hub for trade, logistics, and export-oriented manufacturing activities.

Space and Aviation

In addition to looking out at our vast oceans for increased commerce, we must also look up.

The end of the NASA Space Shuttle program will accelerate growth in the commercial space industry.

Florida, with its strong history in the aerospace industry, a highly-trained workforce, proven infrastructure, has a unique opportunity to lay the groundwork for a thriving commercial space industry in Florida.

This year, the Department will invest over $15 million for infrastructure improvements at Cape Canaveral and will work in partnership with Space Florida, NASA and the private sector to create jobs and strengthen Florida's position as the global leader in aerospace research, investment, exploration, and commerce.

In addition, Florida's aviation transportation system includes four large-hub commercial service airports which process 7% of the nation's cargo and 10% of the nation's passengers.

Over 50% of Florida visitors arrive via our airports and the Department will invest over $170 million this year to support strategic investments in Florida's aviation infrastructure.

Regional Governance

As we advance more projects, we must reduce bureaucracy and streamline our decision making.

The 2060 Florida Transportation Plan (FTP) highlighted the large number of agencies with transportation responsibilities: 411 municipalities, 67 counties, 26 metropolitan planning organizations (MPOs), 28 fixed route transit systems, 11 regional planning councils, 11 transportation authorities, 7 FDOT districts, and 2 enterprises, among others.

Because of the great many political and governmental entities weighing in on transportation planning and decision-making, many of these decisions are made at the local level.

While there is great need for local input, our economy and business investments are made regionally.

Therefore, instead of just thinking locally, we must think more regionally.

We are seeking to transition Florida's planning process to focus on regional and metropolitan transportation issues.

For example, through stronger MPO partnerships or potential consolidation of MPOs within urbanized areas, we will be better able to

- promote integrated regional transit solutions, including potential consolidation of existing transit agencies or creation of regional transit agencies
- strengthen regional transportation planning and priority setting in rural areas
- strengthen regional coordination among seaports, airports, spaceports, railroads, other modal partners, as well as among operating agencies
- and, provide incentives/remove disincentives to regional planning and decision making.

Future Corridors

Now, let me spend a few minutes talking to you about Future Corridors.

In order for the state to maintain our competitive edge, we must not only maintain our existing system at the highest levels, we must also plan for a transportation system not just for the next decade but for decades to come.

This means we must plan and develop our Future Corridors.

The 2060 Florida Transportation Plan (FTP) recommends creating an integrated statewide vision to coordinate existing plans and provide a unified view of Florida's future.

One important outcome of a statewide vision would be a context for planning the future of our major transportation corridors – for example, what parts of the State do we need to better connect to support economic opportunities?

FDOT in cooperation with partners throughout the state developed the Future Corridors Action Plan in 2006, which provided the overall policy direction for a statewide network of high-speed, high-capacity corridors critical to the state's continued growth and development.

The plan identified 14 initial study areas where FDOT should work with partners and stakeholders to explore potential new or transformed corridors.

Five of these corridors exist today (Interstate Highways & US 27) and would be transformed to serve new functions (e.g., tolled express lanes, truck-only lanes, or bus rapid transit systems).

The remaining corridor study areas represent regional pairs not well connected by a high-speed, high-capacity corridor today, or where existing corridors do not have the capacity to support anticipated growth in demand over the next 50 years.

Examples of study areas recommended for advancement included:

- Hillsborough County to Duval County: Interregional connectivity, congestion relief, and freight mobility
- Manatee County to St. Lucie County (East-West Heartland Parkway): Interregional connectivity, congestion/delay, and freight mobility
- Collier County to Polk County (North-South Heartland Parkway): Access to/from economically distressed or developing areas, emergency evacuation/response, and support regional vision
- Bay County to Alabama: Interstate connection, create economic opportunities in a designated Rural Area of Critical Economic Concern.

The Department, in conjunction with the Department of Economic Opportunity, the Department of Environmental Protection and the Florida Fish and Wildlife Conservation Commission, will advance the study of these corridors so that they are preserved for future growth of the state.

<u>Faster Project Delivery</u>

What's really important to the people in this room and the folks in your industry is to get projects done quicker.

Florida has long set the nation's standard for efficient and timely project delivery.

But we can do better.

Under Governor Scott's and my leadership, the Department will work to streamline all stages of project delivery in order to reduce the time it takes for a project to go from idea to customer ready.

This means building on Governor Scott's initiative to further reduce unnecessary bureaucratic red tape.

It means working with other local, state, and federal agencies to remove regulatory burdens that discourage a project from moving forward or scare away new private sector investment.

It means creating the conditions for more privatization of things that the private sector does better than the government.

Here's the bottom line – we will be doing even more outsourcing - if it's in the yellow pages, we shouldn't be doing it!

<u>Ready to Work!</u>

Governor Scott has pledged to work to create the economic conditions for the private sector to create 700,000 jobs in 7 years.

Governor Scott is the "transportation governor" and to that end he has committed to making the needed investments in transportation infrastructure which is a tried and true model to create both direct and indirect private sector jobs and investment.

At a time when too many people are looking for work and input prices such as commodity costs and labor are low, we must make these investments now.

Additionally, while there is significant capacity in the private sector to deliver more while doing so at historically low prices, the Department will be using innovative financing tools to advance nearly a billion dollars of construction projects into the current fiscal year.

Projects that will be advanced include

- US 27 in Polk County
- I-75 in Lee County
- SR 9B in Duval County
- Quincy By-Pass in Gadsden County
- SR 79 Public-Private Partnership in Holmes and Washington counties
- I-95 in Indian River County
- I-95 in Brevard County
- SR 823/NW 57 Avenue in Miami-Dade County
- SR 50 in Hernando County
- and Pinellas Byway and Veterans Expressway in Hillsborough County.

90/10 Rule – My Vision for the Agency

Turning internally now – but something that will have a major impact on our output and your industry – is my vision for the agency.

90% of what we do day-in-day out will get done regardless of the leadership.

Our revenues are going to be what they are based on fuel consumption and the FDOT machine will plan, design, build, operate and maintain without major hiccups.

I've asked the District Secretaries to focus on leading and on the 10% that will move the needle.

I want the Districts to be more alike than not alike.

I have issued a challenge to each District Secretary on advancing projects that we would otherwise dream and focus their energy and creative thinking on delivering those projects.

I believe in a decentralized agency but I want to revitalize the Department through CPR – I am a stickler for being

- Consistent
- Predictable
- Repeatable

I have no intent of recentralizing what we do but I can tell you that there’s going to be great and persistent emphasis on folks in the district to be very consistent.

They will be held accountable for that.

I will discuss just about every major policy with the districts and every district leadership team will be involved in a very thoughtful and open dialogue.

But when a decision is made there’s no watering down that decision – we’ll expect the districts will always deliver that.

The military uses the term “centralized command and decentralized execution” – that’s the model here.

I don’t want to make every decision but we’re going to create a framework of how decisions should be made, and districts are going to have to follow that.

FDOT is a very process driven organization.

Therefore, it is imperative that the Core Offices focus on their core functions and focus on their core competencies.

Over the next few months, we will be looking at the Engineering and Planning side of things and realign.

So here is some football jargon to sum it up!

One of my previous bosses used to tell the leadership that we have to get back to sound blocking and tackling.

I’ve seen some schemes of blocking and tackling at the Department that I wasn’t so sure they were built for success.

So I’m going to change those schemes to make sure that we are fundamentally sound in blocking and tackling and that we minimize false starts and fumbled exchanges.

<u>Federal Reauthorization</u>

Turning to Washington now, I appreciate House Committee on Transportation and Infrastructure Chairman John Mica’s vision and work to reauthorize nation’s surface transportation programs for the next six years.

Florida, along with 6 other states was at the table with Cong. Mica in shaping this proposed bill.

In July, Chairman Mica and members of the committee unveiled a comprehensive, multi-year transportation plan that will reform the nation's federal highway, transit, and highway safety programs:

- pro-growth
- pro-jobs transportation plan
- consolidates and reduces federal programs while retaining eligibility
- cuts red tape that needlessly increases project costs
- fiscally responsible ... live within our means.

We need a six-year bill to preserve the concept of having a highway trust fund that doesn't spend more than it takes in and is fiscally sound.

The Senate's two-year proposal is not fiscally responsible and it doesn't provide long-term certainty.

A couple of highlights of the plans that I am very excited about are:

- New capacity on interstate can be tolled.
- Environmental streamlining …cuts time in half …concurrent approvals …establish project thresholds that qualify for Categorical Exclusions and established hard deadlines on resource agencies to respond.
- Establishes thresholds of federal funding to trigger environmental review under NEPA.
- Completion of environmental review within 270 days.

These proposals enable states like Florida to continue to deliver the high-quality projects we all expect and will allow the private sector to invest in our state and create jobs.

I look forward to working with Chairman Mica and the members of the Committee as they move this innovative plan through Congress.

Florida's Turnpike

Earlier this week, I announced Diane Gutierrez-Scaccetti as the new Executive Director of Florida's Turnpike Enterprise.

Diane, who brings more than 20 years of toll road experience to the Florida Turnpike Enterprise, previously served as Executive Director of the New Jersey Turnpike Authority.

She is a proven leader with the financial and management experience to bring bold, innovative, and new ideas to Florida's Turnpike.

The Florida Turnpike Enterprise is nationally recognized as one of the best turnpike authorities in the country.

It is one of the financially strongest systems in the country and historically has a high bond rating coupled with consistently high customer satisfaction.

As such, Florida's Turnpike Enterprise will become a catalyst for new development throughout the State.

By leveraging Florida's Turnpike System, we will be advancing major transportation improvements to set Florida apart from any other state in this country.

These transportation improvements valued at $1.8 billion include

- sections of the Wekiva Parkway in Orange County
- the First Coast Outer Beltway in Jacksonville and Northeast Florida
- the widening of the Homestead Extension of Florida's Turnpike in Miami-Dade County
- the widening of the mainline Turnpike in Osceola and Orange counties
- and the Veterans Expressway in Hillsborough County.

Speaking of the Wekiva Parkway, I hope to be moving dirt on that project by October/November 2012.

Additionally, the Turnpike is going to aggressively pursue the conversion to All Electronic Tolling on the mainline of the Turnpike.

The adoption of this technology will save millions of dollars and will improve the commuter experience by keeping traffic constantly moving.

These are exciting times.

We will be conducting a Turnpike Industry Forum in late September/early October with a menu of things that we currently do and explore Public Private Partnership opportunities with the goal to leverage the system to generate more revenue thereby putting more work on the highways and creating jobs!

Some of the items on the menu are naming rights for the Turnpike plazas and naming rights for the Turnpike itself.

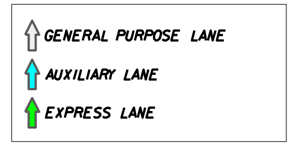
Partnerships/Conclusion

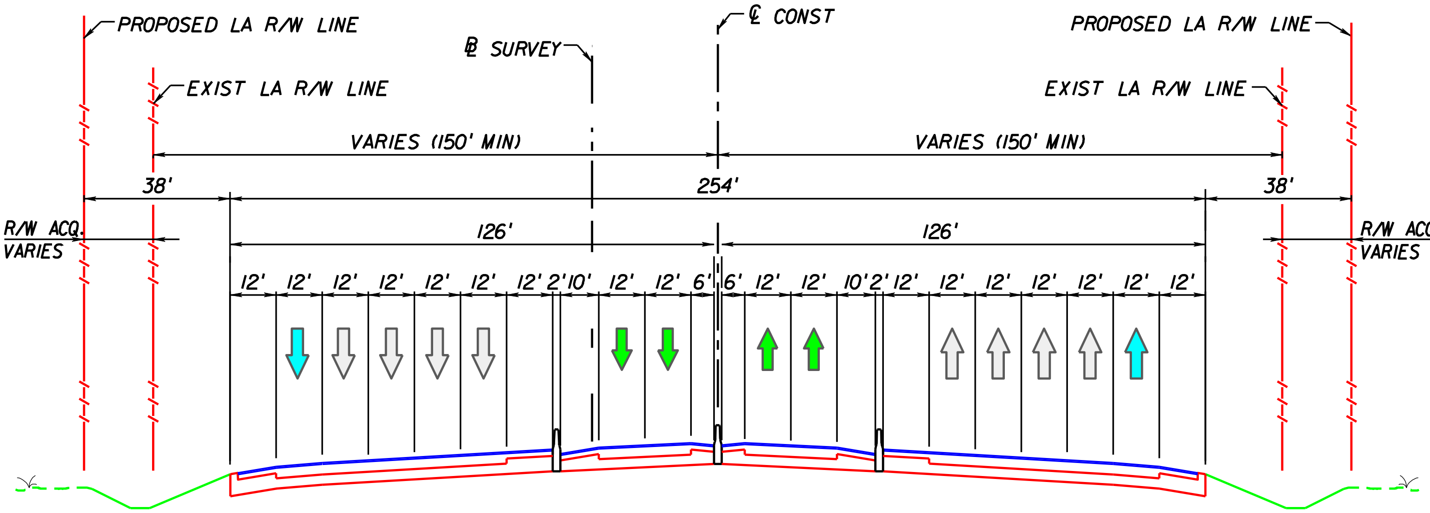
Thank you for all you do as our transportation partners

Transportation connects not only places where we live, work, and play but also people and businesses to opportunities!

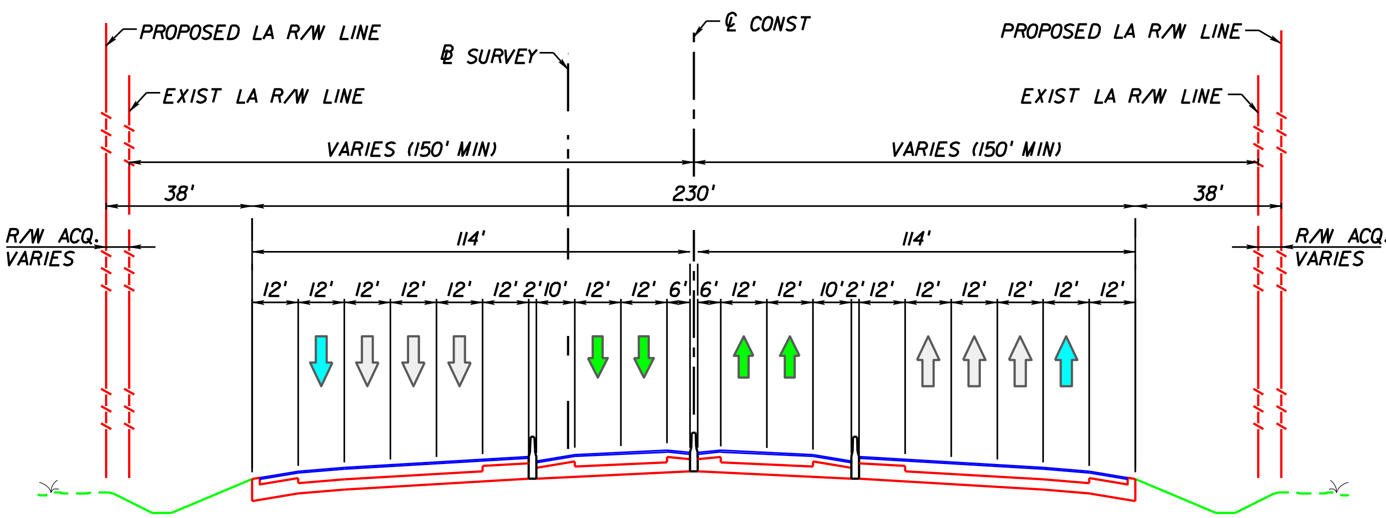
APPENDIX B

Exhibits 1 through 7



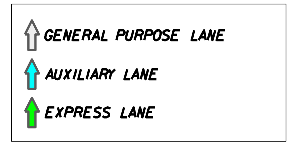


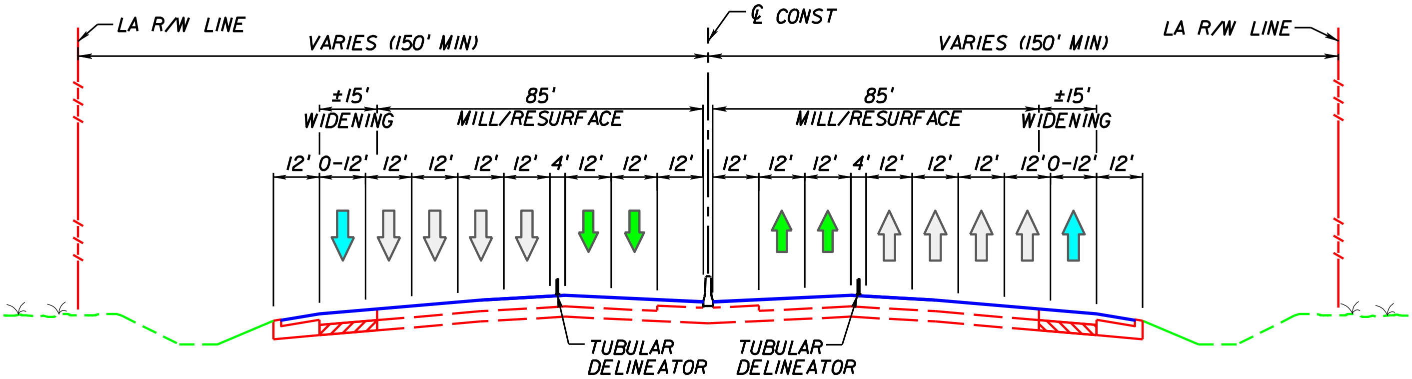
STANDARD 4 LANE
TYPICAL SECTION
FROM STIRLING RD TO SR 84
AND FROM BROWARD BLVD TO OAKLAND PARK BLVD



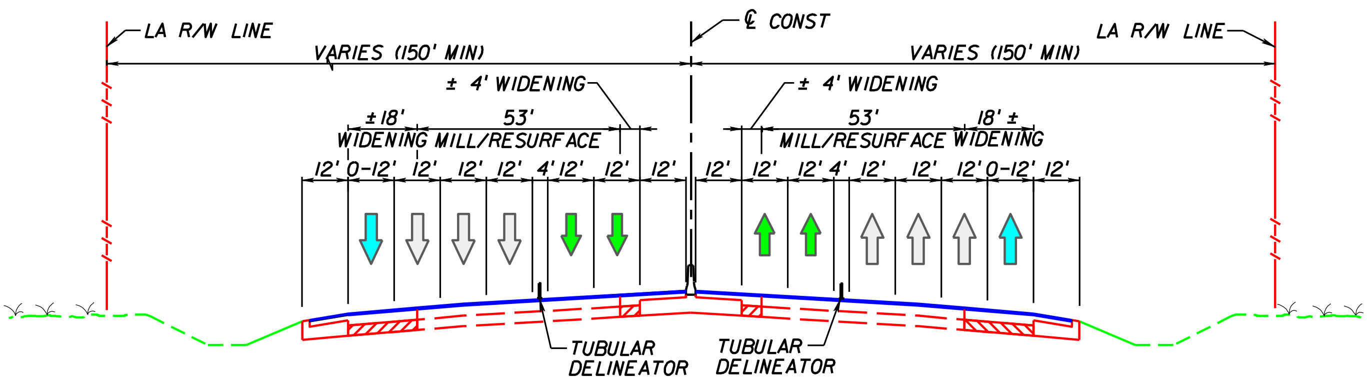
STANDARD 3 LANE
TYPICAL SECTION
FROM SR 84 TO BROWARD BLVD

I-95 (SR 9) PD&E STUDY FPID: 429804-1-22-01 July 2012	CONCEPT # 1	SHEET NO.
	CONCEPTUAL TYPICAL SECTION EVALUATION	1

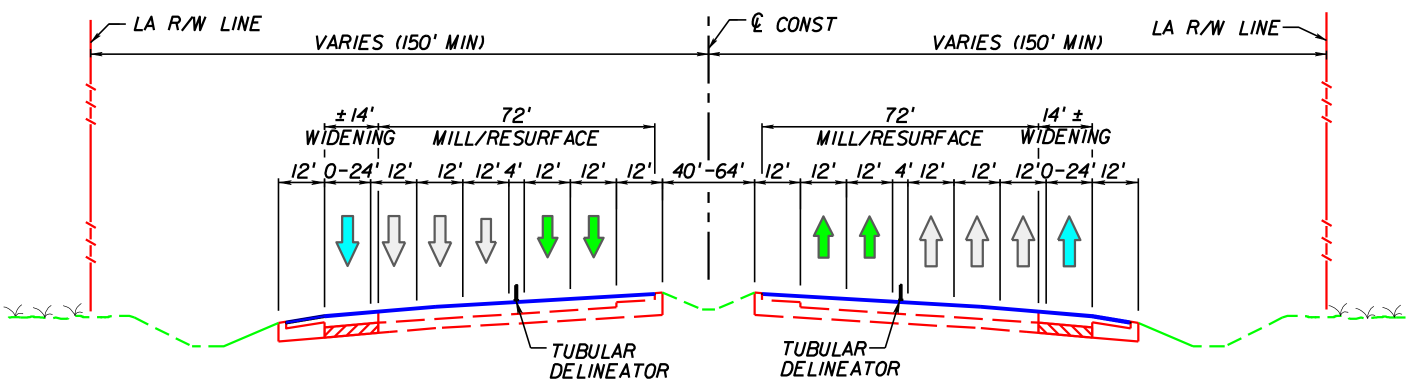




TYPICAL SECTION
FROM STIRLING ROAD TO I-595
AND FROM NORTH OF PARK & RIDE
TO OAKLAND PARK BLVD



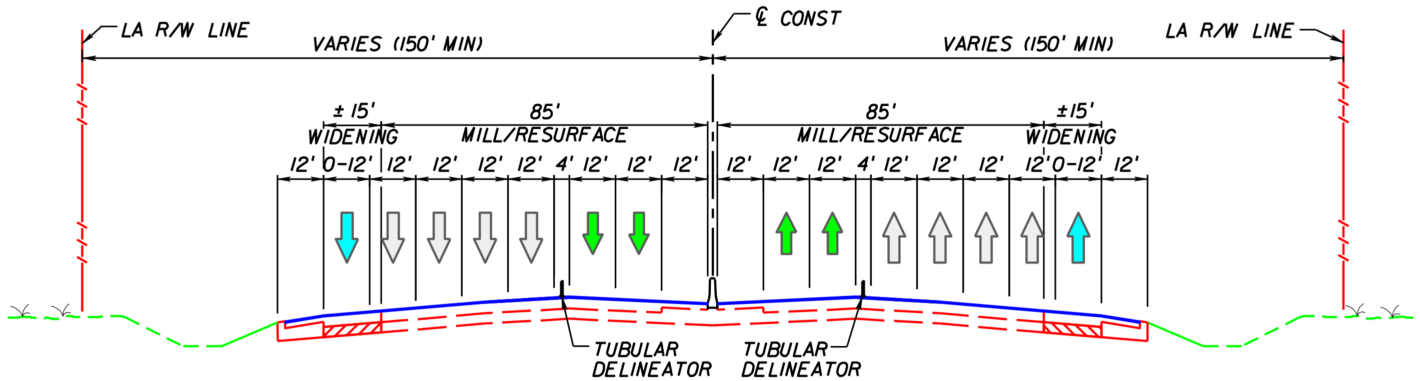
TYPICAL SECTION
FROM I-595 TO
SOUTH OF PARK & RIDE



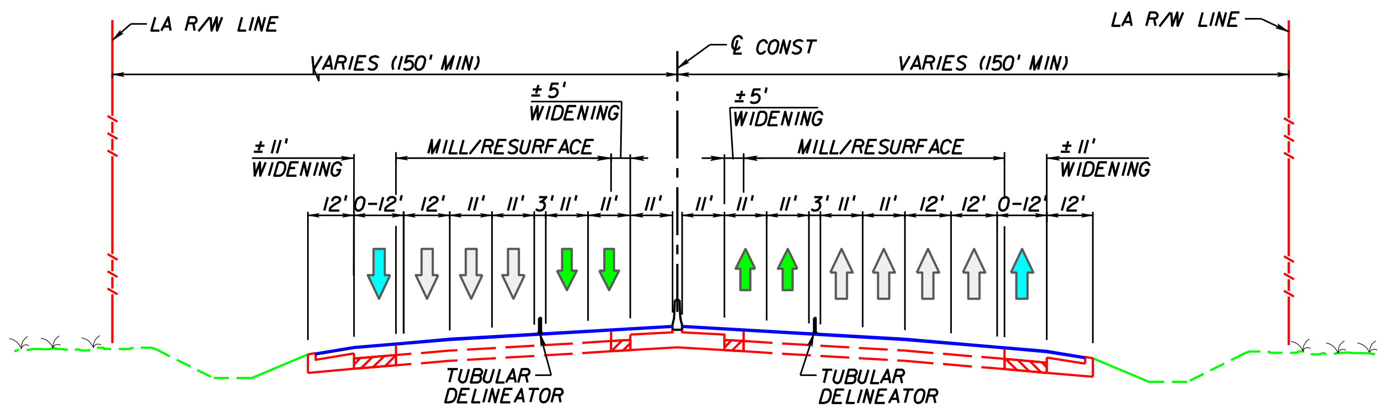
TYPICAL SECTION
FROM SOUTH OF PARK & RIDE
TO NORTH OF PARK & RIDE

I-95 (SR 9) PD&E STUDY FPID: 429804-1-22-01 July 2012	CONCEPT # 2	SHEET NO.
	CONCEPTUAL TYPICAL SECTION EVALUATION	2

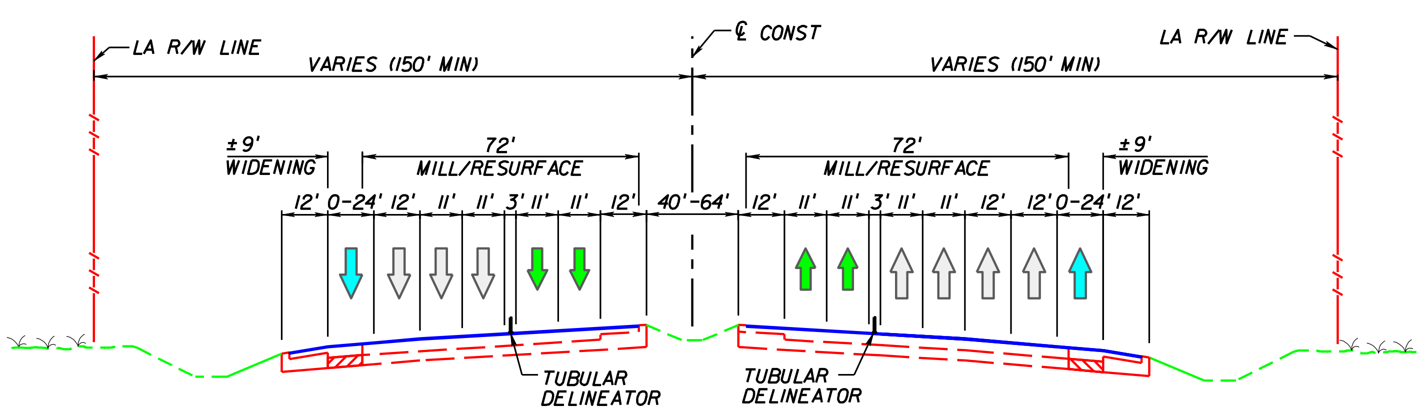
GENERAL PURPOSE LANE
AUXILIARY LANE
EXPRESS LANE



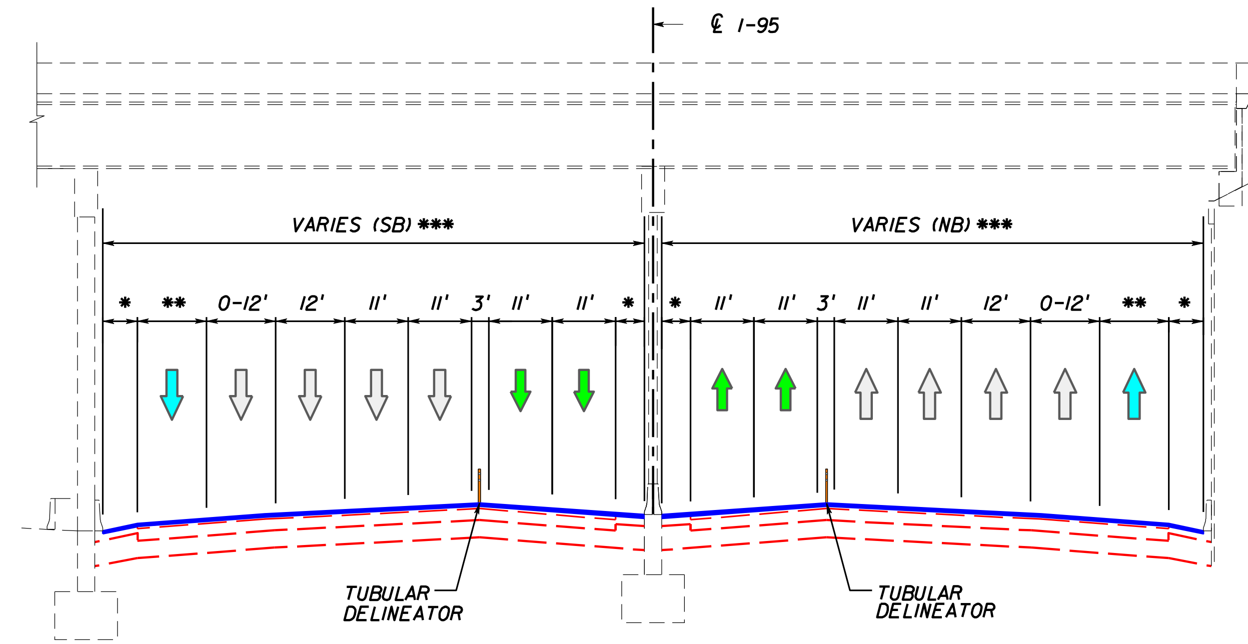
TYPICAL SECTION
FROM STIRLING ROAD TO SR 84
AND FROM SUNRISE BLVD
TO OAKLAND PARK BLVD



TYPICAL SECTION
FROM SR 84 TO
SOUTH OF PARK & RIDE AND
FROM NORTH OF PARK & RIDE
TO SUNRISE BLVD



TYPICAL SECTION
FROM SOUTH OF PARK & RIDE
TO NORTH OF PARK & RIDE



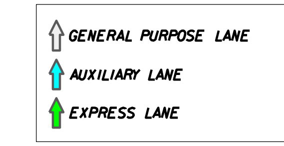
CONSTRAINED PRELIMINARY
TYPICAL SECTION

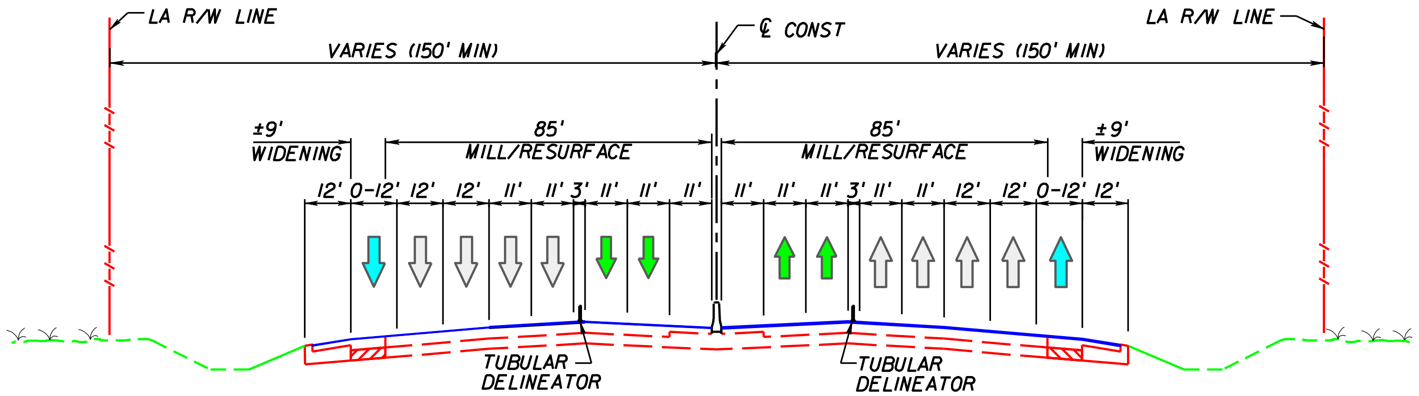
TYPICAL SECTIONS CONSTRAINED LOCATIONS						
UNDERPASS	DIRECTION	SHOULDER WIDTH *		AUX LANE **	NO. OF GL	TOTAL WIDTH ***
		OUTSIDE	INSIDE			
SW 42 ST	SB	3	8	12	4	94
	NB	3	8	12	4	94
SR 84	SB	9	8	0	3	76
	NB	9	8	0	3	76
SOUTH FORK NEW RIVER	SB	5	8	0	3	72
	NB	3	8	24	3	94
DAVIE BLVD	SB	3	8	12	3	88
	NB	12	11	15	3	122
SUNRISE BLVD	SB	3	8	0	4	82
	NB	3	8	12	4	94

I-95 (SR 9) PD&E STUDY
FPID: 429804-1-22-01
July 2012

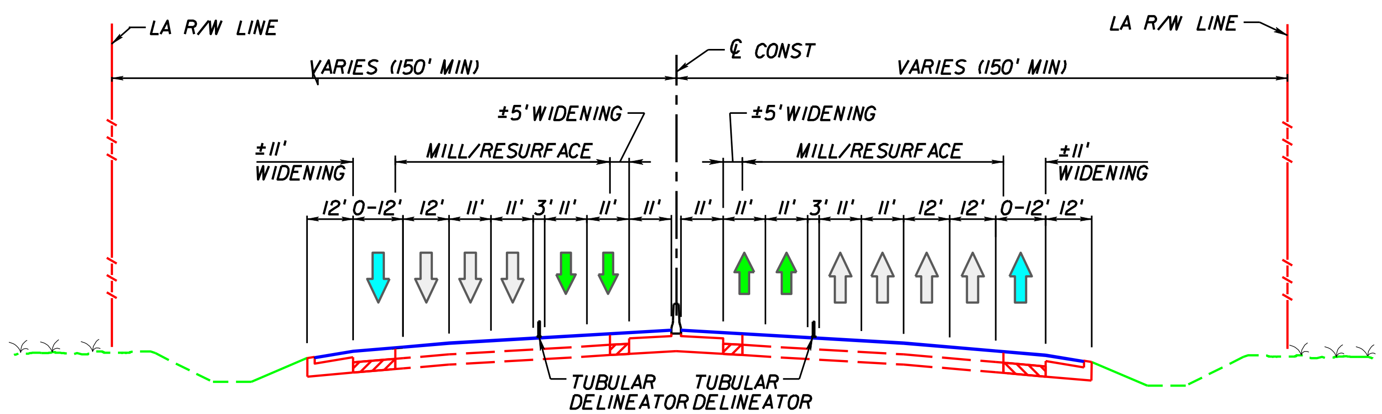
CONCEPT # 3
CONCEPTUAL TYPICAL SECTION EVALUATION

SHEET NO.
3

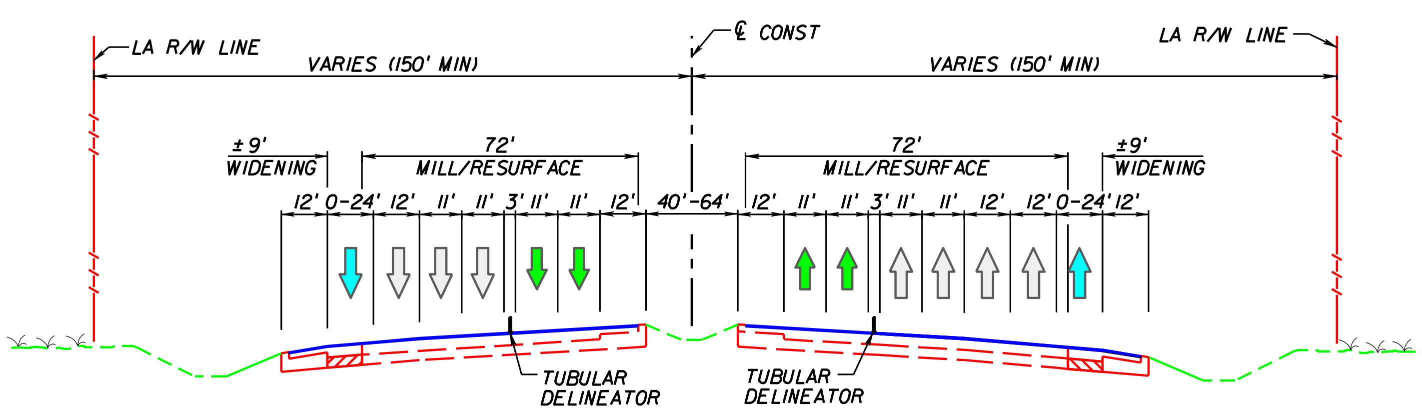




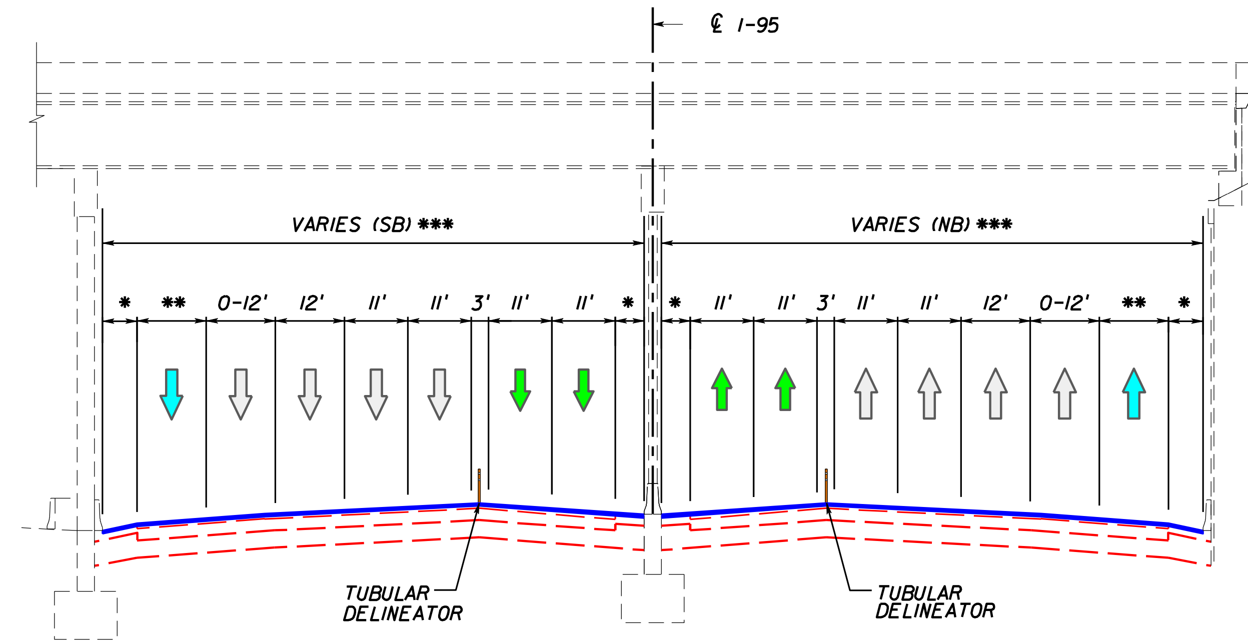
TYPICAL SECTION
FROM STIRLING ROAD TO I-595
AND FROM NORTH OF PARK & RIDE
TO OAKLAND PARK BLVD



TYPICAL SECTION
FROM I-595 TO
SOUTH OF PARK & RIDE



TYPICAL SECTION
FROM SOUTH OF PARK & RIDE
TO NORTH OF PARK & RIDE



CONSTRAINED PRELIMINARY
TYPICAL SECTION

TYPICAL SECTIONS CONSTRAINED LOCATIONS

UNDERPASS	DIRECTION	SHOULDER WIDTH *		AUX LANE **	NO. OF GL	TOTAL WIDTH ***
		OUTSIDE	INSIDE			
SW 42 ST	SB	3	8	12	4	94
	NB	3	8	12	4	94
SR 84	SB	9	8	0	3	76
	NB	9	8	0	3	76
SOUTH FORK NEW RIVER	SB	5	8	0	3	72
	NB	3	8	24	3	94
DAVIE BLVD	SB	3	8	12	3	88
	NB	12	11	15	3	122
SUNRISE BLVD	SB	3	8	0	4	82
	NB	3	8	12	4	94

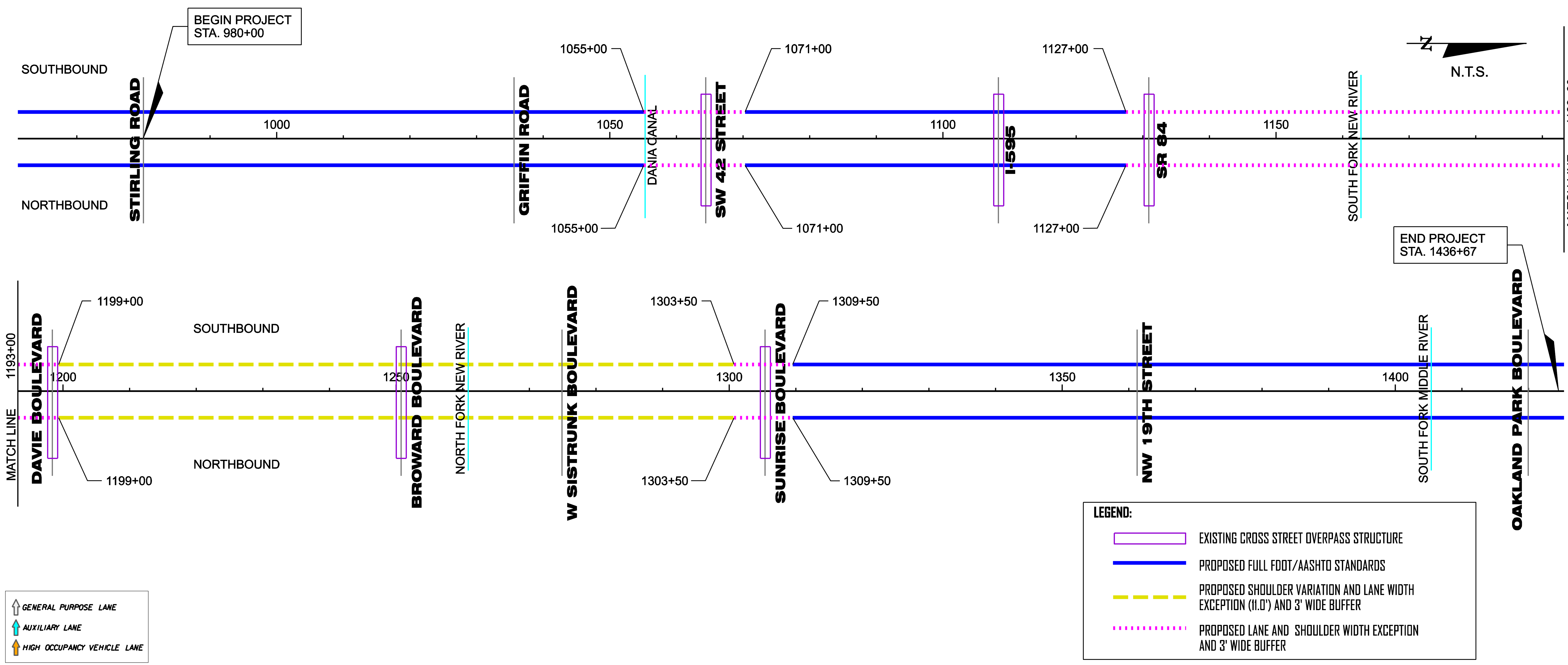
I-95 (SR 9) PD&E STUDY
FPID: 429804-1-22-01

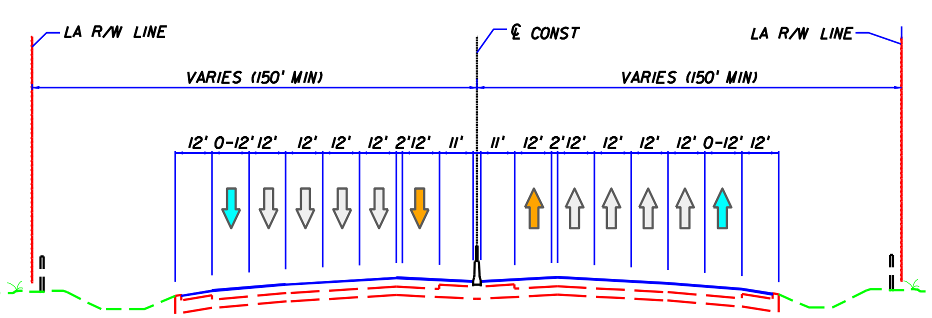
July 2012

CONCEPT # 4

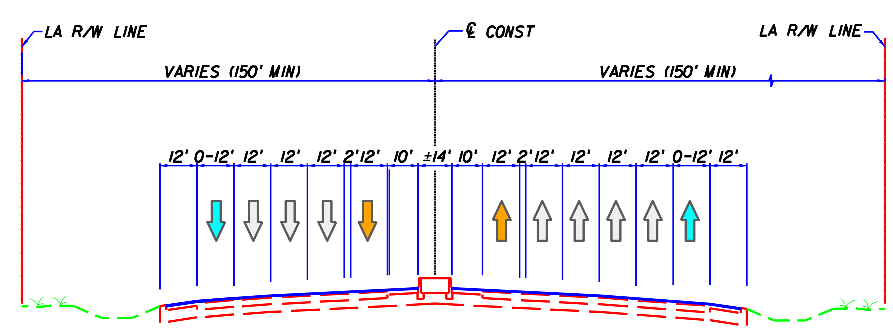
CONCEPTUAL TYPICAL SECTION EVALUATION

SHEET NO.
4

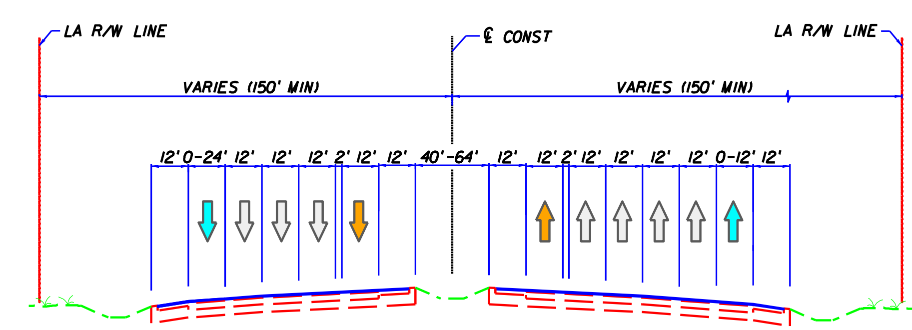




EXISTING TYPICAL SECTION
FROM STIRLING ROAD TO I-595
AND FROM NORTH OF PARK & RIDE
TO OAKLAND PARK BLVD



EXISTING TYPICAL SECTION
FROM I-595
TO SOUTH OF PARK & RIDE



EXISTING TYPICAL SECTION
FROM SOUTH OF PARK & RIDE
TO NORTH OF PARK & RIDE

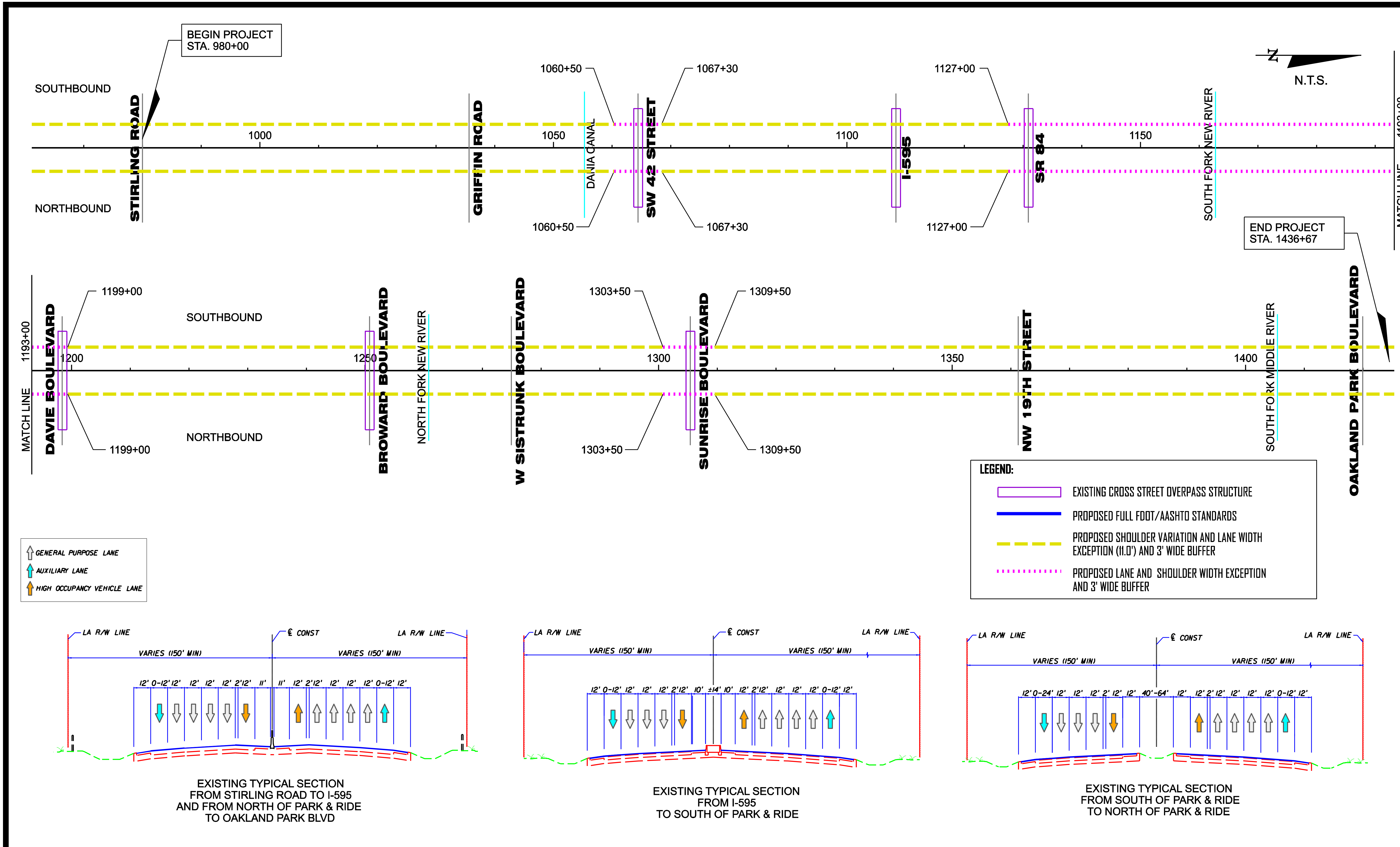
FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD COUNTY

JULY 2012

I-95 (SR 9) PD&E STUDY
FPID: 429804-1-22-01

CONCEPT # 3
SCHEMATIC LINE DIAGRAM

SHEET NO.
5



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD COUNTY

JULY 2012

I-95 (SR 9) PD&E STUDY
FPID: 429804-1-22-01

CONCEPT # 4
SCHEMATIC LINE DIAGRAM

SHEET NO. 6

I-95 (SR 9) PD&E STUDY from Stirling Road (MP 5.093) to Oakland Park Blvd (MP 13.742) FPID: 429804-1-22-01 Preliminary Typical Section Evaluation						
Section in Narrative	**Features**		**Concept #1 Barrier Wall Separated Express Lanes**	**Concept #2 Standard Tubular Marker Separated Express Lanes**	**Concept #3 Standard with Reduced Typical Section**	**Concept #4 I-95 Express Lanes Phase II**
3.1	**Roadway/Mainline**	Reconstruction	Yes	No	No	No
		Widening (Mill/Resurface/Overbuild)	No	Yes (14 - 18 feet)	Yes (9 - 15 feet)	Yes (9 - 11 feet)
		Design Variations	Border Width	Vertical Alignment Stopping Sight Distance Horizontal Curve Length Vertical Clearance Border Width	Vertical Alignment Stopping Sight Distance Horizontal Curve Length Vertical Clearance Border Width	Vertical Alignment Stopping Sight Distance Horizontal Curve Length Vertical Clearance Border Width
		Design Exceptions	No	No	Lane Width Shoulder Width	Lane Width Shoulder Width
	Interchanges	Ramp Realignment	All (IMR)	Partial (IMR)	Partial (IOAR)	Partial (IOAR)
		Design Modifications	Yes	Yes	No	No
3.2	**Structures**	Widening	12 bridges	17 bridges	17 bridges	17 bridges
		Replacement	39 bridges	20 bridges	No bridges	No bridges
3.3	**Drainage**	Off-Site Ponds	Yes	Yes	Yes	Yes
3.5	**Environmental Impacts**	Environmental Justice	Yes	No	No	No
		Wetlands	Most impacts anticipated	Less impacts than Concept #1, more impacts than Concepts #3 and #4	Less impacts than Concepts #1 and #2, more impacts than Concept #4	Least impacts anticipated
		Section 4(f) and Section 106	Most impacts anticipated	Less impacts than Concept #1	Less impacts than Concept #1	Less impacts than Concept #1
		Noise Impacts	Most impacts anticipated	Less impacts than Concept #1, more impacts than Concepts #3 and #4	Less impacts than Concepts #1 and #2, more impacts than Concept #4	Least impacts anticipated
3.5	**Right of Way**	Acquisition	25 acres for off-site ponds 36.2 acres for roadway and conveyance	20 acres for off-site ponds	20 acres for off-site ponds	20 acres for off-site ponds
		Relocation*	39 single family residential 2 apartment residential 7 commercial	No	No	No
3.6	**Utility Impacts**	-	Most impacts anticipated	Less impacts than Concept #1, more impacts than Concepts #3 and #4	Less impacts than Concepts #1 and #2, more impacts than Concept #4	Least impacts anticipated
3.7	**Maintenance of Traffic**	-	Most impacts anticipated	Less impacts than Concept #1, more impacts than Concepts #3 and #4	Less impacts than Concept #1 and Concept #2	Less impacts than Concept #1 and Concept #2
3.8	**Conceptual Construction Cost ****	-	$746 million	$243 million	$77 million	$74 million

* Off-site ponds may require relocation/displacements of both residential and commercial properties along the corridor

** Cost of potential right of way acquisition not included

APPENDIX C

Design Variation and Exception Summary

SR 9 / I-95 FROM STIRLING ROAD TO OAKLAND PARK BOULEVARD
SUMMARY OF VARIATIONS AND EXCEPTIONS

Geometric Design Element	65 mph - Existing		Concept #1		Concept #2		Concept #3		Concept #4		Comments
	Variations	Exceptions	Variations	Exceptions	Variations	Exceptions	Variations	Exceptions	Variations	Exceptions	
Vertical Curve Length	18	2	0	0	14	0	14	0	14	0	The 2 exceptions can be reduced to variations with overbuild. 6 variations can be eliminated with overbuild
K-Value	9	2	0	0	8	0	8	0	8	0	The 2 exceptions and 1 variation can be corrected with overbuild. Variations at crest curves.
Vertical Stopping Sight Distance	8	0	0	0	8	0	8	0	8	0	Reconstruction required to correct sight distance on crest curves
Horizontal Curve Length	12	0	0	0	12	0	12	0	12	0	Reconstruction required to correct curve lengths
Superelevation	0	4	0	0	0	0	0	0	0	0	All 4 exceptions can be eliminated with overbuild
Vertical Clearance	5	0	0	0	5	0	5	0	5	0	
Lane Width	0	0	0	0	0	0	0	1	0	1	Concept #3 from SR 84 to Sunrise Blvd. Concept #4 entire project.
Shoulder Width	0	1	0	0	0	0	0	1	0	1	Concept #3 from SR 84 to Sunrise Blvd. Concept #4 entire project.
Border Width	1	0	1	0	1	0	1	0	1	0	

TABLE 1
SR 9 / I-95 FROM STIRLING ROAD TO OAKLAND PARK BOULEVARD
HORIZONTAL ALIGNMENT EVALUATION

Mainline - Horizontal Curve Length														
		PI Station					60 mph		65 mph		Variances & Exceptions		Comment	Source
	Baseline	Baseline	Centerline	Exist. Design Speed	R	L	Desirable	Minimum	Desirable	Minimum	60 mph	65 mph		
H1	NB & SB			60	5779.600	1,069.93	1800	900	1950	975	OK	OK		Topo and Masterplan
H2	NB & SB			60	5779.570	1,073.41	1800	900	1950	975	OK	OK		Topo and Masterplan
H3	NB & SB		60+86.83	60	28647.890	2,003.86	1800	900	1950	975	OK	OK		FPID 231732-1 and Masterplan
H4	NB & SB		93+28.43	60	5729.580	2,294.28	1800	900	1950	975	OK	OK		FPID 231732-1 and Masterplan
H5	NB & SB		121+45.17	60	28647.890	2,333.47	1800	900	1950	975	OK	OK		FPID 231732-1 and Masterplan
H6	NB & SB		137+29.36	60	11459.160	835.82	1800	900	1950	975	Variance	Variance	Reconstruct required to correct	FPID 231732-1 and Masterplan
H7	NB & SB		152+46.04	60	11459.160	682.42	1800	900	1950	975	Variance	Variance	Reconstruct required to correct	FPID 231732-1 and Masterplan
H8	NB & SB		182+08.93	70	22918.310	1,882.44	1800	900	1950	975	OK	OK		FPID 231732-1 and Masterplan
H9	NB		205+61.08	70	22918.310	2,619.89	1800	900	1950	975	OK	OK		FPID 231732-1 and Masterplan
H10	NB		230+96.91	70	22918.310	1,195.56	1800	900	1950	975	OK	OK		State Project No 86095-3463
H11	NB		245+78.61	70	9152.478	763.35	1800	900	1950	975	Variance	Variance	Reconstruct required to correct	State Project No 86095-3463 and approximation from Topo
H12	NB				35000.000	1,868.40	1800	900	1950	975	OK	OK		Approximated from Topo
H13	NB				11402.130	891.46	1800	900	1950	975	Variance	Variance	Reconstruct required to correct	Approximated from Topo
H14	SB		203+04.41	70	16370.223	700.97	1800	900	1950	975	Variance	Variance	Reconstruct required to correct	State Project No 86095-3463
H15	SB		208+90.20	70	22889.062	469.58	1800	900	1950	975	Variance	Variance	Reconstruct required to correct	State Project No 86095-3463
H16	SB		213+62.72	70	6875.493	474.50	1800	900	1950	975	Variance	Variance	Reconstruct required to correct	State Project No 86095-3463
H17	SB		226+12.69	70	11459.156	1,491.83	1800	900	1950	975	OK	OK		State Project No 86095-3463
H18	SB		247+16.06	60	4063.890	556.21	1800	900	1950	975	Variance	Variance	Reconstruct required to correct	State Project No 86095-3463 and approximation from Topo
H19	SB	-	-		6000.000	685.00	1800	900	1950	975	Variance	Variance	Reconstruct required to correct	Approximated from Topo
H20	NB & SB	618+03.84	317+39.18	60	11459.160	737.54	1800	900	1950	975	Variance	Variance	Reconstruct required to correct	FPID 231734-1
H21	NB & SB	642+84.30	342+25.64	60	4583.659	2,053.77	1800	900	1950	975	OK	OK		FPID 231734-1
H22	NB & SB	697+28.74	396+69.93	60	5729.580	947.11	1800	900	1950	975	OK	Variance	Reconstruct required to correct	FPID 231734-1
H23	NB & SB	721+15.82		60	5729.580	947.11	1800	900	1950	975	OK	Variance	Reconstruct required to correct	FPID 231734-1
											10	**12**		

TABLE 2
SR 9 / I-95 FROM STIRLING ROAD TO OAKLAND PARK BOULEVARD
SUPERELEVATION EVALUATION

Mainline - Superelevation Analysis														
		PI Station					60 mph		65 mph		Variances & Exceptions		Comment	Source
	Baseline	Baseline	Centerline	Exist. Design Speed	R	e	PPM	AASHTO	PPM	AASHTO	60 mph	65 mph		
H1	NB & SB			60	5779.600	0.030	0.030	0.029	0.033	0.033	OK	Exception	2.16 inches of OB to correct	Topo and Masterplan
H2	NB & SB			60	5779.570	0.030	0.030	0.029	0.033	0.033	OK	Exception	2.16 inches of OB to correct	Topo and Masterplan
H3	NB & SB		60+86.83	60	28647.890	0.020	NC	NC	NC	NC	OK	OK		FPID 231732-1 and Masterplan
H4	NB & SB		93+28.43	60	5729.580	0.032	0.030	0.029	0.033	0.033	OK	Exception	0.72 inches of OB to correct	FPID 231732-1 and Masterplan
H5	NB & SB		121+45.17	60	28647.890	0.020	NC	NC	NC	NC	OK	OK		FPID 231732-1 and Masterplan
H6	NB & SB		137+29.36	60	11459.160	0.020	0.020	0.020	0.020	0.020	OK	OK		FPID 231732-1 and Masterplan
H7	NB & SB		152+46.04	60	11459.160	0.030	0.020	0.020	0.020	0.020	OK	OK		FPID 231732-1 and Masterplan
H8	NB & SB		182+08.93	70	22918.310	0.020	NC	NC	NC	NC	OK	OK		FPID 231732-1 and Masterplan
H9	NB		205+61.08	70	22918.310	0.020	NC	NC	NC	NC	OK	OK		FPID 231732-1 and Masterplan
H10	NB		230+96.91	70	22918.310	0.020	NC	NC	NC	NC	OK	OK		State Project No 86095-3463
H11	NB		245+78.61	70	9152.478	0.030	0.022	0.022	0.023	0.023	OK	OK		State Project No 86095-3463 and approximation from Topo
H12	NB				35000.000									Approximated from Topo
H13	NB				11402.130									Approximated from Topo
H14	SB		203+04.41	70	16370.223	0.020	NC	NC	NC	NC	OK	OK		State Project No 86095-3463
H15	SB		208+90.20	70	22889.062	0.020	NC	NC	NC	NC	OK	OK		State Project No 86095-3463
H16	SB		213+62.72	70	6875.493	0.031	0.026	0.025	0.028	0.028	OK	OK		State Project No 86095-3463
H17	SB		226+12.69	70	11459.156	0.030	0.020	0.020	0.020	0.020	OK	OK		State Project No 86095-3463
H18	SB		247+16.06	60	4063.890	0.037	0.041	0.040	0.046	0.045	Exception	Exception	5.76 inches of OB to correct	State Project No 86095-3463 and approximation from Topo
H19	SB	-	-		6000.000									Approximated from Topo
H20	NB & SB	618+03.84	317+39.18	60	11459.160	0.020	0.020	0.020	0.020	0.020	OK	OK		FPID 231734-1
H21	NB & SB	642+84.30	342+25.64	60	4583.659	0.047	0.036	0.036	0.041	0.041	OK	OK		FPID 231734-1
H22	NB & SB	697+28.74	396+69.93	60	5729.580	0.037	0.030	0.029	0.033	0.033	OK	OK		FPID 231734-1
H23	NB & SB	721+15.82		60	5729.580	0.039	0.030	0.029	0.033	0.033	OK	OK		FPID 231734-1
										Variation	**0**	**0**		
										Exception	**1**	**4**		

TABLE 3
SR 9 / I-95 FROM STIRLING ROAD TO OAKLAND PARK BOULEVARD
VERTICAL ALIGNMENT (CURVE LENGTH) EVALUATION

Mainline - Vertical Curve Length														
Curve No.	Direction	Vertical Curve Type	Back Grade	Ahead Grade	Δ G	Existing Curve Length	60 mph		65 mph		Variances and Exceptions		Comment	Source
							PPM	AASHTO	PPM	AASHTO	60 MPH	65 MPH		
1	NB & SB	Sag	0.000	3.000	3.000	450.00	800.00	408.00	800.00	471.00	Variance	Exception	1-in OB to correct Exception. 15.6-in OB to correct variation.	Masterplan
2	NB & SB	Crest	3.000	3.000	6.000	1800.00	1800.00	906.00	1800.00	1158.00	OK	OK		Masterplan
3	NB & SB	Sag	3.000	0	3.000	450.00	800.00	408.00	800.00	471.00	Variance	Exception	1-in OB to correct Exception. 15.6-in OB to correct variation.	Masterplan
4	SB	Sag	0.0000	2.5220	2.522	825.00	800.00	342.99	800.00	395.95	OK	OK		Masterplan
5	NB	Sag	0.0000	2.5220	2.522	800.00	800.00	342.99	800.00	395.95	OK	OK		Masterplan
6	NB & SB	Crest	2.522	2.434	4.956	1500.00	1800.00	748.36	1800.00	956.51	Variance	Variance	Reconstruction required to correct.	Masterplan
7	NB & SB	Sag	2.434	0.000	2.434	440.00	800.00	331.02	800.00	382.14	Variance	Variance	13-in OB to correct variation.	Masterplan
8	NB & SB	Sag	0.000	1.500	1.500	600.00	800.00	204.00	800.00	235.50	Variance	Variance	4.5-in OB to correct variation.	Masterplan
9	NB & SB	Crest	1.500	0.500	2.000	640.00	1000.00	302.00	1000.00	386.00	Variance	Variance	Reconstruction required to correct.	Masterplan
10	NB & SB	Sag	0.500	0.302	0.802	500.00	800.00	109.07	800.00	125.91	Variance	Variance	3.6-in OB to correct variation.	Masterplan
11	NB	Sag	0.3020	0.300	0.602	440.00	800.00	81.87	800.00	94.51	Variance	Variance	3.2-in OB to correct variation.	Masterplan
12	SB	Sag	0.302	0.300	0.602	500.00	800.00	81.87	800.00	94.51	Variance	Variance	2.7-in OB to correct variation.	Masterplan
13	NB	Crest	0.300	0.300	0.600	500.00	1000.00	90.60	1000.00	115.80	Variance	Variance	Reconstruction required to correct.	Masterplan
14	SB	Crest	0.300	0.300	0.600	500.00	1000.00	90.60	1000.00	115.80	Variance	Variance	Reconstruction required to correct.	Masterplan
15	NB & SB	Sag	0.300	0.300	0.600	500.00	800.00	81.60	800.00	94.20	Variance	Variance	2.7-in OB to correct variation.	Masterplan
16	NB & SB	Crest	0.300	0.300	0.600	500.00	1000.00	90.60	1000.00	115.80	Variance	Variance	Reconstruction required to correct.	Masterplan
17	NB & SB	Sag	0.300	3.000	3.300	778.00	800.00	448.80	800.00	518.10	Variance	Variance	1.1-in OB to correct variation.	Masterplan
18	NB & SB	Crest	3.000	3.000	6.000	1800.00	1000.00	906.00	1000.00	1158.00	OK	OK		Masterplan
19	NB & SB	Sag	3.000	0.750	2.250	1000.00	800.00	306.00	800.00	353.25	OK	OK		Masterplan
20	NB & SB	Sag	0.750	0.400	1.150	1000.00	800.00	156.40	800.00	180.55	OK	OK		Masterplan
21	NB & SB	Crest	0.400	0.9	1.300	1000.00	1000.00	196.30	1000.00	250.90	OK	OK		Masterplan
22	NB & SB	Sag	0.9000	0.4200	1.320	800.00	800.00	179.52	800.00	207.24	OK	OK		Masterplan
23	SB	Crest	0.4200	0.3700	0.790	1000.00	1000.00	119.29	1000.00	152.47	OK	OK		Masterplan
24	NB	Crest	0.420	0.300	0.720	1000.00	1000.00	108.74	1000.00	138.98	OK	OK		Masterplan
25	**NB**	Sag	0.300	0.414	0.714	800.00	800.00	97.10	800.00	112.10	OK	OK		Masterplan
26	SB	Sag	2.117	0.000	2.117	800.00	800.00	287.95	800.00	332.42	OK	OK		Masterplan
27	NB	Sag	2.137	0.000	2.137	800.00	800.00	290.63	800.00	335.51	OK	OK		Masterplan
28	SB	Sag	0.000	0.109	0.109	800.00	800.00	14.84	800.00	17.13	OK	OK		Masterplan
29	NB	Sag	0.000	0.1040	0.104	800.00	800.00	14.14	800.00	16.33	OK	OK		Masterplan
30	SB	Sag	0.1091	2.468	2.359	600.00	800.00	320.82	800.00	370.36	Variance	Variance	7-in OB to correct variation.	Masterplan
31	NB	Sag	0.104	2.503	2.399	600.00	800.00	326.25	800.00	376.63	Variance	Variance	7.14-in OB to correct variation.	Masterplan
32	SB	Crest	2.47	2.48	4.952	1300.00	1000.00	747.77	1000.00	955.76	OK	OK		Masterplan
33	NB	Crest	2.50	2.50	4.998	1300.00	1000.00	754.74	1000.00	964.67	OK	OK		Masterplan
34	SB	Sag	2.484	0.000	2.484	800.00	800.00	337.82	800.00	389.99	OK	OK		Masterplan
35	NB	Sag	2.496	0.000	2.496	800.00	800.00	339.51	800.00	391.93	OK	OK		Masterplan
36	SB	Sag	0.000	2.478	2.478	600.00	800.00	336.97	800.00	389.00	Variance	Variance	7.38-in OB to correct variation.	Masterplan
37	NB	Sag	0.000	2.515	2.515	600.00	800.00	342.00	800.00	394.81	Variance	Variance	7.49-in OB to correct variation.	Masterplan
38	SB	Crest	2.478	2.007	4.485	1170.00	1800.00	677.25	1800.00	865.62	Variance	Variance	Reconstruction required to correct.	Masterplan
39	NB	Crest	2.515	2.023	4.538	1170.00	1800.00	685.25	1800.00	875.85	Variance	Variance	Reconstruction required to correct.	Masterplan
										Variation	**20**	**18**		
										Exception	**0**	**2**		

TABLE 4
SR 9 / I-95 FROM STIRLING ROAD TO OAKLAND PARK BOULEVARD
VERTICAL ALIGNMENT (K-VALUE) EVALUATION

Mainline - Vertical Curve K-Values														
Curve No.	Direction	Vertical Curve Type	Back Grade	Ahead Grade	Δ G	Existing K-Values	60 mph		65 mph		Variances and Exceptions		Comment	Source
							PPM	AASHTO	PPM	AASHTO	60 MPH	65 MPH		
1	NB & SB	Sag	0.000	3.000	6.000	150.00	157.00	136.00	181.00	157.00	Variance	Exception	1-in OB to correct Exception. 4-in OB to correct variation.	Masterplan
2	NB & SB	Crest	3.000	3.000	6.000	300.00	313.00	151.00	401.00	193.00	Variance	Variance	Reconstruction required to correct.	Masterplan
3	NB & SB	Sag	3.000	0	3.000	150.00	157.00	136.00	181.00	157.00	Variance	Exception	1-in OB to correct Exception. 4-in OB to correct variation.	Masterplan
4	SB	Sag	0.0000	2.5220	2.522	327.12	157.00	136.00	181.00	157.00	OK	OK		Masterplan
5	NB	Sag	0.0000	2.5220	2.522	317.21	157.00	136.00	181.00	157.00	OK	OK		Masterplan
6	NB & SB	Crest	2.522	2.434	4.956	302.66	313.00	151.00	401.00	193.00	Variance	Variance	Reconstruction required to correct.	Masterplan
7	NB & SB	Sag	2.434	0.000	2.434	180.77	157.00	136.00	181.00	157.00	OK	Variance	0.02-in OB to correct variation.	Masterplan
8	NB & SB	Sag	0.000	1.500	1.500	400.00	157.00	136.00	181.00	157.00	OK	OK		Masterplan
9	NB & SB	Crest	1.500	0.500	2.000	320.00	313.00	151.00	401.00	193.00	OK	Variance	Reconstruction required to correct.	Masterplan
10	NB & SB	Sag	0.500	0.302	0.802	623.44	157.00	136.00	181.00	157.00	OK	OK		Masterplan
11	NB	Sag	0.3020	0.300	0.602	730.90	157.00	136.00	181.00	157.00	OK	OK		Masterplan
12	SB	Sag	0.302	0.300	0.602	830.56	157.00	136.00	181.00	157.00	OK	OK		Masterplan
13	NB	Crest	0.300	0.300	0.600	833.33	313.00	151.00	401.00	193.00	OK	OK		Masterplan
14	SB	Crest	0.300	0.300	0.600	833.33	313.00	151.00	401.00	193.00	OK	OK		Masterplan
15	NB & SB	Sag	0.300	0.300	0.600	833.33	157.00	136.00	181.00	157.00	OK	OK		Masterplan
16	NB & SB	Crest	0.300	0.300	0.600	833.33	313.00	151.00	401.00	193.00	OK	OK		Masterplan
17	NB & SB	Sag	0.300	3.000	3.300	235.76	157.00	136.00	181.00	157.00	OK	OK		Masterplan
18	NB & SB	Crest	3.000	3.000	6.000	300.00	313.00	151.00	401.00	193.00	Variance	Variance	Reconstruction required to correct.	Masterplan
19	NB & SB	Sag	3.000	0.750	2.250	444.44	157.00	136.00	181.00	157.00	OK	OK		Masterplan
20	NB & SB	Sag	0.750	0.400	1.150	869.57	157.00	136.00	181.00	157.00	OK	OK		Masterplan
21	NB & SB	Crest	0.400	0.9	1.300	769.23	313.00	151.00	401.00	193.00	OK	OK		Masterplan
22	NB & SB	Sag	0.9000	0.4200	1.320	606.06	157.00	136.00	181.00	157.00	OK	OK		Masterplan
23	SB	Crest	0.4200	0.3700	0.790	1265.82	313.00	151.00	401.00	193.00	OK	OK		Masterplan
24	NB	Crest	0.420	0.300	0.720	1388.70	313.00	151.00	401.00	193.00	OK	OK		Masterplan
25	**NB**	Sag	0.300	0.414	0.714	1120.45	157.00	136.00	181.00	157.00	OK	OK		Masterplan
26	SB	Sag	2.117	0.000	2.117	377.84	157.00	136.00	181.00	157.00	OK	OK		Masterplan
27	NB	Sag	2.137	0.000	2.117	374.36	157.00	136.00	181.00	157.00	OK	OK		Masterplan
28	SB	Sag	0.000	0.109	0.109	7332.72	157.00	136.00	181.00	157.00	OK	OK		Masterplan
29	NB	Sag	0.000	0.1040	0.104	7692.31	157.00	136.00	181.00	157.00	OK	OK		Masterplan
30	SB	Sag	0.1091	2.468	2.359	254.35	157.00	136.00	181.00	157.00	OK	OK		Masterplan
31	NB	Sag	0.104	2.503	2.399	250.11	157.00	136.00	181.00	157.00	OK	OK		Masterplan
32	SB	Crest	2.47	2.48	4.95	262.51	313.00	151.00	401.00	193.00	Variance	Variance	Reconstruction required to correct.	Masterplan
33	NB	Crest	2.50	2.50	5.00	260.09	313.00	151.00	401.00	193.00	Variance	Variance	Reconstruction required to correct.	Masterplan
34	SB	Sag	2.484	0.000	2.484	322.06	157.00	136.00	181.00	157.00	OK	OK		Masterplan
35	NB	Sag	2.496	0.000	2.496	320.46	157.00	136.00	181.00	157.00	OK	OK		Masterplan
36	SB	Sag	0.000	2.478	2.478	242.16	157.00	136.00	181.00	157.00	OK	OK		Masterplan
37	NB	Sag	0.000	2.515	2.515	238.60	157.00	136.00	181.00	157.00	OK	OK		Masterplan
38	SB	Crest	2.478	2.007	4.485	260.86	313.00	151.00	401.00	193.00	Variance	Variance	Reconstruction required to correct.	Masterplan
39	NB	Crest	2.515	2.023	4.538	257.82	313.00	151.00	401.00	193.00	Variance	Variance	Reconstruction required to correct.	Masterplan
										Variation	**9**	**9**		
										Exception	**0**	**2**		

TABLE 5
SR 9 / I-95 FROM STIRLING ROAD TO OAKLAND PARK BOULEVARD
VERTICAL SIGHT DISTANCE EVALUATION

Mainline - Vertical Stopping Sight Distance															
Curve No.	PVI - VC	Vertical Curve Type	Back Grade	Ahead Grade	Δ G	Existing Curve Length	Existing Stopping Sight Distance		60 mph		65 mph		Variances and Exceptions		Source
							PPM	AASHTO	PPM	AASHTO	PPM	AASHTO	60 MPH	65 MPH	
2	NB & SB	Crest	3.000	3.000	6.000	1800.00	631.46	804.67	645.00	570.00	730.00	645.00	Variance	Variance	Masterplan
6	NB & SB	Crest	2.522	2.434	4.956	1500.00	634.26	808.23	645.00	570.00	730.00	645.00	Variance	Variance	Masterplan
9	NB & SB	Crest	1.500	0.500	2.000	640.00	652.17	831.06	645.00	570.00	730.00	645.00	OK	Variance	Masterplan
14	NB	Crest	0.300	0.300	0.600	500.00	1052.44	1341.11	645.00	570.00	730.00	645.00	OK	OK	Masterplan
15	SB	Crest	0.300	0.300	0.600	500.00	1052.44	1341.11	645.00	570.00	730.00	645.00	OK	OK	Masterplan
17	NB & SB	Crest	0.300	0.300	0.600	500.00	1052.44	1341.11	645.00	570.00	730.00	645.00	OK	OK	Masterplan
19	NB & SB	Crest	3.000	3.000	6.000	1800.00	631.46	804.67	645.00	570.00	730.00	645.00	Variance	Variance	Masterplan
22	NB & SB	Crest	0.400	0.9	1.300	1000.00	1011.15	1288.50	645.00	570.00	730.00	645.00	OK	OK	Masterplan
24	SB	Crest	0.4200	0.3700	0.790	1000.00	1297.10	1652.88	645.00	570.00	730.00	645.00	OK	OK	Masterplan
25	NB	Crest	0.420	0.300	0.720	1000.00	1358.60	1731.25	645.00	570.00	730.00	645.00	OK	OK	Masterplan
33	SB	Crest	2.47	2.48	4.952	1300.00	590.70	752.72	645.00	570.00	730.00	645.00	Variance	Variance	Masterplan
34	NB	Crest	2.50	2.50	4.998	1300.00	587.96	749.23	645.00	570.00	730.00	645.00	Variance	Variance	Masterplan
39	SB	Crest	2.478	2.007	4.485	1170.00	588.84	750.35	645.00	570.00	730.00	645.00	Variance	Variance	Masterplan
40	NB	Crest	2.515	2.023	4.538	1170.00	585.39	745.95	645.00	570.00	730.00	645.00	Variance	Variance	Masterplan
												Variation	7	8	
												Exception	0	0	

TABLE 6

SR 9 / I-95 FORM STIRLING ROAD TO OAKLAND PARK BOULEVARD
HORIZONTAL SIGHT DISTANCE EVALUATION

Mainline - Horizontal Sight Distance														
							60 mph		65 mph		Variances & Exceptions		Comment	Source
	Direction	Exist. Design Speed	R	L	HSO	SSD	PPM	AASHTO	PPM	AASHTO	60 mph	65 mph		
H1	NB & SB	60	5779.600	1,069.93	16.50	874	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H2	NB & SB	60	5779.570	1,073.41	16.50	874	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H3	NB & SB	60	28647.890	2,003.86	11.50	1623	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H4	NB & SB	60	5729.580	2,294.28	16.50	870	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H5	NB & SB	60	28647.890	2,333.47	16.50	1945	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H6	NB & SB	60	11459.160	835.82	11.50	1027	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H7	NB & SB	60	11459.160	682.42	11.50	1027	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H8	NB & SB	70	22918.310	1,882.44	11.50	1452	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H9	NB	70	22918.310	2,619.89	11.50	1452	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H10	NB	70	22918.310	1,195.56	11.50	1452	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H11	NB	70	9152.478	763.35	16.50	1099	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H12	NB		35000.000	1,868.40	11.50	1794	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H13	NB		11402.130	891.46	16.50	1227	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H14	SB	70	16370.223	700.97	16.50	1470	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H15	SB	70	22889.062	469.58	16.50	1738	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H16	SB	70	6875.493	474.50	16.50	953	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H17	SB	70	11459.156	1,491.83	11.50	1027	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H18	SB	60	4063.890	556.21	40.00	1141	645.00	570.00	730.00	645.00	OK	OK	HSO measured to pier	HSO from Topo
H19	SB		6000.000	685.00	42.00	1421	645.00	570.00	730.00	645.00	OK	OK	HSO to inside barrier wall	HSO from Topo
H20	NB & SB	60	11459.160	737.54	16.50	1230	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H21	NB & SB	60	4583.659	2,053.77	16.50	778	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H22	NB & SB	60	5729.580	947.11	16.50	870	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
H23	NB & SB	60	5729.580	947.11	16.50	870	645.00	570.00	730.00	645.00	OK	OK		HSO from Topo
										Variation	**0**	**0**		
										Exception	**0**	**0**		

TABLE 7
SR 9 / I-95 FROM STIRLING ROAD TO OAKLAND PARK BOULEVARD
VERTICAL CLEARANCE EVALUATION

Vertical Clearance						
Location	**SB**	**NB**	**PPM**	**AASHTO**	**Variances and Exceptions**	**Comments**
SW 42nd Street	28.85	28.03	16.50	16.00	OK	
I-595	16.66	16.43	16.50	16.00	Variation	Measured at shoulder
I-595 to I-95 SB	16.33	16.84	16.50	16.00	Variation	Measured at aux lane
I-595 to I-95 NB	44.15	38.37	16.50	16.00	OK	
SR 84 EB	45.35	43.20	16.50	16.00	OK	
SR 84 WB	19.36	17.28	16.50	16.00	OK	
Davie Boulevard	17.40	17.38	16.50	16.00	OK	
NB Ramp from I-95 to Broward Blvd over NB Ramp from Davie Blvd to I-95	-	16.56	16.50	16.00	OK	
SB Ramp from Broward Blvd to I-95 over SB Ramp from I-95 to Davie Blvd	16.47	-	16.50	16.00	Variation	Measured at shoulder
Park and Ride (south of Broward Blvd)	18.02	-	16.50	16.00	OK	
Broward Blvd Ramp to I-95 NB	43.63	43.35	16.50	16.00	OK	
Broward Boulevard	20.97	17.09	16.50	16.00	OK	
Park and Ride (north of Broward Blvd)	16.02	-	16.50	16.00	Variation	
Sunrise Boulevard	18.58	16.41	16.50	16.00	Variation	
			Variations		5	

TABLE 8
SR 9 / I-95 FROM STIRLING ROAD TO OAKLAND PARK BOULEVARD
BORDER EVALUATION

Existing Border Width									
Location	Baseline Station		Left		Right		PPM	AASHTO	Variation or Exception
	From	To	Min	Max	Min	Max			
Stirling Road to SW 42 Street	282+12	356+00	9	65	10	62	94-ft	8-ft	Variation
SW 42 Street to I-595	356+00	400+00	11	147	22	110	94-ft	8-ft	Variation
I-595 to South Fork New River	400+00	470+00	14	14	21	129	94-ft	8-ft	Variation
South Fork New River to just north of Sistrunk Blvd	470+00	586+00	9	88	25	178	94-ft	8-ft	Variation
Just north of Sistrunk Blvd to Oakland Park Blvd	586+00	735+00	36	60	13	104	94-ft	8-ft	Variation

APPENDIX C

13-Point Concurrency Memorandum

SR 9 / I-95 PD&E STUDY

FROM STIRLING ROAD TO NORTH OF OAKLAND PARK BOULEVARD
FM 42980412201 / ETDM 13168
Broward County

13 Point Concurrency Memorandum

June 2013

Prepared for:

Florida Department of Transportation – District 4
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Project Description

This segment of I-95 is functionally classified as a Divided Urban Principal Arterial Interstate and is part of the state's Strategic Intermodal System (SIS). I-95 is one of only two major expressways (Florida's Turnpike being the other) that connect the major employment centers and residential areas within the South Florida tri-county area: Miami-Dade, Broward and Palm Beach Counties. I-95 is a critical corridor for moving freight, transit and passenger vehicles into, through and out of the corridor each day.

The majority of the project corridor has eight travel lanes, four in each direction, plus auxiliary lanes within closely spaced interchanges. The remainder of the corridor features a few segments that carry six and ten general purpose travel lanes. The northbound and southbound travel lanes are separated by either a concrete barrier wall, or a grassy median. Roadway swales run on both sides of the facility. There are eight interchanges along the project corridor:

- Stirling Road (SR 848) & I-95
- Griffin Road (SR 818) & I-95
- I-595 & I-95
- SR 84 & I-95
- Davie Boulevard (SR 736) & I-95
- Broward Boulevard (SR 842) & I-95
- Sunrise Boulevard (SR 838) & I-95
- Oakland Park Boulevard (SR 816) & I-95

The project segment traverses a dense urban area with predominantly commercial and residential uses. Within the project limits, I-95 traverses five cities (Hollywood, Dania Beach, Fort Lauderdale, Wilton Manors and Oakland Park) and unincorporated Broward County. Both the Fort Lauderdale-Hollywood International Airport and Port Everglades are also located near the I-95 and I-595 interchange. Improvements to the I-95 corridor are needed in order to:

- Provide new and enhanced mobility options for motorists and transit users
- Enhance mobility of goods and services to support the freight network
- Improve emergency evacuation
- Support economic development

The study seeks to enhance operational capacity and relieve congestion along the I-95 corridor by converting the existing High Occupancy Vehicle (HOV) lane to a tolled Express Lane and adding one additional tolled Express Lane to the median of I-95, in each direction.

This also provides for the opportunity to incorporate regional express bus service. The Express Lanes will have variable toll pricing based on congestion to optimize traffic flow.

Summary of Design Variations and Exceptions

The geometry of the roadway was analyzed to determine compliance with the FDOT Plans Preparation Manual and with the criteria set forth in the American Association of State Highway Transportation Officials (AASHTO) Manual. The following 13 controlling design elements were analyzed:

1. Design Speed
2. Lane Widths
3. Shoulder Widths
4. Bridge Widths
5. Structural Capacity
6. Vertical Clearance
7. Grades
8. Cross Slope
9. Superelevation
10. Horizontal Alignment
11. Vertical Alignment
12. Stopping Sight Distance
13. Horizontal Clearance

In addition to the 13 controlling elements, the border width was also reviewed for compliance with the FDOT PPM criteria. Table 1 summarizes the design exceptions and variations required for the project.

Table 1
Design Variations and Exceptions Summary

Design Compliance	Design Element	Location / Description
Design Exceptions	Lane Width	11-ft. Express lanes throughout the project and one 11-ft. general purpose lane at the constrained locations.
	Shoulder Width	The shoulder width varies at the following locations (see Table 2): -SW 42 Street -SR 84 -South Fork New River -Davie Boulevard (SR 736) -NB at Park and Ride Ramp south of Broward Boulevard -North Woodlawn Cemetery -Sunrise Boulevard (SR 838)
Design Variations	Horizontal Clearance	Two existing light poles on breakaway supports are located approximately 8 ft. from the auxiliary lane in the vicinity of the North Woodlawn Cemetery.
	Bridge Width	Bridge No. 860430 and Bridge No. 860431 over the South Fork New River
	Vertical Clearance	I-595 EB over I-95 NB measures 16.43 I-595 WB over I-95 NB measures 16.43 WB I-595 to SB I-95 over I-95 measures 16.33 PNR #2 to I-95 ramp over I-95 SB measures 16.02 Sunrise Boulevard (SR 838) over I-95 measures 16.41 I-95 over Griffin Road (SR 818) measures 16.10 I-95 over NW 6 Street measures 16.35 I-95 over NW 19th Street measures 14.78 ft. (see notes) I-95 over Oakland Park Boulevard (SR 816) measures 15.05 ft. (Refer to Table 3)
	Horizontal Alignment	Nine curves do not meet the minimum length requirement as per PPM
	Vertical Alignment	Eight curves do not meet the minimum K-Value requirement. Two sag curves and 7 crest curves do not meet the minimum length requirement.
	Stopping Sight Distance	Six curves do not meet the minimum stopping sight distance requirement.
	Shoulder Width	From I-595 to to North of the Broward Boulevard Park and Ride Ramp (M.P. 10.585) the inside shoulders vary from 10-ft to 12 ft.
	Border Width	Border width varies throughout the corridor from 9 ft. to 178 ft.

Notes: In accordance with the Value Engineering recommendations for this study, the I-95 bridge over NW 19th Street should be evaluated further during final design for possible widening solutions in lieu of replacement options. The vertical clearance should be re-evaluated at that time based on the solutions proposed.

1. Design Speed and Posted Speed

A review of existing plans provided by the FDOT indicated that the design speed for the study corridor has varied from 60 mph for the original design to 70 mph for subsequent resurfacing projects. The existing posted speed for the corridor is 65 mph. A speed study performed by FDOT in 2011 determined that a design speed of 65 mph is appropriate for this corridor.

2. Lane Widths

Lane widths for the corridor will vary per segment. From Stirling Road (SR 848) to I-595 and from north of the Broward Boulevard Park and Ride to Oakland Park Boulevard (SR 816) the Express Lanes and the general purpose lanes will be 12 ft.

From I-595 to north of the Broward Boulevard Park and Ride ramp, the Express Lanes will be 11 ft. In addition, there will be one 11 ft. general purpose lane in each direction at the constrained locations where the typical section is reduced. **As a result, a design exception for lane width is required under the proposed alternative. Refer to Attachment B for typical sections.**

3. Shoulder Widths

Shoulder widths for the corridor will also vary per segment. From Stirling Road (SR 848) to I-595 and from north of the Broward Boulevard Park and Ride ramp to Oakland Park Boulevard (SR 816), both inside and outside shoulders will be 12 ft. wide.

From I-595 to north of the Broward Boulevard Park and Ride ramp, the shoulder will vary in width. Generally, the inside shoulders will be 10 ft. wide and the outside shoulders will be 12 ft. wide. However, the typical section will be further reduced at several constrained locations. The constrained sections are described in the Table below.

Table 2
Typical Sections at Constrained Locations

Location	Direction	Shoulder Width		Auxiliary Lane (ft.)	Number of General Purpose Lanes	Total Width (ft.)	Length of Reduced Section (ft.)
		Outside (ft.)	Inside (ft.)				
SW 42 Street Underpass	SB	8	3	12	4	94	1840
	NB	8	3	12	4	94	1650
SR 84 Underpass	SB	8	8	0	3	76	8000*
	NB	9	8	0	3	76	6300**
South Fork New River Bridge	SB	8	4	0	3	72	8000*
	NB	8	3	24	3	94	6300**
Davie Boulevard (SR 736) Underpass	SB	8	3	12	3	88	8000*
	NB	11	11	15	3	122	Not constrained
Park and Ride Ramp south of Broward Boulevard (SR 842)	SB	10	10	24	3	103	Not constrained
	NB	11	7	12	4	102	1200
North Woodlawn Cemetery	SB	12	5	0	4	88	2200***
	NB	6	5	24	4	106	1900****
Sunrise Boulevard (SR 838) Underpass	SB	15	5	0	4	94	2200***
	NB	8	3	12	4	94	1900****

*Southbound SR 84, South Fork New River, and Davie Boulevard are one continuous constrained section for 8000 ft.
**Northbound SR 84 and South Fork New River are one continuous constrained section for 6300 ft.
***Southbound North Woodlawn Cemetery and Sunrise Boulevard are one continuous constrained section for 2000 ft.
****Northbound North Woodlawn Cemetery and Sunrise Boulevard are one continuous constrained section for 2000 ft.

Providing a 12 ft. outside shoulder at Sunrise Boulevard (SR 838) would result in a shift of the edge of pavement toward the west. This would require widening I-95 toward the outside and the transition would extend into the constrained section at the North Woodlawn Cemetery. Consequently, the 15 ft. outside shoulder at Sunrise Boulevard (SR 838) cannot be reduced in order to provide additional width for the inside shoulder.

A design exception for shoulder width is required under the proposed alternative.

4. Bridge Widths

The bridges along the project corridor are being widened and will provide adequate lane and shoulder widths except for the bridges over the South Fork New River. The bridges over Stirling Road were widened as part of I-95 Express Phase 2 project. The proposed improvements will tie into the Phase 2 construction at Stirling Road. Therefore, the current widths will be maintained and no further action is required. The inside shoulder widths on the northbound and southbound bridges over the South Fork New River are reduced to 3 ft. and 4 ft., respectively. The outside shoulders at these bridges are reduced to 8-ft in both directions. These bridges are part of the constrained section from SR 84 to Davie Boulevard (SR 736), and as such, the approaching roadway width is maintained through the bridges. **A design variation for bridge width is required under the proposed alternative.**

5. Structural Capacity

The I-95 southbound bridge over the Dania Cut-Off Canal has a load rating of 0.90. The bridges over NW 19th Street have load ratings of 0.833 and are being proposed for replacement. However, a load rating analysis will be performed on all bridges to be widened or replaced and a final decision will be made after the analysis is completed. The bridges over NW 6th Street have load ratings of 0.952, however, as per the FDOT Bridge Load Rating Manual, a value over 0.95 may be rounded up to 1.0. All other I-95 bridges have load rating over 1.0. **However, a design variation will be required in case the refined analysis does not yield a satisfactory load rating.**

6. Cross Slope

The two inside lanes (the Express Lanes) will feature 2% cross slopes and will slope toward the median. The first two general purpose lanes (from the Express Lanes toward the outside) will slope at 2% toward the outside. The remaining lanes will slope at 3% toward the outside. No design variation or exception will be required.

7. Vertical Clearance

As per Table 2.10.1 of the FDOT PPM, the minimum vertical clearance allowed for roadway over roadway is 16.5 ft. Existing vertical clearances over I-95 were field verified and the minimum vertical clearance is not met at five locations. In addition, existing vertical clearances below I-95 were verified with existing plans. Widening of the bridges will not reduce the existing vertical clearances below I-95; however, three locations were identified that do not meet the minimum PPM vertical clearance, including one that does not meet AASHTO criteria. AASHTO, however, states that 14 ft. clearance is allowed in highly developed urban areas if an alternate route can be provided. Sunrise Boulevard, which goes over I-95, is located 2 miles from Oakland Park Boulevard and can serve as alternate route.

The deficient vertical clearances along the corridor are detailed in **Table 3**. **Under the proposed alternative, a design variation for vertical clearance is required.**

Table 3
Vertical Clearance Design Variations

Location	Minimum Vertical Clearance (ft.)	PPM (ft.)	AASHTO (ft.)	Variation / Exception
I-595 EB over I-95 NB	16.43	16.50	16.00	Variation
I-595 WB over I-95 NB	16.43	16.50	16.00	Variation
WB I-595 to SB I-95 over I-95	16.33	16.50	16.00	Variation
PNR #2 to I-95 ramp over I-95 SB	16.02	16.50	16.00	Variation
Sunrise Boulevard (SR 838) over I-95	16.41	16.50	16.00	Variation
I-95 over Griffin Road (SR 818)	16.10	16.50	16.00	Variation
I-95 over NW 6th Street	16.35	16.50	16.00	Variation
I-95 over NW 19th Street	14.78	16.50	16.00	Variation*
I-95 over Oakland Park Boulevard (SR 816)	15.05	16.50	16.00	Variation*

*14 feet allowed in highly developed urban areas if alternate route has 16 feet.

The bridges over NW 19th Street have load ratings of 0.833 and are being proposed for replacement. However, a load rating analysis will be performed on all bridges to be widened or replaced and a final decision will be made after the analysis is completed.

8. Superelevation

All horizontal curves along the corridor meet the required superelevation as per the FDOT PPM. No design variation or exception will be required.

9. Horizontal Alignment

Nine horizontal curves do not meet the minimum curve length as required by the FDOT PPM. **A design variation for horizontal alignment is proposed under the proposed alternative. Refer to Attachment B for geometric controls.**

10. Grade

All grades along the corridor are 3% or less, as required by the FDOT PPM. No design variation or design exception will be required under the proposed alternative.

11. Vertical Alignment

Eight curves do not meet the minimum K-Value required by the FDOT PPM. In addition, one sag curve and seven crest curves do not meet the minimum length required by the FDOT PPM. **Under the proposed alternative, a design variation for vertical alignment is required.**

12. Stopping Sight Distance

Six curves do not meet the minimum stopping sight distance required by the FDOT PPM. **Under the proposed alternative, a design variation for stopping sight distance is required.**

13. Horizontal Clearance

Two existing light poles in the vicinity of the North Woodlawn Cemetery are located approximately 8 ft. from the auxiliary lane. **A design variation for horizontal clearance is required** for the proposed alternative to avoid and minimize impacts to the cemetery resulting from the implementation of a barrier system.

Other: Border Width

The border width varies from 9 ft. to 178 ft. For the majority of the corridor, except at the interchanges, the border width is less than the 94 ft. required by the FDOT PPM. It is never less than the 8 ft. required by AASHTO**. A design variation for border width is required under the proposed alternative.**

Attachment A
EXCERPTS FROM PRELIMINARY ENGINEERING REPORT

Proposed Horizontal Alignment - Radius of Curvature and Superelevation								
Curve No.	Existing Curve Parameters					Criteria		Variations or Exceptions
	Baseline	Design Speed (mph)	Radius (ft.)	Superelevation	Length (ft.)	PPM	AASHTO	
H1	NB & SB	65	5779.600	0.033	1,078.07	0.033	0.033	OK
H2	NB & SB	65	5779.570	0.033	1,064.86	0.033	0.033	OK
H3	NB & SB	65	28647.890	0.020	2,003.86	NC	NC	OK
H4	NB & SB	65	5729.570	0.033	2,294.27	0.033	0.033	OK
H5	NB & SB	65	28648.13	0.020	2,333.52	NC	NC	OK
H6	NB & SB	65	11458.060	0.020	835.74	0.020	0.020	OK
H7	NB & SB	65	11458.690	0.030	682.30	0.020	0.020	OK
H8	NB & SB	65	22918.350	0.020	1,982.45	NC	NC	OK
H9	NB	65	22929.00	0.020	2,073.86	NC	NC	OK
H10	NB	65	23988.00	0.020	975.02	NC	NC	OK
H11	NB	65	10511.00	0.020	786.65	RC	RC	OK
H12	NB	65	10511.00	0.020	560.39	RC	RC	OK
H13	NB	65	11989.00	0.020	1,426.11	RC	RC	OK
H14	SB	65	15048.00	0.020	1,873.05	NC	NC	OK
H15	SB	Curves H15 and H16 combined with curve H14						
H16	SB							
H17	SB	65	9009.00	0.021	1,199.91	0.021	0.021	OK
H18	SB	65	4573.00	0.041	678.17	0.041	0.041	OK
H19	SB	65	5022.00	0.038	484.87	0.038	0.038	OK
H20	NB & SB	65	11459.560	0.020	7751.68	0.020	0.020	OK
H21	NB & SB	65	4583.660	0.047	2,053.46	0.041	0.041	OK
H22	NB & SB	65	5729.620	0.037	947.11	0.033	0.033	OK
H23	NB & SB	65	5729.590	0.039	946.90	0.033	0.033	OK

Proposed Horizontal Alignment – Horizontal Curve Length								
Curve No.	Existing Curve Parameters					PPM / AASTHO Criteria		Variations or Exceptions
	Baseline	Design Speed (mph)	Radius (ft.)	Superelevation	Length (ft.)	Desirable (ft.)	Minimum (ft.)	
H1	NB & SB	65	5779.600	0.030	1,078.07	1950	975	OK
H2	NB & SB	65	5779.570	0.030	1,064.86	1950	975	OK
H3	NB & SB	65	28647.890	0.020	2,003.86	1950	975	OK
H4	NB & SB	65	5729.570	0.032	2,294.27	1950	975	OK
H5	NB & SB	65	28648.13	0.020	2,333.52	1950	975	OK
H6	NB & SB	65	11458.060	0.020	835.74	1950	975	Variation
H7	NB & SB	65	11458.690	0.030	682.30	1950	975	Variation
H8	NB & SB	65	22918.350	0.020	1,982.45	1950	975	OK
H9	NB	65	22929.00	0.020	2,073.86	1950	975	OK
H10	NB	65	23988.00	0.020	975.02	1950	975	OK
H11	NB	65	10511.00	0.020	786.65	1950	975	Variation
H12	NB	65	10511.00	0.020	560.39	1950	975	Variation
H13	NB	65	11989.00	0.020	1,426.11	1950	975	OK
H14	SB	65	15048.00	0.020	1,873.05	1950	975	OK

Proposed Horizontal Alignment – Horizontal Curve Length								
Curve No.	Existing Curve Parameters					PPM / AASTHO Criteria		Variations or Exceptions
	Baseline	Design Speed (mph)	Radius (ft.)	Superelevation	Length (ft.)	Desirable (ft.)	Minimum (ft.)	
H15	SB	Curves H15 and H16 combined with curve H14						
H16	SB							
H17	SB	65	9009.00	0.021	1,199.91	1950	975	OK
H18	SB	65	4573.00	0.041	678.17	1950	975	Variation
H19	SB	65	5022.00	0.038	484.87	1950	975	Variation
H20	NB & SB	65	11459.560	0.020	751.68	1950	975	Variation
H21	NB & SB	65	4583.660	0.047	2,053.46	1950	975	OK
H22	NB & SB	65	5729.620	0.037	947.11	1950	975	Variation
H23	NB & SB	65	5729.590	0.039	946.90	1950	975	Variation

Proposed Horizontal Alignment – Horizontal Sight Distance								
Curve No.	Existing Curve Parameters					Criteria		Variations or Exceptions
	Baseline	Design Speed (mph)	Radius (ft.)	Horizontal Sightline Offset (ft.)	Sight Distance (ft.)	PPM (ft.)	AASHTO (ft.)	
H1	NB & SB	65	5779.600	16.50	874	730.00	645.00	OK
H2	NB & SB	65	5779.570	16.50	874	730.00	645.00	OK
H3	NB & SB	65	28647.890	11.50	1623	730.00	645.00	OK
H4	NB & SB	65	5729.570	16.50	870	730.00	645.00	OK
H5	NB & SB	65	28648.13	16.50	1945	730.00	645.00	OK
H6	NB & SB	65	11458.060	11.50	1027	730.00	645.00	OK
H7	NB & SB	65	11458.690	11.50	1027	730.00	645.00	OK
H8	NB & SB	65	22918.350	11.50	1452	730.00	645.00	OK
H9	NB	65	22929.00	11.50	1452	730.00	645.00	OK
H10	NB	65	23988.00	11.50	1452	730.00	645.00	OK
H11	NB	65	10511.00	16.50	1486	730.00	645.00	OK
H12	NB	65	10511.00	11.50	1178	730.00	645.00	OK
H13	NB	65	11989.00	16.50	983	730.00	645.00	OK
H14	SB	65	15048.00	16.50	1409	730.00	645.00	OK
H15	SB	65	Curves H15 and H16 combined with curve H14					
H16	SB	65						
H17	SB	65	9009.00	11.50	910	730.00	645.00	OK
H18	SB	65	4573.00	40.00	1210	730.00	645.00	OK
H19	SB	65	5022.00	42.00	1300	730.00	645.00	OK
H20	NB & SB	65	11459.560	16.50	1230	730.00	645.00	OK
H21	NB & SB	65	4583.660	16.50	778	730.00	645.00	OK
H22	NB & SB	65	5729.620	16.50	870	730.00	645.00	OK
H23	NB & SB	65	5729.590	16.50	870	730.00	645.00	OK

Vertical Alignment - Grades and K Values

Curve No.	Baseline	Design Speed (mph)	Vertical Curve Type	Grade		Δ G	Existing Curve Length (ft.)	Existing K-Value	Criteria- K Value		Variation or Exception
				Back	Ahead				PPM	AASHTO	
V1	NB & SB	65	Sag	Curve is outside of the project limits							
V2	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	401.00	193.00	Variation
V3	NB & SB	65	Sag	Sag curve to be brought up to PPM standards with overbuild							Variation
V4	SB	65	Sag	0.0000	2.5220	2.522	825.00	327.12	181.00	157.00	OK
V5	NB	65	Sag	0.0000	2.5220	2.522	800.00	317.21	181.00	157.00	OK
V6	NB & SB	65	Crest	2.522	2.434	4.956	1500.00	302.66	401.00	193.00	Variation
V7	NB & SB	65	Sag	Sag curve to be corrected with overbuild							
V8	NB & SB	65	Sag	0.000	1.500	1.500	600.00	400.00	181.00	157.00	OK
V9	NB & SB	65	Crest	1.500	0.500	2.000	640.00	320.00	401.00	193.00	Variation
V10	NB & SB	65	Sag	0.500	0.302	0.802	500.00	623.44	181.00	157.00	OK
V11	NB	65	Sag	0.3020	0.300	0.602	440.00	730.90	181.00	157.00	OK
V12	SB	65	Sag	0.302	0.300	0.602	500.00	830.56	181.00	157.00	OK
V13	NB	65	Crest	0.300	0.300	0.600	500.00	833.33	401.00	193.00	OK
V14	SB	65	Crest	0.300	0.300	0.600	500.00	833.33	401.00	193.00	OK
V15	NB & SB	65	Sag	0.300	0.300	0.600	500.00	833.33	181.00	157.00	OK
V16	NB & SB	65	Crest	0.300	0.300	0.600	500.00	833.33	401.00	193.00	OK
V17	NB & SB	65	Sag	0.300	3.000	3.300	778.00	235.76	181.00	157.00	OK
V18	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	401.00	193.00	Variation
V19	NB & SB	65	Sag	3.000	0.750	2.250	1000.00	266.67	181.00	157.00	OK
V20	NB & SB	65	Sag	0.750	0.400	1.150	1000.00	869.57	181.00	157.00	OK
V21	NB & SB	65	Crest	0.400	0.9	1.300	1000.00	769.23	401.00	193.00	OK
V22	NB & SB	65	Sag	0.9000	0.4200	1.320	800.00	606.06	181.00	157.00	OK
V23	SB	65	Crest	0.4200	0.3700	0.790	1000.00	1265.82	401.00	193.00	OK
V24	NB	65	Crest	0.420	0.300	0.720	1000.00	1388.70	401.00	193.00	OK
V25	NB	65	Sag	0.300	0.414	0.714	800.00	1120.45	181.00	157.00	OK
V26	SB	65	Sag	2.117	0.000	2.117	800.00	377.84	181.00	157.00	OK
V27	NB	65	Sag	2.137	0.000	2.117	800.00	374.36	181.00	157.00	OK
V28	SB	65	Sag	0.000	0.109	0.109	800.00	7332.72	181.00	157.00	OK
V29	NB	65	Sag	0.000	0.1040	0.104	800.00	7692.31	181.00	157.00	OK
V30	SB	65	Sag	0.1091	2.468	2.359	600.00	232.81	181.00	157.00	OK
V31	NB	65	Sag	0.104	2.503	2.399	600.00	230.16	181.00	157.00	OK
V32	SB	65	Crest	Curve to be reconstructed as part of the NW 19 Street bridge replacement							
V33	NB	65	Crest	Curve to be reconstructed as part of the NW 19 Street bridge replacement							
V34	SB	65	Sag	2.484	0.000	2.484	800.00	322.06	181.00	157.00	OK
V35	NB	65	Sag	2.496	0.000	2.496	800.00	320.46	181.00	157.00	OK
V36	SB	65	Sag	0.000	2.478	2.478	600.00	242.16	181.00	157.00	OK
V37	NB	65	Sag	0.000	2.515	2.515	600.00	238.60	181.00	157.00	OK
V38	SB	65	Crest	2.478	2.007	4.485	1170.00	260.86	401.00	193.00	Variation
V39	NB	65	Crest	2.515	2.023	4.538	1170.00	257.82	401.00	193.00	Variation

Vertical Alignment - Vertical Curve Length											
Curve No.	Baseline	Design Speed (mph)	Vertical Curve Type	Grade		Δ G	Existing Curve Length (ft.)	Existing K-Value	Criteria- Curve Length		Variation or Exception
				Back	Ahead				PPM	AASHTO	
V1	NB & SB	65	Sag	Curve is outside of the project limits							
V2	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	1800.00	1158.00	OK
V3	NB & SB	65	Sag	Sag curve to be brought up to PPM standards with overbuild							Variation
V4	SB	65	Sag	0.0000	2.5220	2.522	825.00	327.12	800.00	395.95	OK
V5	NB	65	Sag	0.0000	2.5220	2.522	800.00	317.21	800.00	395.95	OK
V6	NB & SB	65	Crest	2.522	2.434	4.956	1500.00	302.66	1800.00	956.51	Variation
V7	NB & SB	65	Sag	Sag curve to be corrected with overbuild							
V8	NB & SB	65	Sag	Sag curve to be corrected with overbuild							
V9	NB & SB	65	Crest	1.500	0.500	2.000	640.00	320.00	1000.00	386.00	Variation
V10	NB & SB	65	Sag	Sag curve to be corrected with overbuild							
V11	NB	65	Sag	Sag curve to be corrected with overbuild							
V12	SB	65	Sag	Sag curve to be corrected with overbuild							
V13	NB	65	Crest	0.300	0.300	0.600	500.00	833.33	1000.00	115.80	Variation
V14	SB	65	Crest	0.300	0.300	0.600	500.00	833.33	1000.00	115.80	Variation
V15	NB & SB	65	Sag	Sag curve to be corrected with overbuild							
V16	NB & SB	65	Crest	0.300	0.300	0.600	500.00	833.33	1000.00	115.80	Variation
V17	NB & SB	65	Sag	Sag curve to be corrected with overbuild							
V18	NB & SB	65	Crest	3.000	3.000	6.000	1800.00	300.00	1000.00	1158.00	OK
V19	NB & SB	65	Sag	3.000	0.750	2.250	1000.00	266.67	800.00	588.75	OK
V20	NB & SB	65	Sag	0.750	0.400	1.150	1000.00	869.57	800.00	180.55	OK
V21	NB & SB	65	Crest	0.400	0.9	1.300	1000.00	769.23	1000.00	250.90	OK
V22	NB & SB	65	Sag	0.9000	0.4200	1.320	800.00	606.06	800.00	207.24	OK
V23	SB	65	Crest	0.4200	0.3700	0.790	1000.00	1265.82	1000.00	152.47	OK
V24	NB	65	Crest	0.420	0.300	0.720	1000.00	1388.70	1000.00	138.98	OK
V25	NB	65	Sag	0.300	0.414	0.714	800.00	1120.45	800.00	112.10	OK
V26	SB	65	Sag	2.117	0.000	2.117	800.00	377.84	800.00	332.42	OK
V27	NB	65	Sag	2.137	0.000	2.117	800.00	374.36	800.00	335.51	OK
V28	SB	65	Sag	0.000	0.109	0.109	800.00	7332.72	800.00	17.13	OK
V29	NB	65	Sag	0.000	0.1040	0.104	800.00	7692.31	800.00	16.33	OK
V30	SB	65	Sag	Sag curve to be corrected with overbuild							
V31	NB	65	Sag	Sag curve to be corrected with overbuild							
V32	SB	65	Crest	Curve to be reconstructed as part of the NW 19 Street bridge replacement							
V33	NB	65	Crest	Curve to be reconstructed as part of the NW 19 Street bridge replacement							
V34	SB	65	Sag	2.484	0.000	2.484	800.00	322.06	800.00	389.99	OK
V35	NB	65	Sag	2.496	0.000	2.496	800.00	320.46	800.00	391.93	OK
V36	SB	65	Sag	Sag curve to be corrected with overbuild							
V37	NB	65	Sag	Sag curve to be corrected with overbuild							
V38	SB	65	Crest	2.478	2.007	4.485	1170.00	260.86	1800.00	865.62	Variation
V39	NB	65	Crest	2.515	2.023	4.538	1170.00	257.82	1800.00	875.85	Variation

Vertical Alignment- Vertical Stopping Sight Distance

Curve No.	Baseline	Vertical Curve Type	Grade		Δ G	Existing Curve Length (ft.)	Existing SSD		Criteria - SSD		Variation or Exception
			Back	Ahead			PPM	AASHTO	PPM	AASHTO	
V2	NB & SB	Crest	3.000	3.000	6.000	1800.00	631.46	804.67	730.00	645.00	Variation
V6	NB & SB	Crest	2.522	2.434	4.956	1500.00	634.26	808.23	730.00	645.00	Variation
V9	NB & SB	Crest	1.500	0.500	2.000	640.00	652.17	831.06	730.00	645.00	Variation
V13	NB	Crest	0.300	0.300	0.600	500.00	1052.44	1341.11	730.00	645.00	OK
V14	SB	Crest	0.300	0.300	0.600	500.00	1052.44	1341.11	730.00	645.00	OK
V16	NB & SB	Crest	0.300	0.300	0.600	500.00	1052.44	1341.11	730.00	645.00	OK
V18	NB & SB	Crest	3.000	3.000	6.000	1800.00	631.46	804.67	730.00	645.00	Variation
V21	NB & SB	Crest	0.400	0.9	1.300	1000.00	1011.15	1288.50	730.00	645.00	OK
V23	SB	Crest	0.4200	0.3700	0.790	1000.00	1297.10	1652.88	730.00	645.00	OK
V24	NB	Crest	0.420	0.300	0.720	1000.00	1358.60	1731.25	730.00	645.00	OK
V32	SB	Crest	Curve to be reconstructed as part of the NW 19 Street bridge replacement								
V33	NB	Crest	Curve to be reconstructed as part of the NW 19 Street bridge replacement								
V38	SB	Crest	2.478	2.007	4.485	1170.00	588.84	750.35	730.00	645.00	Variation
V39	NB	Crest	2.515	2.023	4.538	1170.00	585.39	745.95	730.00	645.00	Variation

Existing Bridge Characteristics																	
#	Location	Bridge Numbers	Minimum Vertical Clearance (ft.)	Superstructure Type	Substructure Type	Average Bridge Width (ft.)	Bridge Length (ft.)	No. of Spans	Max Span Length (ft.)	Load Rating	Sufficiency Rating	Health Index	Bridge Railings	Substructure	Restriction	Deficiency	Year Built / Reconst.
1	I-95 over Stirling Road (SR 848)	860579 (SB)	16.25**	AASHTO Type IV	Pier/Bents 18" Prest. Piles	85.7/ 85.7	178.0	2	89.0	HS 20 (RF>1)	98.0	99.82	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
2		860580 (NB)								HS 20 (RF>1)	98.0	99.99	Meets Standard	Very Good	Open, no restriction	Not deficient	
3	I-95 over Griffin Road (SR 818)	860554 (SB)	16.10	AASHTO Type IV	Pier/Bents 18" Prest. Piles	85.7/ 85.7	180.0	2	90.0	HS 20 (RF>1)	96.0	99.54	Meets Standard	Satisfactory	Open, no restriction	Not deficient	1990
4		860555 (NB)								HS 20 (RF>1)	93.0	99.62	Meets Standard	Satisfactory	Open, no restriction	Not deficient	1989
5	I-95 over Dania Cut-off Canal	860109 (SB)	11.35 (MHW)	AASHTO Type III	Pier/Bents 18" Prest. Piles	96.54/ 96.54	180.2	3	80.2	HL 93 (IRF<1) 0.90	85.0	99.30	Meets Standard	Satisfactory	Open, no restriction	Not deficient	1965/ 1989
6		860209 (NB)								HS 20 (RF>1)	85.0	96.93	Meets Standard	Good	Open, no restriction	Not deficient	
7	SB I-95 to Griffin Road (SR 818) over Dania Cut off Canal	860546	11.65 (MHW)	AASHTO Type III	Pier/Bents 18" Prest. Piles	42.8	180.3	3	80.2	HS 20 (RF>1)	98.6	92.1	Meets Standard	Good	Open, no restriction	Not deficient	1988
8	SW 42 St over I-95/RR	860548	23.0 (RR)	Steel Plate Girders with Haunches	Pier/Bents 18" Prest. Piles	38.8	367.1	2	202.0	HS 20 (RF>1)	91.8	94.59	Meets Standard	Very Good	Open, no restriction	Functionally Obsolete	1989
9	I-595 over I-95/RR/ Ravenswood Road	860535 (WB)	16.43(NB)/ 16.66(SB)/ 23.55(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	58.8	1197.4	10	132.0	HS 20 (RF>1)	91.8	94.59	Meets Standard	Good	Open, no restriction	Not deficient	1989
10		860536 (EB)	16.43(NB)/ 17.00(SB)/ 23.55(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles					HS 20 (RF>1)	83.0	99.90	Meets Standard	Good	Open, no restriction	Not deficient	1989
11	SB I-95 to WB I-595 over Ravenswood Road	860537	24.32/ 23.01(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	42.8	695.0	5	213.0	HS 20 (RF>1)	97.8	99.46	Meets Standard	Good	Open, no restriction	Not deficient	1989
12	EB I-595 to NB I-95	860538	16.76/65.18 (RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	42.8	3749.7	22	210.8	HS 20 (RF>1)	82.6	90.84	Meets Standard	Good	Open, no restriction	Not deficient	1990
13	WB I-595 to SB I-95 over I-95	860539	16.44	Steel Box Girders	Pier/Bents 18" Prest. Piles	42.8	769.8	5	183.3	HS 20 (RF>1)	96.8	99.93	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
14	EB I-595 to SB I-95 over Ramp	860540	21.67/ 23.40 (RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	42.8	820.3	6	184.0	HS 20 (RF>1)	96.8	96.57	Meets Standard	Good	Open, no restriction	Not deficient	1988
15	NB I-95 to WB I-595 over I-95	860541	16.87/32.35 (RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	42.8	1639.0	10	206.3	HS 20 (IRF>1)	80.1	90.89	Meets Standard	Good	Open, no restriction	Not deficient	1990
16	SB I-95 to EB I-595	860542	16.50	Steel Box Girders	Pier/Bents 18" Prest. Piles	42.8	1965.0	12	203.8	HS 20 (RF>1)	84.9	92.48	Meets Standard	Good	Open, no restriction	Not deficient	1990
17	SB I-95 to Griffin Road (SR-818)	860547	N/A	Steel Box Girders	Pier/Bents 18" Prest. Piles	29.7	389.7	3	184.1	HS 20 (RF>1)	97.7	98.92	Meets Standard	Very Good	Open, no restriction	Not deficient	1988
18	EB SR 84 to SB I-95 over CSX	860521	21.14/ 23.17(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	29.8	272.0	3	120.0	HS 20 (RF>1)	97.6	99.76	Meets Standard	Very Good	Open, no restriction	Not deficient	1989
19	WB SR 84 over RR	860522	21.0/ 23.08(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	77.8	280.0	3	120.0	HS 20 (RF>1)	96.3	99.74	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
20	WB SR 84 over I-95	860523	17.22	Steel Box Girders	Pier/Bents 18" Prest. Piles	71.3	175.0	1	175.0	HS 20 (RF>1)	93.1	99.83	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
21	WB SR 84 over I-595 ramps to NB I-595	860524	16.36	Steel Box Girders	Pier/Bents 18" Prest. Piles	77.3	297.8	2	161.8	HS 20 (RF>1)	95.0	75.95	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
22	NB I-95 to EB SR 84	860525	16.36	Steel Box Girders	Pier/Bents 18" Prest. Piles	29.8	302.3	2	164.3	HS 20 (RF>1)	95.1	98.26	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
23	SB I-95 to EB SR 84	860526	N/A	Steel Box Girders	Pier/Bents 18" Prest. Piles	38.8	623.6	5	130.0	HS 20 (RF>1)	95.5	98.95	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
24	EB SR 84 to NB I-95	860527	N/A	Steel Box Girders	Pier/Bents 18" Prest. Piles	38.8	625.7	5	132.0	HS 20 (RF>1)	96.8	99.24	Meets Standard	Very Good	Open, no restriction	Not deficient	1990
25	EB SR 84 over I-95/RR/Ramps	860528	17.96	AASHTO Type IV/ Steel Box Girders	Pier/Bents 18" Prest. Piles	68.3	1584.0	13	192.0	HS 20 (RF>1)	93.0	85.21	Meets Standard	Good	Open, no restriction	Not deficient	1988
26	I-595 to I-95 NB over South Fork New River	860213	55.1	AASHTO/PT Haunch Girders	Pier/Bents 18" Prest. Piles	47.3	1509.8	15	150.0	HS 20 (RF>1)	65.0	85.84	Substandard	Good	Open, no restriction	Not deficient	1969

Existing Bridge Characteristics

#	Location	Bridge Numbers	Minimum Vertical Clearance (ft.)	Superstructure Type	Substructure Type	Average Bridge Width (ft.)	Bridge Length (ft.)	No. of Spans	Max Span Length (ft.)	Load Rating	Sufficiency Rating	Health Index	Bridge Railings	Substructure	Restriction	Deficiency	Year Built / Reconst.
27	I-95 SB to I-595 over South Fork New River	860429	55.1	AASHTO Girders	Pier/Bents 18" Prest. Piles	54.8	1945.0	11	300.0	HS 20 (RF>1)	89.9	83.13	Meets Standard	Good	Open, no restriction	Not deficient	1987
28	I-95 over South Fork New River	860430 (SB)	55.1	Steel Plate Girders with Haunches	Pier/Bents 18" Prest. Piles	72.6	1945.0	11	300.0	HS 20 (RF>1)	85.0	97.23	Meets Standard	*	Open, no restriction	Not deficient	1988
29		860431 (NB)								HS 20 (RF>1)	91.0	82.99	Meets Standard	Good	Open, no restriction	Not deficient	1988
30	Davie Boulevard over I-95	860603	16.53	Steel Box Girders	Pier/Bents 18" Prest. Piles	141.2	979.0	8	136.0	HS 20 (RF>1)	84.7	99.98	Meets Standard	Good	Open, no restriction	Not deficient	1994
31	SB I-95 Off-ramp to Davie Boulevard	860604	N/A	Steel Box Girders	Pier/Bents 18" Prest. Piles	48.0	101.0	1	99.0	HS 20 (RF>1)	97.6	99.83	Meets Standard	Very Good	Open, no restriction	Not deficient	1993
32	NB I-95 Off-ramp to Davie Boulevard	860605	N/A	Steel Box Girders	Pier/Bents 18" Prest. Piles	52.8	101.0	1	99.0	HS 20 (RF>1)	95.2	99.83	Meets Standard	Very Good	Open, no restriction	Not deficient	1994
33	Broward Boulevard (SR 842) to SB I-95 over I-95 SB ramp to I-595	860606	16.50	Steel Box Girders	Pier/Bents 18" Prest. Piles	29.8	631.5	3	263.5	HS 20 (RF>1)	97.2	98.59	Meets Standard	Good	Open, no restriction	Not deficient	1994
34	NB I-95 to Broward Boulevard (SR 842) over I-595 ramp to NB I-95	860607	16.50	Steel Box Girders	Pier/Bents 18" Prest. Piles	29.8	527.5	3	219.5	HS 20 (RF>1)	97.5	99.48	Meets Standard	*	Open, no restriction	Not deficient	1994
35	WB Broward Boulevard (SR 842) over PNR Access	860257	23.50	AASHTO Girders	Pier/Bents 18" Prest. Piles	68.1	222.0	4	74.6	HS 20 (RF>1)	78.8	97.81	Substandard (Programmed to be replaced)	Satisfactory	Open, no restriction	Not deficient	1974
36	EB Broward Boulevard (SR 842) over PNR Access	860258	23.50	AASHTO Girders	Pier/Bents 18" Prest. Piles	68.1	222.0	3	107.6	HS 20 (RF>1)	78.8	98.46	Substandard (Programmed to be replaced)	Very Good	Open, no restriction	Not deficient	1974
37	Broward Boulevard (SR 842) over I-95	860269	16.50	AASHTO Girders	Pier/Bents 18" Prest. Piles	112.1	298.1	4	112.2	HS 20 (RF>1)	88.7	99.66	Substandard (Programmed to be replaced)	Good	Open, no restriction	Not deficient	1974
38	EB Broward Boulevard (SR 842) to NB I-95 Flyover	860598	16.69/ 29.95(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	31.1	1458.5	9	210.0	HS 20 (RF>1)	99.8	99.93	Meets Standard	Good	Open, no restriction	Not deficient	1994
39	PNR #2 to I-95 ramp over SB I-95 and SB I-95/I-595 Conn.	860600	16.02(SB)/ 16.91/ 25.59(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	31.1	1305.0	7	275.0	HS 20 (RF>1)	98.5	99.92	Meets Standard	Very Good	Open, no restriction	Not deficient	1995
40	PNR #2 to I-95 ramp over SB I-95 and SB I-95/I-595 Conn.	860638	16.91/ 25.59(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	31.1	1305.0	7	275.0	HS 20 (RF>1)	98.5	99.92	Meets Standard	Very Good	Open, no restriction	Not deficient	1995
41	I-95 to PNR #1 over I-95 SB/Broward Boulevard (SR 842)	860601	16.98/ 24.83(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	31.1	1275.0	9	250.0	HS 20 (RF>1)	97.9	78.85	Meets Standard	Good	Open, no restriction	Not deficient	1994
42	PNR to I-95 NB over I-95 SB/Broward Boulevard (SR 842)	860628	16.98/ 24.83(RR)	Steel Box Girders	Pier/Bents 18" Prest. Piles	31.1	1275.0	9	250.0	HS 20 (RF>1)	97.9	79.57	Meets Standard	Very Good	Open, no restriction	Functionally Obsolete	1994
43	SB I-95 to Broward Boulevard (SR 842) over North Fork New River	860260	6.89' ABOVE MHW	AASHTO Type II/ III	Pier/Bents 18"/20" Prest. Piles	48.3	155.0	3	65.0	HS 20 (RF>1)	96.7	88.96	Meets Standard	Very Good	Open, no restriction	Not deficient	1974/ 1994
44	I-95 over North Fork New River	860270 (SB)	7.55 Above MHW	AASHTO Type III	Pier/Bents 18"/20" Prest. Piles	89.2	207.0	5	69.0	HS 20 (RF>1)	85.0	86.85	Meets Standard	Good	Open, no restriction	Not deficient	1994
45		860271 (NB)	6.35 Above MHW	AASHTO Type II/ III		85.1	250.0	3	70.0	HS 20 (RF>1)	78.6	99.32	Meets Standard	Good	Open, no restriction	Not deficient	
46	Broward Boulevard (SR 842) to I-95 over North Fork New River	860602	7.29' ABOVE MHW	AASHTO Type III	Pile Bents/18" Prest. Piles	44.1	232.0	3	77.3	HS 20 (RF>1)	99.9	99.71	Meets Standard	Good	Open, no restriction	Not deficient	1993

Existing Bridge Characteristics

#	Location	Bridge Numbers	Minimum Vertical Clearance (ft.)	Superstructure Type	Substructure Type	Average Bridge Width (ft.)	Bridge Length (ft.)	No. of Spans	Max Span Length (ft.)	Load Rating	Sufficiency Rating	Health Index	Bridge Railings	Substructure	Restriction	Deficiency	Year Built / Reconst.
47	I-95 over NW 6 St	860272 (SB)	16.35	AASHTO Type II/ IV	Pier/Bents 18" Prest. Piles	97.08/ 109.08	158.6	3	83.1	HS 20 (IRF<1) 0.952	85.1	98.41	Meets Standard	Good	Open, no restriction	Not deficient	1994
48		860273 (NB)								HS 20 (IRF<1) 0.952	85.1	99.60	Meets Standard	Good	Open, no restriction	Not deficient	
49	Sunrise Boulevard (SR 838) over I-95	860126	16.41	AASHTO Girders	Pile Bents/18" Prest. Piles	141.4	531.1	8	99.6	HL 93 (IRF<1)	85.7	99.46	Meets Standard	Very Good	Open, no restriction	Not deficient	1974/ 1991
50	Sunrise Boulevard (SR 838) to I-95 SB	860263	N/A	AASHTO Girders	Piers/Bents/18" Prest. Piles	39.3	303.0	6	69.0	HS 20 (RF>1)	99.4	98.97	Meets Standard	Very Good	Open, no restriction	Not deficient	1974/ 1990
51	I-95 SB to Sunrise Boulevard (SR 838)	860264	N/A	AASHTO Girders	Piers/Bents/18" Prest. Piles	39.3	258.0	5	71.0	HS 20 (RF>1)	81.7	98.59	Meets Standard	Very Good	Open, no restriction	Functionally Obsolete	1975
52	I-95 over NW 19 St	860115	14.78	AASHTO Type II/ III	Pier/Bents 18" Prest. Piles	94.61/ 94.61	191.6	3	111.6	HS 20 (IRF<1) 0.833	87.2	99.16	Meets Standard	Good	Open, no restriction	Not deficient	1972/ 1990
53		860215								HS 20 (IRF<1) 0.833	88.2	99.15	Meets Standard	Good	Open, no restriction	Not deficient	
54	I-95 over C-13 Canal	860116	6' Above MHW	AASHTO Type II	Pier/Bents 18" Prest. Piles	94.61/ 94.61	109.0	3	36.3	HS 20 (RF>1)	87.7	95.50	Meets Standard	Good	Open, no restriction	Not deficient	1972/ 1990
55		860216								HS 20 (RF>1)	87.7	99.33	Meets Standard	Good	Open, no restriction	Not deficient	
56	I-95 over Oakland Park Boulevard (SR 816)	860117	15.05	AASHTO Type II/IV	Pier/Bents 18" Prest. Piles	94.61/ 94.61	253.8	4	83.3	HS 20 (RF>1)	83.0	99.96	Meets Standard	Good	Open, no restriction	Not deficient	1971/ 1990
57		860217								HS 20 (RF>1)	83.0	100.0	Meets Standard	Good	Open, no restriction	Not deficient	
58	Oakland Park Boulevard (SR 816) over C-13 Canal	860139	N/A	Prestressed Slab Units	Pile Bents/18" Prest. Piles	129.8	100.5	3	33.4	HS 20 (RF>1)	88.8	87.31	Meets Standard	Fair	Open, no restriction	Not deficient	1965/ 2004

Notes:

- NBI Bridge Condition; Deck, Superstructure & Substructure: Satisfactory to Very Good
- Load Rating RF>1 (Rating Factor greater than 1); IRF<1 (Inventory Rating Factor less than 1)
- Vertical Clearance: 1- Field Measured, 2- Previous Widening Project, 3- Existing Plans
- Vertical clearance values in red do not meet the FDOT PPM or AASHTO recommended minimum vertical clearance and are being impacted by the proposed improvements. A design variation is being requested for these values.
- * Information not available
- **The bridges over Stirling Road were widened as part of the I-95 Express Phase 2 project. The proposed improvements will tie into the Phase 2 construction at Stirling Road.

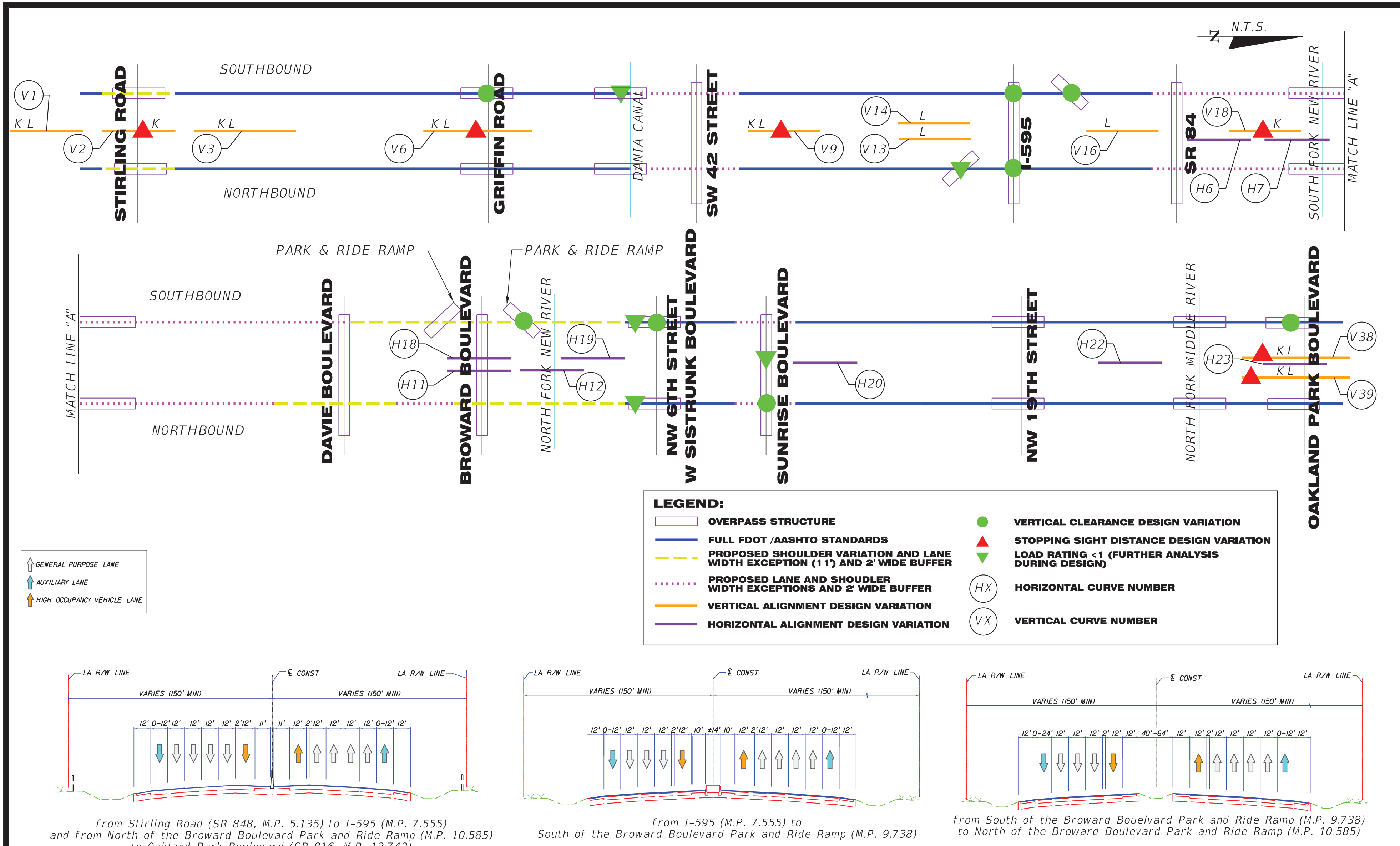
Definitions:

- Load Rating - indicates the live-load capacity of the bridge based on current conditions
- Sufficiency Rating - a measure used to determine whether a bridge that is structurally deficient or functionally obsolete should be repaired or just replaced
- Functionally Obsolete - refers to a bridge that does not meet current roadway design standards
- Health Index - a measure used to indicate overall conditions of a bridge. A Health Index below 85 generally indicates that some repairs are needed.

Proposed Bridge Characteristics – Proposed Alternative

#	Location	Bridge Numbers	Existing Bridge Width (ft.)	Proposed Bridge Width (ft.)	Min. Vert. Cl. (ft.)	Bridge Length (ft.)	Proposed Improvement
3	I-95 over Griffin Road (SR 818)	860554 (SB)	85625	100.875	16.10	180	Widening
4		860555 (NB)	85.625	100.875			Widening
5	I-95 over Dania Cut-off Canal	860109 (SB)	Varies from 88.208 to 91.177	96.75	11.33 (MHW)	180.3	Widening
6		860209 (NB)	96.625	112.75			Widening
43	SB I-95 to Broward Boulevard (SR 842) over North Fork New River	860260	51	Varies from 46.88 to 49.896	6.89 (MHW)	155	Widening
44	I-95 over North Fork New River	860270 (SB)	93.6	95.08	6.35 (MHW)	250	Widening
45		860271 (NB)	88.04	Varies from 94.08 to 97.042	7.55 (MHW)	207	
47	I-95 over NW 6 St	860272 (SB)	97.08	Varies from 219.33 to 224.00	16.35	158.6	Widening - bridges to be united
48		860273 (NB)	109.08				
52	I-95 over NW 19 St	860115	98.625	229.083	16.5	191.6	Replacement
53		860215	98.625				
54	I-95 over C-13 Canal	860116	Varies from 99.719 to 101.594	124.875	6 (MHW)	108	Widening
55		860216	98.708	112.875			Widening
56	I-95 over Oakland Park Boulevard (SR 816)	860117	94.61	112.875	15.05	253.8	Widening
57		860217	94.61	112.875			Widening

Attachment B
Typical Sections and Schematic Line Diagram

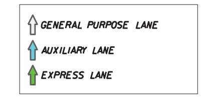


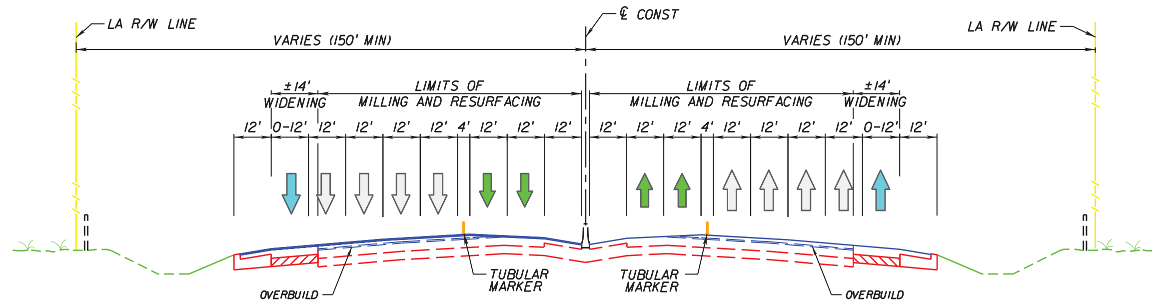
FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD COUNTY

I-95 (SR 9) PD&E STUDY
FPID: 429804-1-22-01

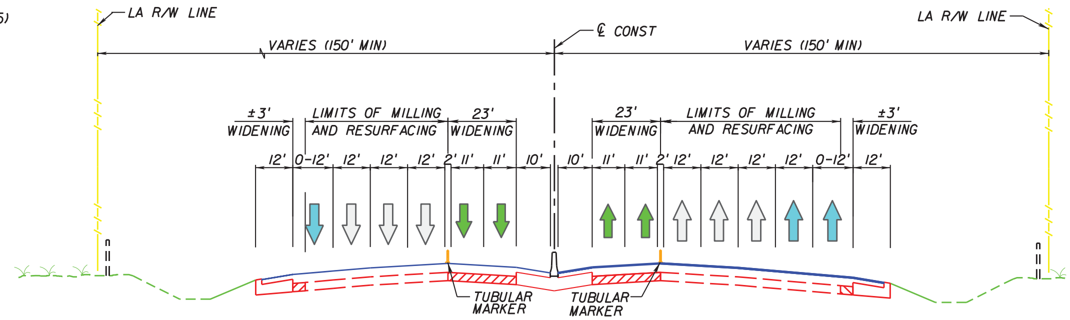
CONCEPT #3
SCHEMATIC LINE DIAGRAM

SHEET NO. B-2

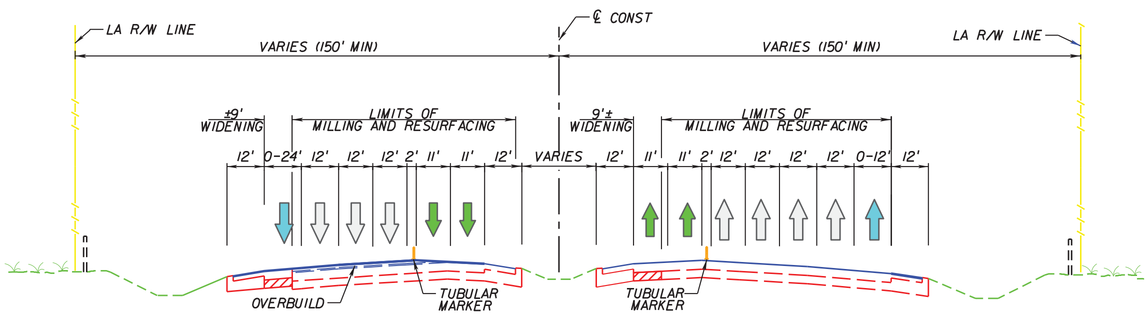




TYPICAL SECTION
from Stirling Road (SR 848, M.P. 5.135) to I-595 (M.P. 7.555)
and from North of the Broward Boulevard Park and Ride Ramp (M.P. 10.585)
to Oakland Park Boulevard (SR 816, M.P. 13.742)



TYPICAL SECTION
from I-595 (M.P. 7.555) to
South of the Broward Boulevard Park and Ride Ramp (M.P. 9.738)



TYPICAL SECTION
from South of the Broward Bouelvard Park and Ride Ramp (M.P. 9.738)
to North of the Broward Boulevard Park and Ride Ramp (M.P. 10.585)

FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD COUNTY

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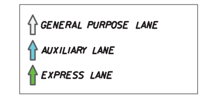
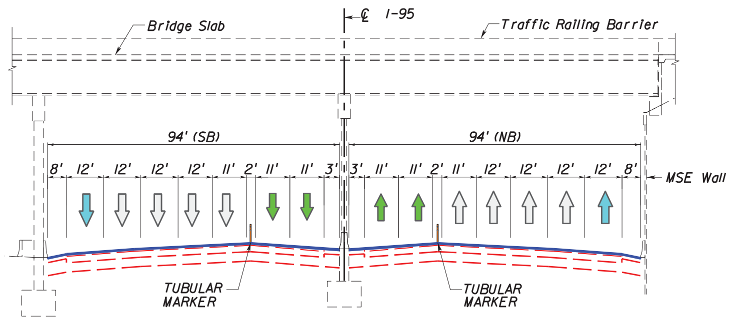
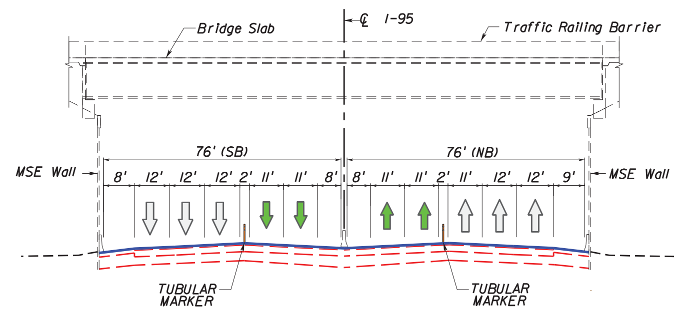
CONCEPT #3
TYPICAL SECTION EVALUATION

SHEET NO. B-3

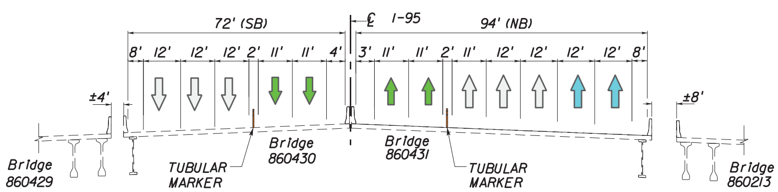




CONSTRAINED
TYPICAL SECTION
AT SW 42 STREET



CONSTRAINED
TYPICAL SECTION
AT SR 84



CONSTRAINED
TYPICAL SECTION
AT SOUTH FORK NEW RIVER

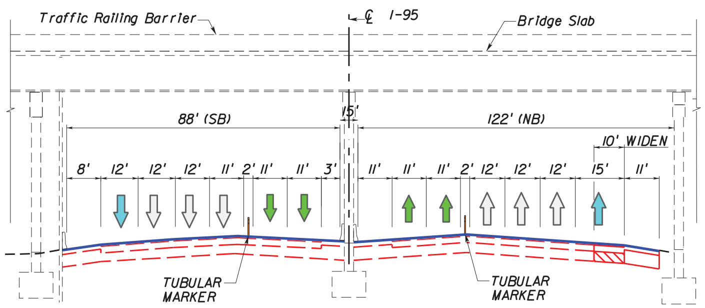
FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD COUNTY

I-95 (SR 9) PD&E STUDY
FPID: 429804-1-22-01

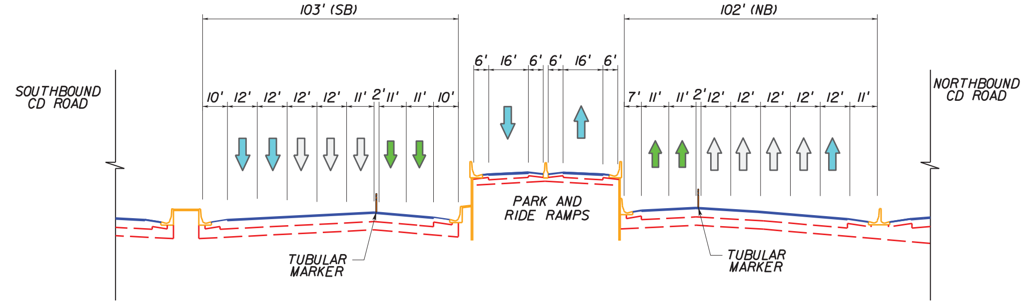
CONCEPT #3
TYPICAL SECTION EVALUATION

SHEET NO.
B-4

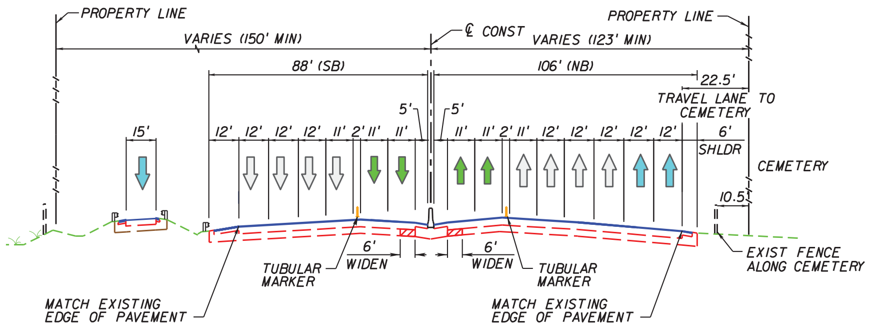
GENERAL PURPOSE LANE
AUXILIARY LANE
EXPRESS LANE



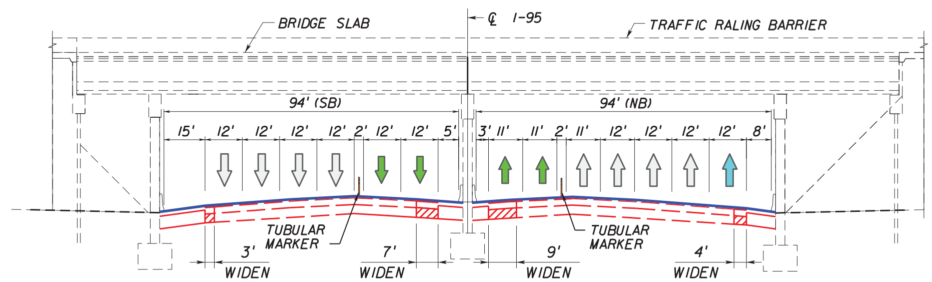
CONSTRAINED
TYPICAL SECTION
AT DAVIE BLVD. (SR 736)



CONSTRAINED
TYPICAL SECTION
AT PARK AND RIDE RAMP
SOUTH OF BROWARD BOULEVARD



CONSTRAINED
TYPICAL SECTION
BY NORTH WOODLAWN CEMETERY



CONSTRAINED
TYPICAL SECTION
AT SUNRISE BLVD. (SR 838)

FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD COUNTY

I-95 (SR 9) PD&E STUDY
FPID: 429804-1-22-01

CONCEPT #3
TYPICAL SECTION EVALUATION

SHEET NO.
B-5

APPENDIX D

Typical Section Package

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

LOCATION MAP

TYPICAL SECTION PACKAGE:

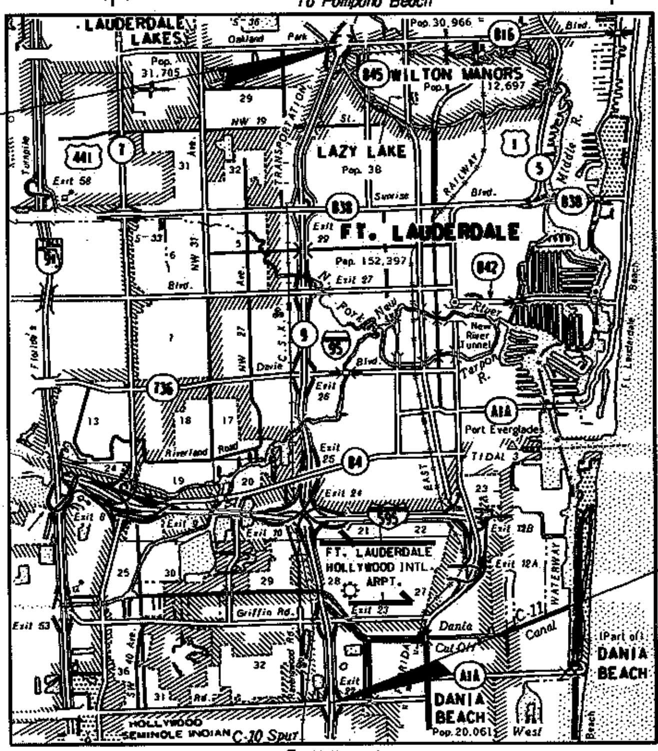
FINANCIAL PROJECT ID 429804-1-22-01
SR-9/I-95 PD&E STUDY
FROM SR 848/STIRLING ROAD
TO NORTH OF SR 816/OAKLAND PARK BOULEVARD
BROWARD COUNTY (87060000)

R-41-E | R-42-E   R-42-E | R-43-E

To Pompano Beach

END PROJECT
OAKLAND PARK BLVD.
MP 13.742

T-49-S / T-50-S



T-49-S / T-50-S

N

0 1 2
Miles

BEGIN PROJECT
STIRLING ROAD
MP 5.093

T-50-S / T-51-S   T-50-S / T-51-S

To Hollywood

R-41-E | R-42-E   R-42-E | R-43-E

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID 429804-1-22-01 COUNTY (SECTION) BROWARD (86070000)

PROJECT DESCRIPTION SR-9/I-95 PD&E STUDY FROM SR 848/STIRLING ROAD TO NORTH OF SR 816/OAKLAND PARK BOULEVARD

PROJECT CONTROLS

FUNCTIONAL CLASSIFICATION

( ) RURAL
(x) URBAN

(x)	FREEWAY/EXPWY.	( )	MAJOR COLL.
(x)	PRINCIPAL ART.	( )	MINOR COLL.
( )	MINOR ART.	( )	LOCAL

HIGHWAY SYSTEM

Yes	No	
(x)	( )	NATIONAL HIGHWAY SYSTEM
(x)	( )	STRATEGIC INTERMODIAL SYSTEM
(x)	( )	STATE HIGHWAY SYSTEM
( )	( )	OFF STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

(x) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

TRAFFIC

	YEAR	AADT
CURRENT	2011	278,300
OPENING	2020	295,000
DESIGN	2040	363,000

DESIGN SPEED 65
POSTED SPEED 65

DISTRIBUTION
K 8.0 %
D 50.0 %
T_{24} 6.5 %

DESIGN SPEED APPROVALS

Howard Webb, PE — DATE 6-7-13

Mark Plass, PE — DATE 6/10/13

CRITERIA

(x) NEW CONSTRUCTION / RECONSTRUCTION
( ) RRR INTERSTATE / FREEWAY
( ) RRR NON-INTERSTATE / FREEWAY
( ) TDLC / NEW CONSTRUCTION / RECONSTRUCTION
( ) TDLC / RRR
( ) MANUAL OF UNIFORM MINIMUM STANDARDS (FLORIDA GREENBOOK)(OFF-STATE HIGHWAY SYSTEM ONLY)

LIST ANY POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION ELEMENTS:

EXCEPTIONS: Lane Width and Shoulder Width.
VARIATIONS: Bridge Width, Shoulder Width, and Border Width.

LIST MAJOR STRUCTURES LOCATION/DESCRIPTION - REQUIRING INDEPENDENT STRUCTURE DESIGN:

BRIDGE NO.: 860554 & 860555 (Griffin Road), 860109 & 860209 (Dania Cut-Off Canal), 860260, 860270 & 860271 (North Fork New River), 860272 & 860273 (NW 6 St), 860115 & 860215 (NW 19 St), 860116 & 860216 (C-13 Canal), 860117 & 860217 (Oakland Park Boulevard)

LIST MAJOR UTILITIES WITHIN PROJECT CORRIDOR:

AT&T Florida	City of Oakland Park	FPL FiberNet
Broward County Water & Sewer Dept, ITS, and Traffic	Comcast	FPL Transmission
City of Dania Beach	Fiberlight LLC	Level 3 Communications
City of Fort lauderdale	Florida Gas Transmission	Time Warner Telecom
City of Hollywood	FPL Distribution	Verizon Business Solutions

LIST OTHER INFORMATION PERTINENT TO DESIGN OF PROJECT: The following segments are constrained due to existing features such as bridges piers, retaining walls, and cultural resources. Express lanes will be 11 ft. and one general purpose lane will be 11 ft. in each direction within these segments, unless otherwise noted. Inside shoulders vary from 3-8 ft., outside shoulders vary from 3-9 ft.

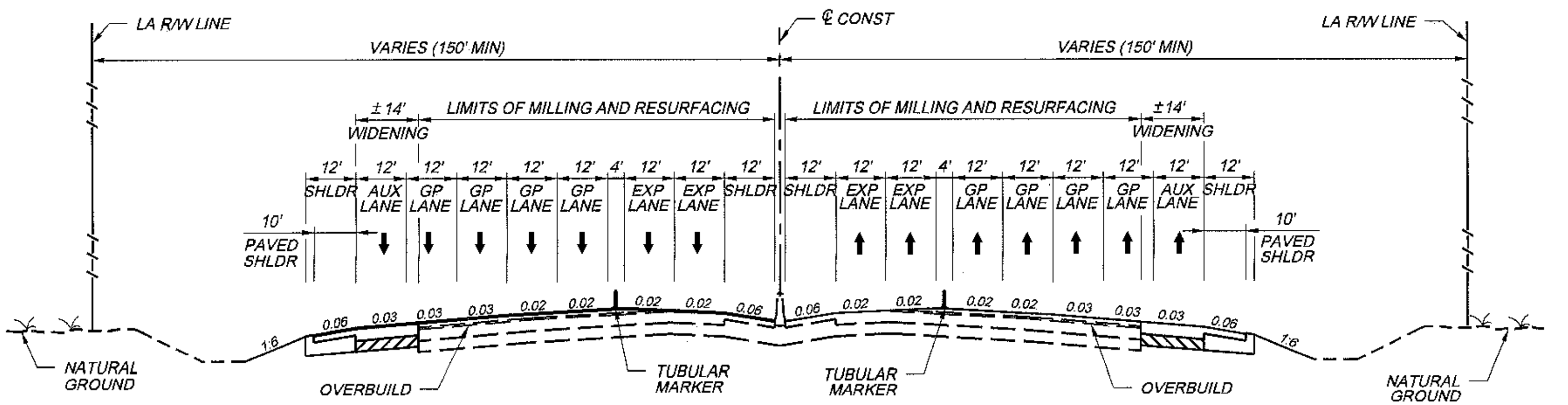
SW 42nd Street Underpass - STA. 1063+86 to STA. 1064+14
SR 84 Underpass - STA. 1130+40 to STA 1132+40
South Fork New River Bridge - STA. 1132+40 to STA. 1197+00
Southbound Davie Boulevard Underpass - STA. 1197+00 to STA. 1198+40
Northbound at Park and Ride Ramp south of Broward Boulevard - STA. 1224+00 to STA. 1233+00
North Woodlawn Cemetery - STA. 1298+75 to STA. 1305+75
Sunrise Boulevard Underpass - STA. 1305+75 to STA. 1307+25

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID	429804-1-22-01	FEDERAL AID PROJECT NO.	TBD	COUNTY NAME	BROWARD COUNTY
SECTION NO.	86070000	ROAD DESIGNATION	SR 9 / I-95	LIMITS/MILEPOST	M.P. 5.093 TO M.P. 13.742

PROJECT DESCRIPTION: SR 9/I-95 PD&E STUDY FROM SR 848/STIRLING ROAD TO NORTH OF SR 816/OAKLAND PARK BOULEVARD

PROPOSED ROADWAY TYPICAL SECTION



TYPICAL SECTION
FROM STIRLING ROAD (STA. 982+00 - MP 5.135)
TO I-595 (STA. 1109+77.60 - MP 7.555)
AND FROM NORTH OF BROWARD BOULEVARD
PARK & RIDE RAMP (STA. 1269+76.00 - MP 10.585)
TO OAKLAND PARK BLVD (STA. 1436+44.96 - MP 13.742)
DESIGN SPEED = 65 MPH

APPROVED BY	FDOT CONCURRENCE	RECOMMENDED BY	FHWA CONCURRENCE
[signature] 5/30/13 Date	[signature] 6-7-13 Date	[signature] 6/7/13 Date	Date
Silvia M. Beltre, PE No. 51295 Engineer of Record	Howard Webb, PE FDOT District IV Design Engineer	Richard Young, PE FDOT Project Development Engineer	Mark Clasgens, PE FHWA Transportation Engineer

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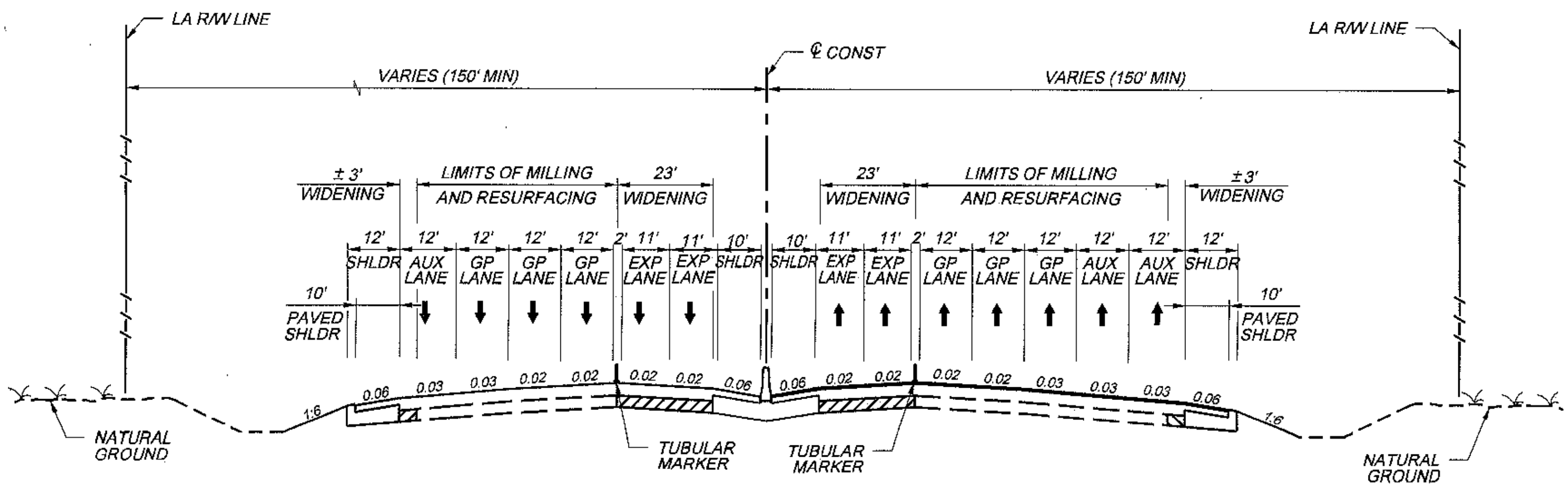
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID	429804-1-22-01	FEDERAL AID PROJECT NO.	TBD	COUNTY NAME	BROWARD COUNTY
SECTION NO.	86070000	ROAD DESIGNATION	SR 9 / I-95	LIMITS/MILEPOST	M.P. 5.093 TO M.P. 13.742

PROJECT DESCRIPTION: SR 9/I-95 PD&E STUDY FROM SR 848/STIRLING ROAD TO NORTH OF SR 816/OAKLAND PARK BOULEVARD

PROPOSED ROADWAY TYPICAL SECTION



TYPICAL SECTION
FROM I-595 (STA. 1109+77.60 - MP 7.555) TO
SOUTH OF THE BROWARD BOULEVARD
PARK & RIDE RAMP (STA. 1225+03.84 - MP 9.738)
DESIGN SPEED = 65 MPH

APPROVED BY	FDOT CONCURRENCE	RECOMMENDED BY	FHWA CONCURRENCE
5/30/13 Date	6-7-13 Date	6/7/13 Date	Date
Silvia M. Beltre, PE No. 51295 Engineer of Record	Howard Webb, PE FDOT District IV Design Engineer	Richard Young, PE FDOT Project Development Engineer	Mark Clasgens, PE FHWA Transportation Engineer

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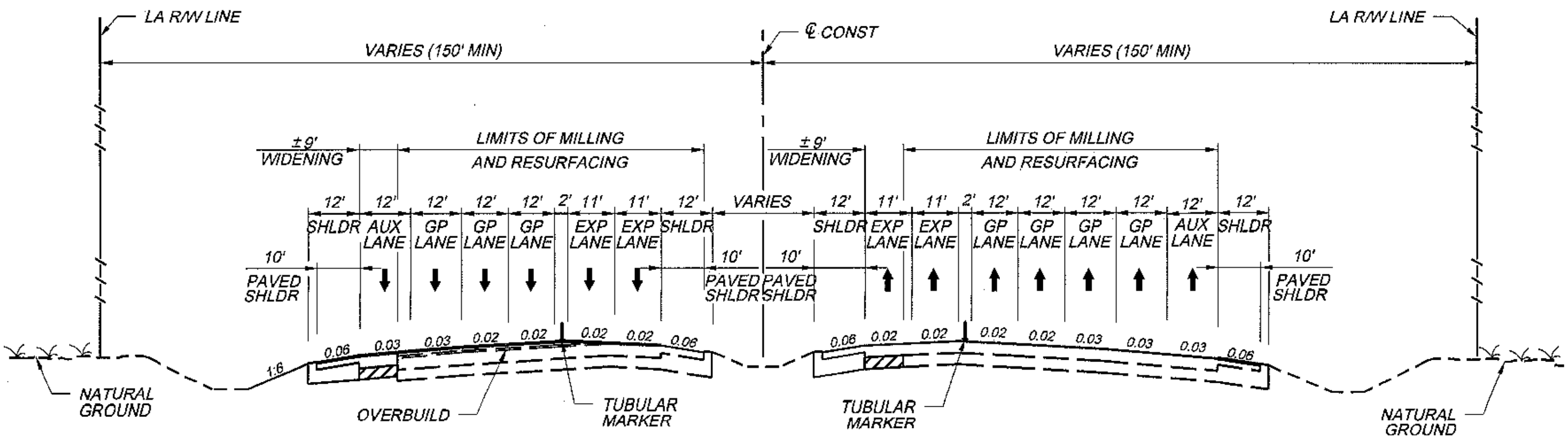
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID 429804-1-22-01 FEDERAL AID PROJECT NO. TBD COUNTY NAME BROWARD COUNTY

SECTION NO. 86070000 ROAD DESIGNATION SR 9 / I-95 LIMITS/MILEPOST M.P. 5.093 TO M.P. 13.742

PROJECT DESCRIPTION SR 9/I-95 PD&E STUDY FROM SR 848/STIRLING ROAD TO NORTH OF SR 816/OAKLAND PARK BOULEVARD

PROPOSED ROADWAY TYPICAL SECTION



TYPICAL SECTION
FROM SOUTH OF THE BROWARD BOULEVARD
PARK & RIDE RAMP (STA. 1225+03.84 - MP 9.738)
TO NORTH OF THE BROWARD BOULEVARD
PARK & RIDE RAMP (STA. 1269-76.00 - MP 10.585)
DESIGN SPEED = 65 MPH

APPROVED BY	FDOT CONCURRENCE	RECOMMENDED BY	FHWA CONCURRENCE
5/30/13 Date Silvia M. Beltre, PE No. 51295 Engineer of Record	6-7-13 Date Howard Webb, PE FDOT District IV Design Engineer	6/7/13 Date Richard Young, PE FDOT Project Development Engineer	Date Mark Clasgens, PE FHWA Transportation Engineer

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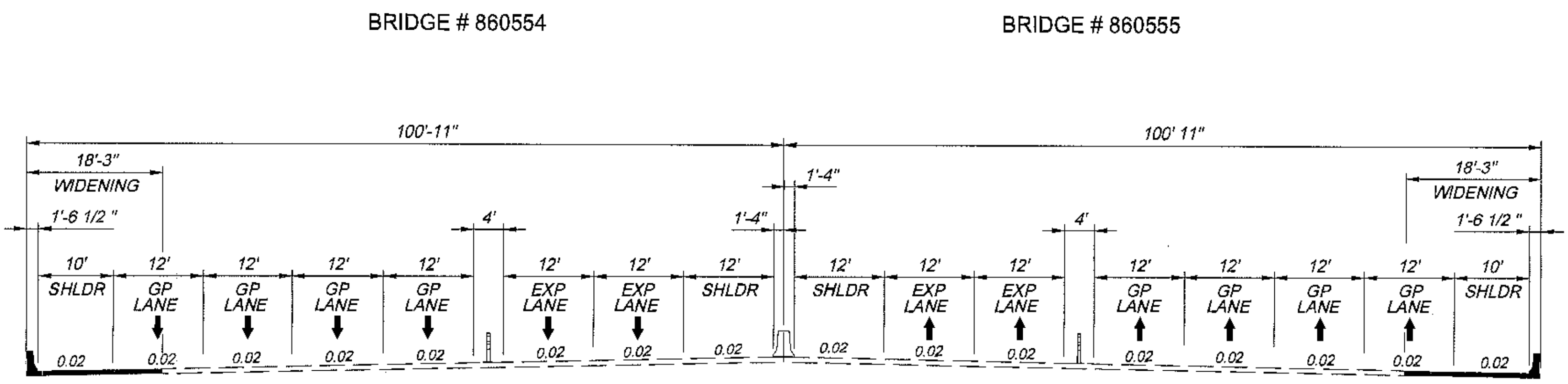
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID 429804-1-22-01 FEDERAL AID PROJECT NO. TBD COUNTY NAME BROWARD COUNTY

SECTION NO. 86070000 ROAD DESIGNATION SR 9 / I-95 LIMITS/MILEPOST M.P. 5.093 TO M.P. 13.742

PROJECT DESCRIPTION SR 9/I-95 PD&E STUDY FROM SR 848/STIRLING ROAD TO NORTH OF SR 816/OAKLAND PARK BOULEVARD

PROPOSED STRUCTURE TYPICAL SECTION



TYPICAL SECTION
I-95 BRIDGE OVER GRIFFIN ROAD
BRIDGE NO.: 860554 AND 860555
DESIGN SPEED = 65 MPH

APPROVED BY	FDOT CONCURRENCE	RECOMMENDED BY	FDOT CONCURRENCE
5/30/13 Date Silvia M. Beltre, PE No. 51295 Engineer of Record	6-7-13 Date Howard Webb, PE FDOT District IV Design Engineer	6/7/13 Date Richard Young, PE FDOT Project Development Engineer	6/10/13 Date Fred Ochoa, PE FDOT District IV Structures Design Engineer

FHWA CONCURRENCE

Mark Clasgens, PE Date
FHWA Transportation Engineer

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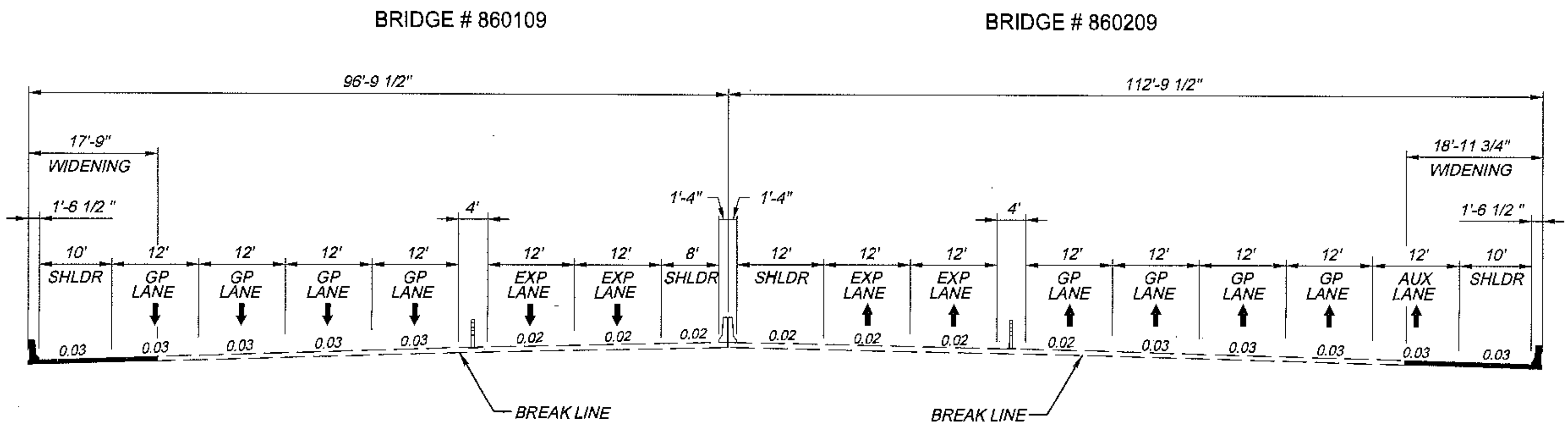
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID 429804-1-22-01 FEDERAL AID PROJECT NO. TBD COUNTY NAME BROWARD COUNTY

SECTION NO. 86070000 ROAD DESIGNATION SR 9 / I-95 LIMITS/MILEPOST M.P. 5.093 TO M.P. 13.742

PROJECT DESCRIPTION SR 9/I-95 PD&E STUDY FROM SR 848/STIRLING ROAD TO NORTH OF SR 816/OAKLAND PARK BOULEVARD

PROPOSED STRUCTURE TYPICAL SECTION



TYPICAL SECTION
I-95 BRIDGE OVER DANIA CUT-OFF CANAL
BRIDGE NO.: 860109 AND 860209
DESIGN SPEED = 65 MPH

FHWA CONCURRENCE

Mark Clasgens, PE
FHWA Transportation Engineer
Date

APPROVED BY	FDOT CONCURRENCE	RECOMMENDED BY	FDOT CONCURRENCE
[signature] 5/30/13 Silvia M. Beltre, PE No. 51295 Date Engineer of Record	[signature] 6-7-13 Howard Webb, PE Date FDOT District IV Design Engineer	[signature] 6/7/13 Richard Young, PE Date FDOT Project Development Engineer	[signature] 6/18/13 Fred Ochoa, PE Date FDOT District IV Structures Design Engineer

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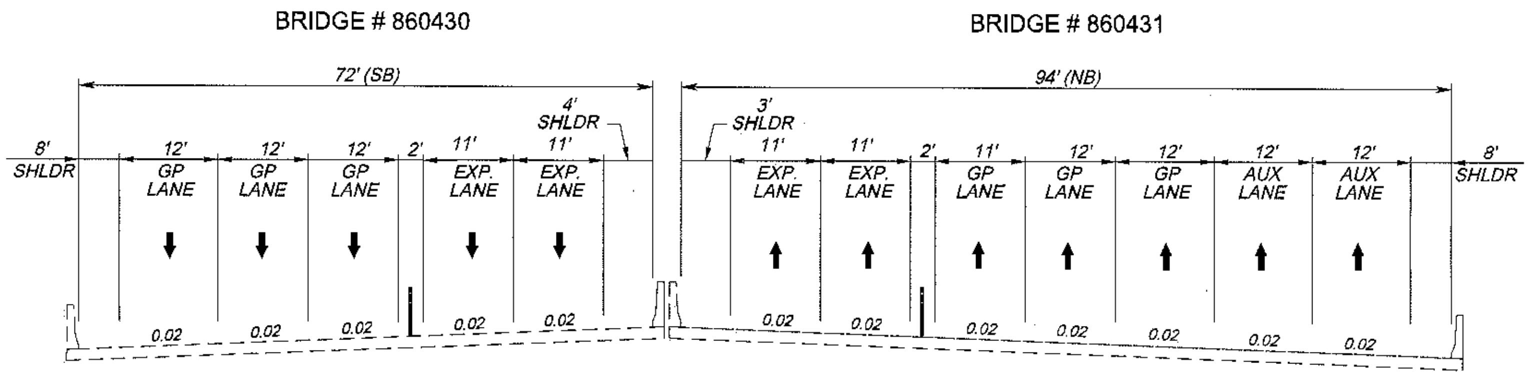
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID 429804-1-22-01 FEDERAL AID PROJECT NO. TBD COUNTY NAME BROWARD COUNTY

SECTION NO. 86070000 ROAD DESIGNATION SR 9 / I-95 LIMITS/MILEPOST M.P. 5.093 TO M.P. 13.742

PROJECT DESCRIPTION SR 9/I-95 PD&E STUDY FROM SR 848/STIRLING ROAD TO NORTH OF SR 816/OAKLAND PARK BOULEVARD

PROPOSED STRUCTURE TYPICAL SECTION



TYPICAL SECTION
I-95 BRIDGE OVER SOUTH FORK NEW RIVER
BRIDGE NO.: 860430 AND 860431
DESIGN SPEED = 65 MPH

FHWA CONCURRENCE

Mark Clasgens, PE
FHWA Transportation Engineer
Date

APPROVED BY	FDOT CONCURRENCE	RECOMMENDED BY	FDOT CONCURRENCE
Silvia M. Beltre, PE No. 51295 Engineer of Record — 5/30/13 Date	Howard Webb, PE FDOT District IV Design Engineer — 6-7-13 Date	Richard Young, PE FDOT Project Development Engineer — 6/7/13 Date	Fred Ochoa, PE FDOT District IV Structures Design Engineer — 6/18/13 Date

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PROJECT IDENTIFICATION

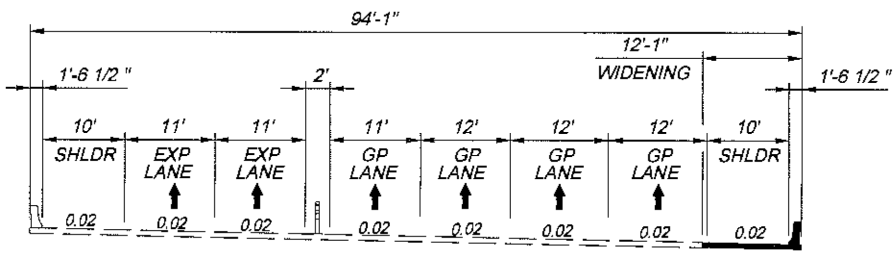
FINANCIAL PROJECT ID 429804-1-22-01 FEDERAL AID PROJECT NO. TBD COUNTY NAME BROWARD COUNTY

SECTION NO. 86070000 ROAD DESIGNATION SR 9 / I-95 LIMITS/MILEPOST M.P. 5.093 TO M.P. 13.742

PROJECT DESCRIPTION SR 9/I-95 PD&E STUDY FROM SR 848/STIRLING ROAD TO NORTH OF SR 816/OAKLAND PARK BOULEVARD

PROPOSED STRUCTURE TYPICAL SECTION

BRIDGE # 860271



TYPICAL SECTION
NORTHBOUND I-95 BRIDGE OVER NORTH FORK NEW RIVER
BRIDGE NO.: 860271
DESIGN SPEED = 65 MPH

FHWA CONCURRENCE	
Mark Clasgens, PE FHWA Transportation Engineer	Date

APPROVED BY		FDOT CONCURRENCE		RECOMMENDED BY		FDOT CONCURRENCE	
Silvia M. Beltre, PE No. 51295 Engineer of Record	5/30/13 Date	Howard Webb, PE FDOT District IV Design Engineer	6-7-13 Date	Richard Young, PE FDOT Project Development Engineer	6/7/13 Date	Fred Ochoa, PE FDOT District IV Structures Design Engineer	6/18/13 Date

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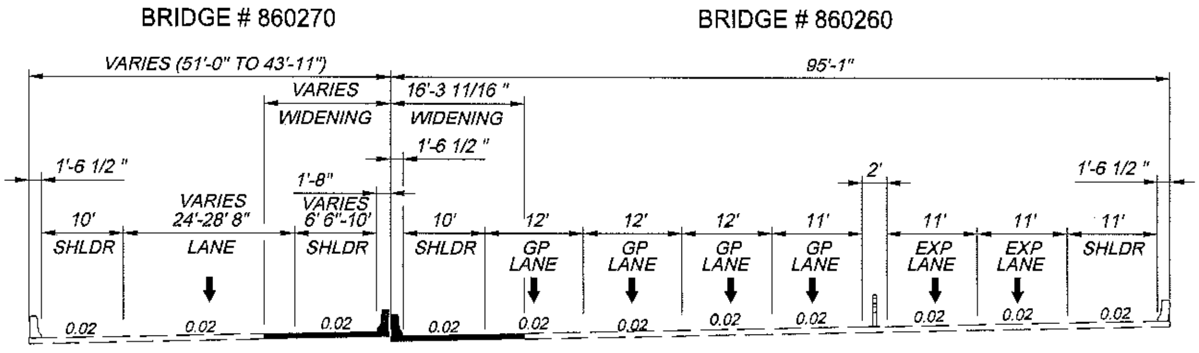
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID 429804-1-22-01 FEDERAL AID PROJECT NO. TBD COUNTY NAME BROWARD COUNTY

SECTION NO. 86070000 ROAD DESIGNATION SR 9 / I-95 LIMITS/MILEPOST M.P. 5.093 TO M.P. 13.742

PROJECT DESCRIPTION SR 9/I-95 PD&E STUDY FROM SR 848/STIRLING ROAD TO NORTH OF SR 816/OAKLAND PARK BOULEVARD

PROPOSED STRUCTURE TYPICAL SECTION



TYPICAL SECTION
SOUTHBOUND I-95 BRIDGE OVER NORTH FORK NEW RIVER
AND SOUTHBOUND I-95 OFF-RAMP TO BROWARD BOULEVARD
BRIDGE NO.: 860270 AND 860260
DESIGN SPEED = 65 MPH

FHWA CONCURRENCE

Mark Clasgens, PE
FHWA Transportation Engineer
Date

APPROVED BY	FDOT CONCURRENCE	RECOMMENDED BY	FDOT CONCURRENCE
Silvia M. Beltre, PE No. 51295, Engineer of Record — Date 5/30/13	Howard Webb, PE, FDOT District IV Design Engineer — Date 6-7-13	Richard Young, PE, FDOT Project Development Engineer — Date 6/7/13	Fred Ochoa, PE, FDOT District IV Structures Design Engineer — Date 6/18/13

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PROJECT IDENTIFICATION

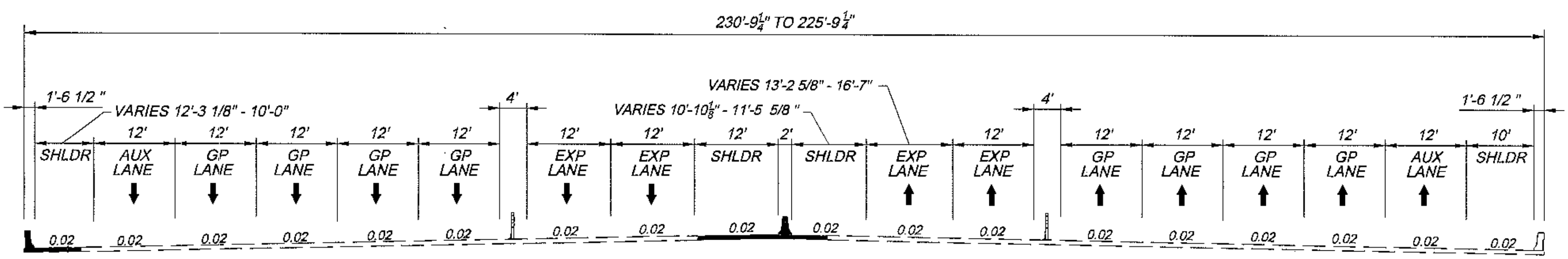
FINANCIAL PROJECT ID 429804-1-22-01 FEDERAL AID PROJECT NO. TBD COUNTY NAME BROWARD COUNTY

SECTION NO. 86070000 ROAD DESIGNATION SR 9 / I-95 LIMITS/MILEPOST M.P. 5.093 TO M.P. 13.742

PROJECT DESCRIPTION SR 9/I-95 PD&E STUDY FROM SR 848/STIRLING ROAD TO NORTH OF SR 816/OAKLAND PARK BOULEVARD

PROPOSED STRUCTURE TYPICAL SECTION

BRIDGE # 860272 BRIDGE # 860273



TYPICAL SECTION
I-95 BRIDGE OVER NW 6 STREET
BRIDGE NO.: 860272 AND 860273
DESIGN SPEED = 65 MPH

FHWA CONCURRENCE

Mark Clasgens, PE
FHWA Transportation Engineer
Date

APPROVED BY	FDOT CONCURRENCE	RECOMMENDED BY	FDOT CONCURRENCE
5/30/13 Silvia M. Beltre, PE No. 51295 Engineer of Record Date	6-7-13 Howard Webb, PE FDOT District IV Design Engineer Date	6/7/13 Richard Young, PE FDOT Project Development Engineer Date	6/18/13 Fred Ochoa, PE FDOT District IV Structures Design Engineer Date

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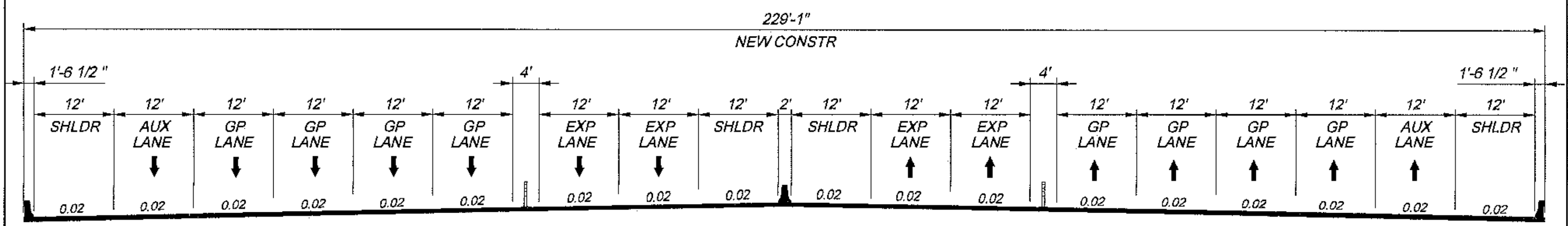
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID 429804-1-22-01 FEDERAL AID PROJECT NO. TBD COUNTY NAME BROWARD COUNTY

SECTION NO. 86070000 ROAD DESIGNATION SR 9 / I-95 LIMITS/MILEPOST M.P. 5.093 TO M.P. 13.742

PROJECT DESCRIPTION SR 9/I-95 PD&E STUDY FROM SR 848/STIRLING ROAD TO NORTH OF SR 816/OAKLAND PARK BOULEVARD

PROPOSED STRUCTURE TYPICAL SECTION



TYPICAL SECTION
I-95 BRIDGE OVER NW 19 STREET
DESIGN SPEED = 65 MPH

NOTE:
LOAD RATING ANALYSIS UNDER REVIEW
TO DETERMINE IF EXISTING BRIDGES
CAN BE WIDENED.

APPROVED BY	FDOT CONCURRENCE	RECOMMENDED BY	FDOT CONCURRENCE
5/30/13 Date	6-7-13 Date	6/7/13 Date	6/18/13 Date
Silvia M. Beltre, PE No. 51295 Engineer of Record	Howard Webb, PE FDOT District IV Design Engineer	Richard Young, PE FDOT Project Development Engineer	Fred Ochoa, PE FDOT District IV Structures Design Engineer

FHWA CONCURRENCE

Mark Clasgens, PE
FHWA Transportation Engineer
Date

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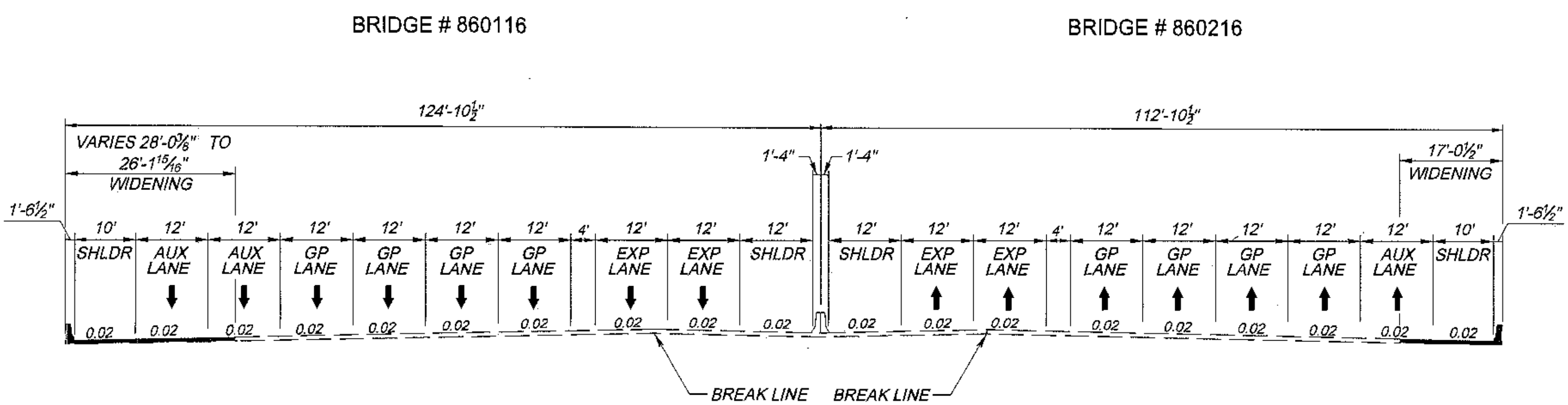
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID 429804-1-22-01 FEDERAL AID PROJECT NO. TBD COUNTY NAME BROWARD COUNTY

SECTION NO. 86070000 ROAD DESIGNATION SR 9 / I-95 LIMITS/MILEPOST M.P. 5.093 TO M.P. 13.742

PROJECT DESCRIPTION SR 9/I-95 PD&E STUDY FROM SR 848/STIRLING ROAD TO NORTH OF SR 816/OAKLAND PARK BOULEVARD

PROPOSED STRUCTURE TYPICAL SECTION



TYPICAL SECTION
I-95 BRIDGE OVER C-13 CANAL
BRIDGE NO.: 860116 AND 860216
DESIGN SPEED = 65 MPH

FHWA CONCURRENCE

Mark Clasgens, PE
FHWA Transportation Engineer
Date

APPROVED BY	FDOT CONCURRENCE	RECOMMENDED BY	FDOT CONCURRENCE
5/30/13 Date Silvia M. Beltre, PE No. 51295 Engineer of Record	6-7-13 Date Howard Webb, PE FDOT District IV Design Engineer	6/7/13 Date Richard Young, PE FDOT Project Development Engineer	6/18/13 Date Fred Ochoa, PE FDOT District IV Structures Design Engineer

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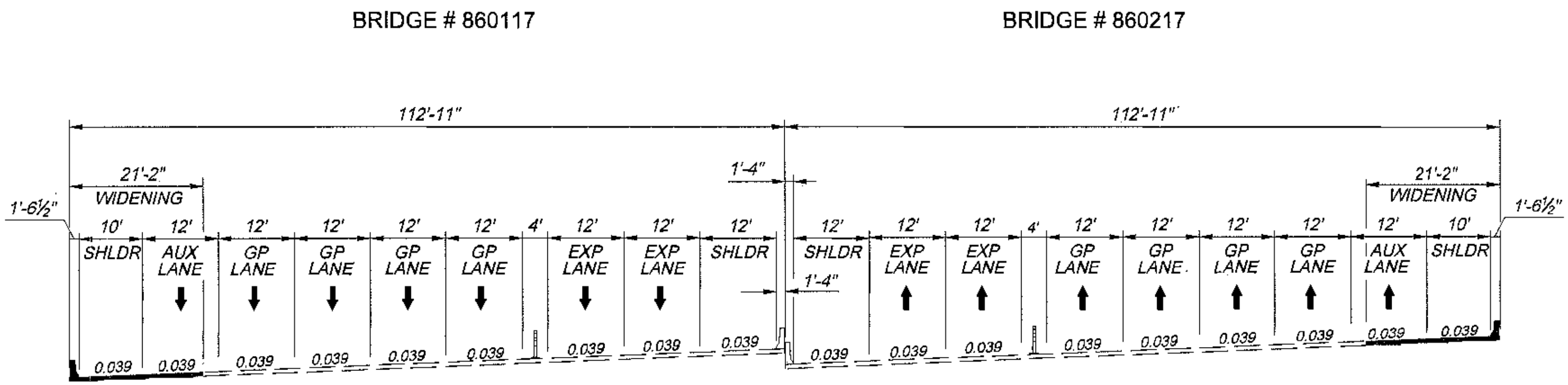
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID	429804-1-22-01	FEDERAL AID PROJECT NO.	TBD	COUNTY NAME	BROWARD COUNTY
SECTION NO.	86070000	ROAD DESIGNATION	SR 9 / I-95	LIMITS/MILEPOST	M.P. 5.093 TO M.P. 13.742

PROJECT DESCRIPTION SR 9/I-95 PD&E STUDY FROM SR 848/STIRLING ROAD TO NORTH OF SR 816/OAKLAND PARK BOULEVARD

PROPOSED STRUCTURE TYPICAL SECTION



TYPICAL SECTION
I-95 BRIDGE OVER OAKLAND PARK BOULEVARD
BRIDGE NO.: 860117 AND 860217
DESIGN SPEED = 65 MPH

FHWA CONCURRENCE

Mark Clasgens, PE
FHWA Transportation Engineer
Date

APPROVED BY	FDOT CONCURRENCE	RECOMMENDED BY	FDOT CONCURRENCE
5/30/13 Date	6-7-13 Date	6/7/13 Date	6/18/13 Date
Silvia M. Beltre, PE No. 51295 Engineer of Record	Howard Webb, PE FDOT District IV Design Engineer	Richard Young, PE FDOT Project Development Engineer	Fred Ochoa, PE FDOT District IV Structures Design Engineer

dachang 5/30/2013 4:23:30 PM V:\2167\active\216700070\B-Engineering\4. Typical Sections\Typical Section Package\TYPSP.dgn

APPENDIX E

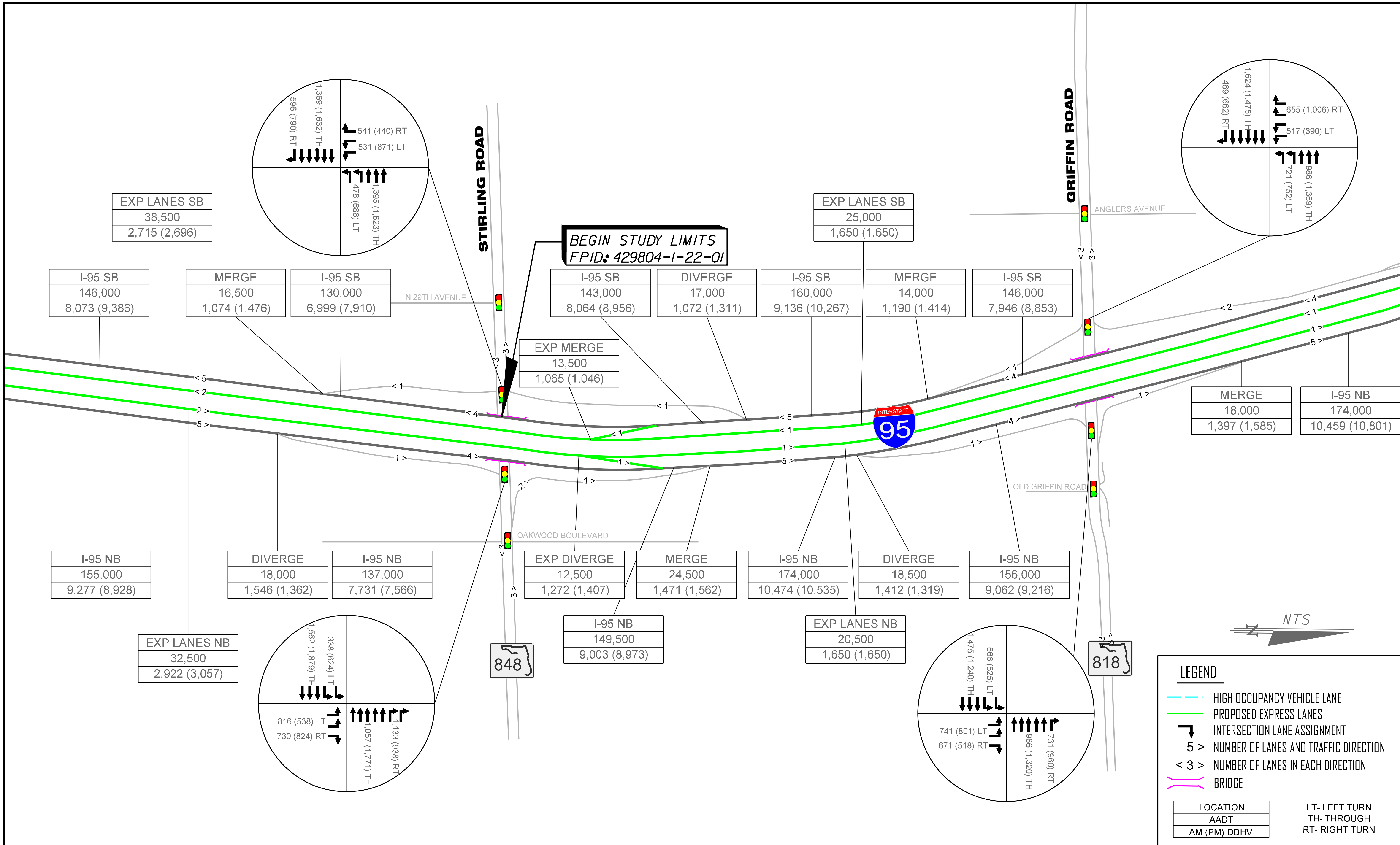
Design Variations & Exceptions Packages

(These files are included electronically within the CD provided)

APPENDIX F

Future Traffic Volumes

No-Build Alternative 2040



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

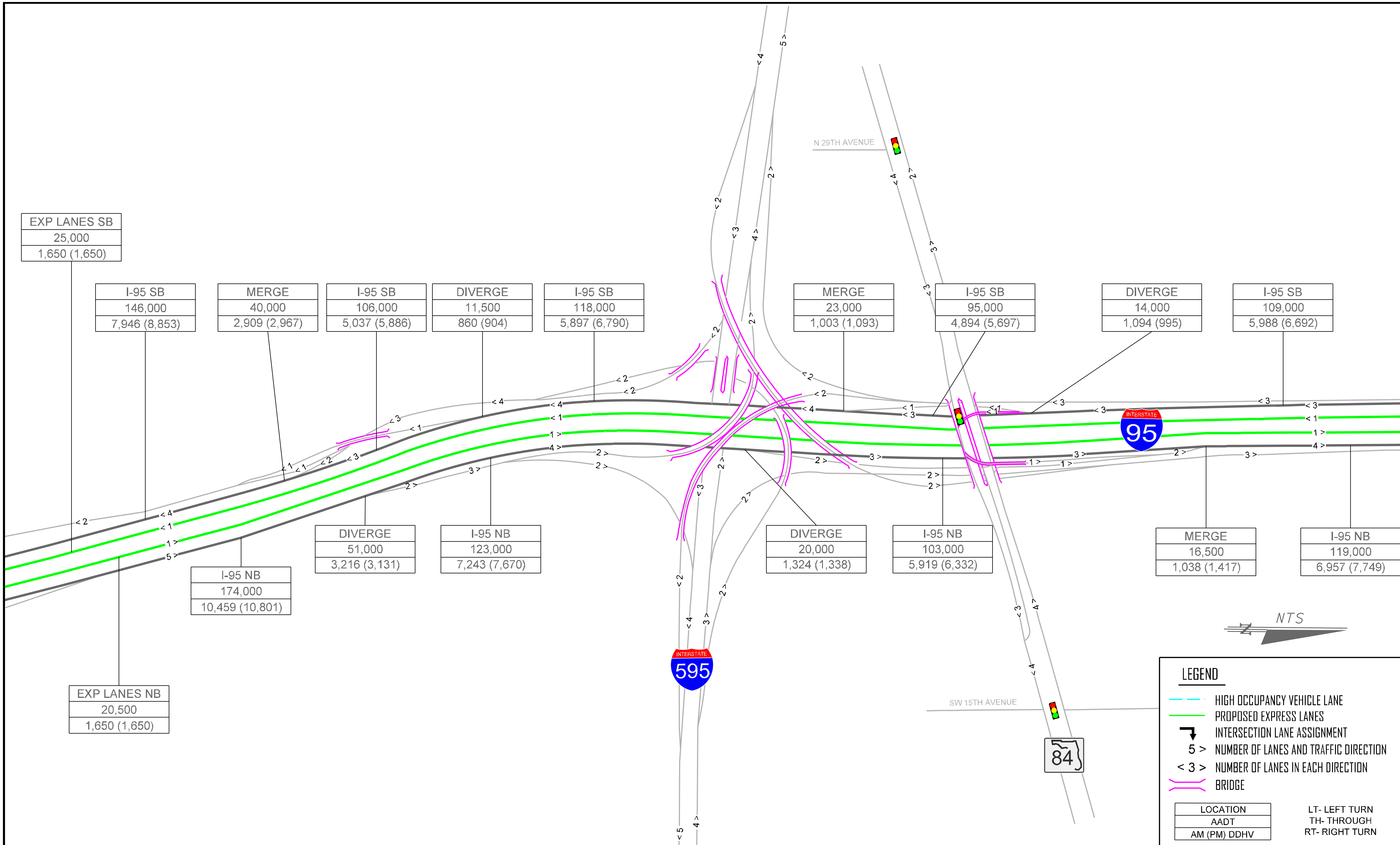
November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 & 412420-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) NO-BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2040 AADT AND DDHV VOLUMES

SHEET NO.
1



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

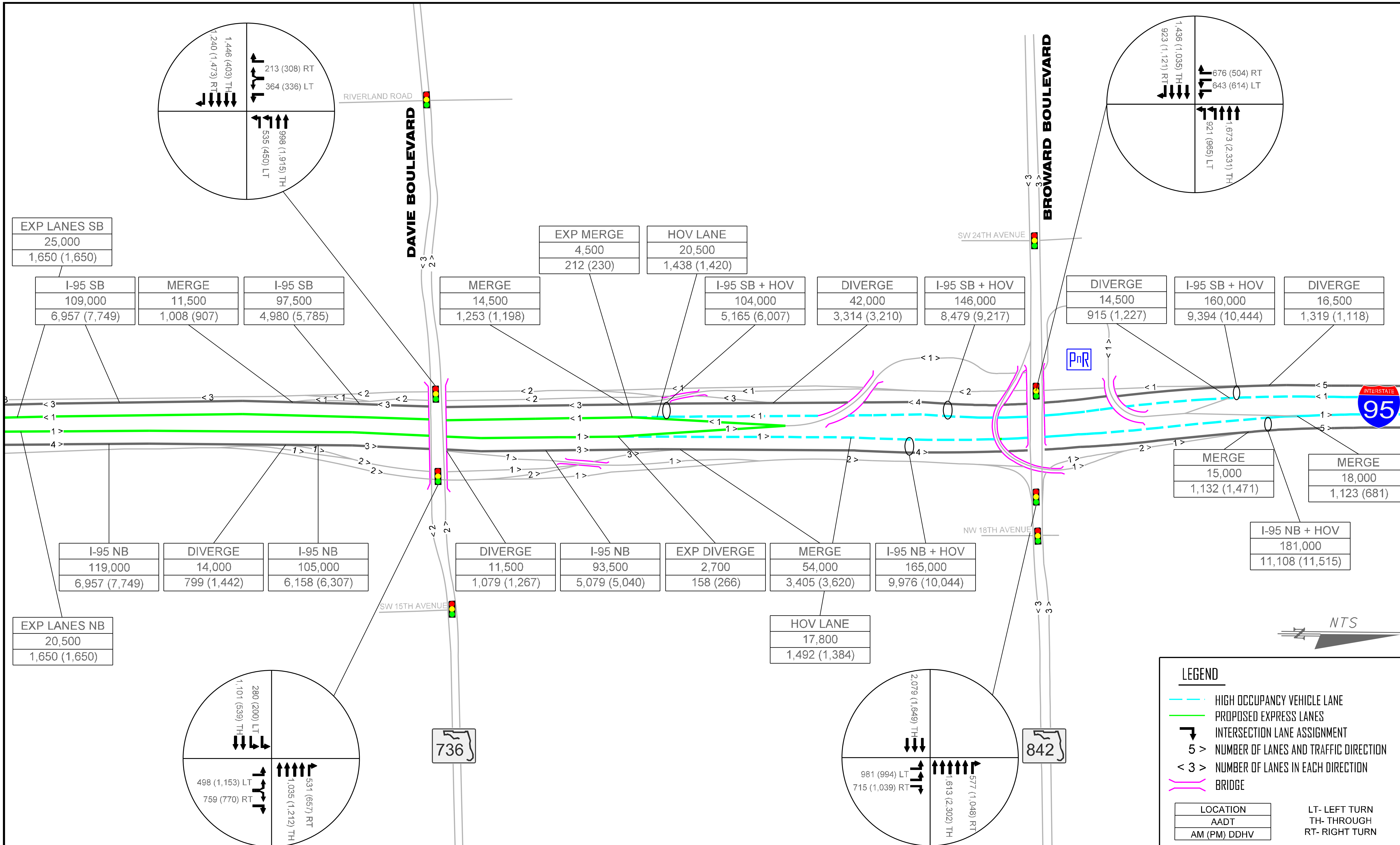
November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 & 412420-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) NO-BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2040 AADT AND DDHV VOLUMES

SHEET NO.
2



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

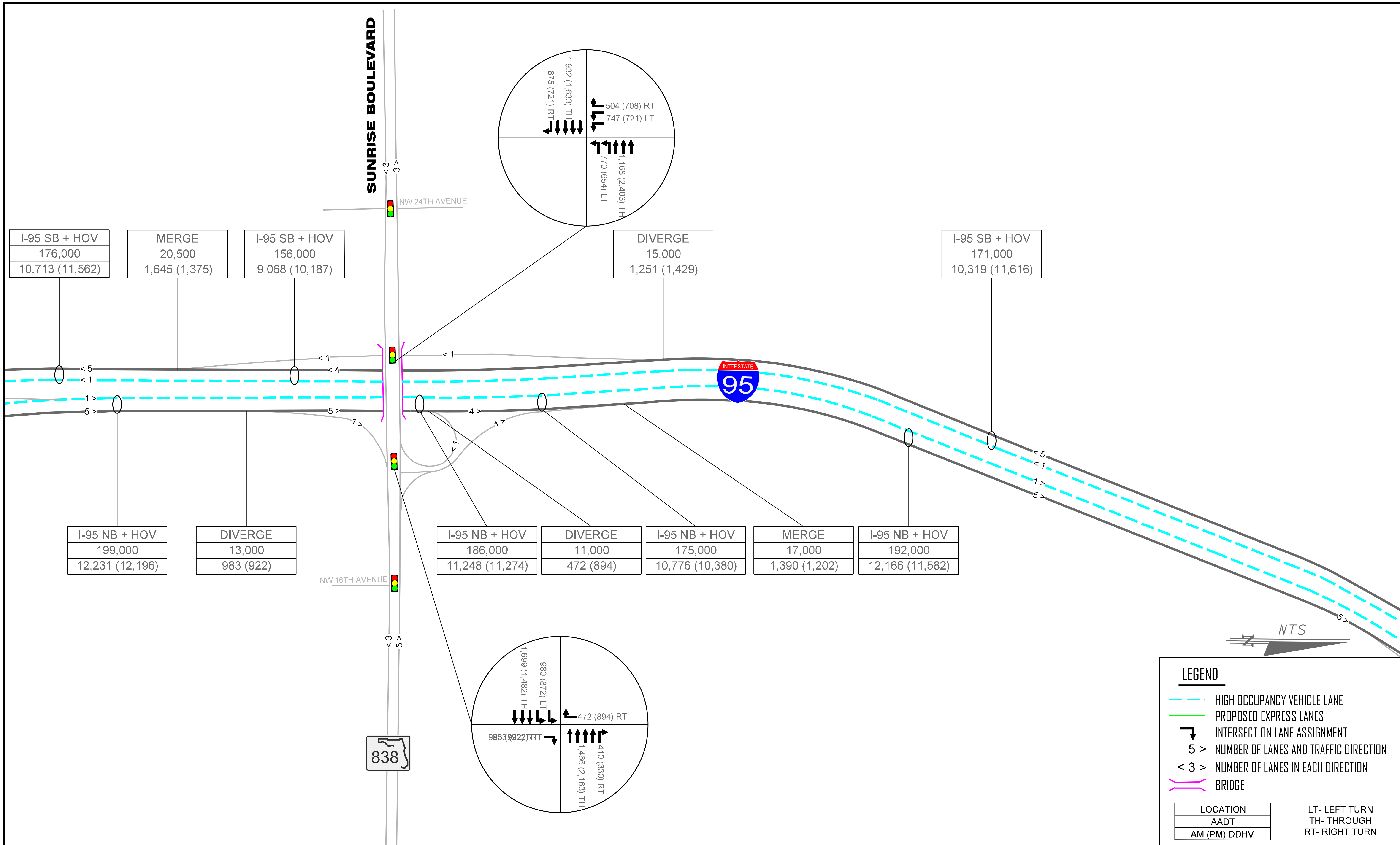
November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 & 412420-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) NO-BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2040 AADT AND DDHV VOLUMES

SHEET NO.
3



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

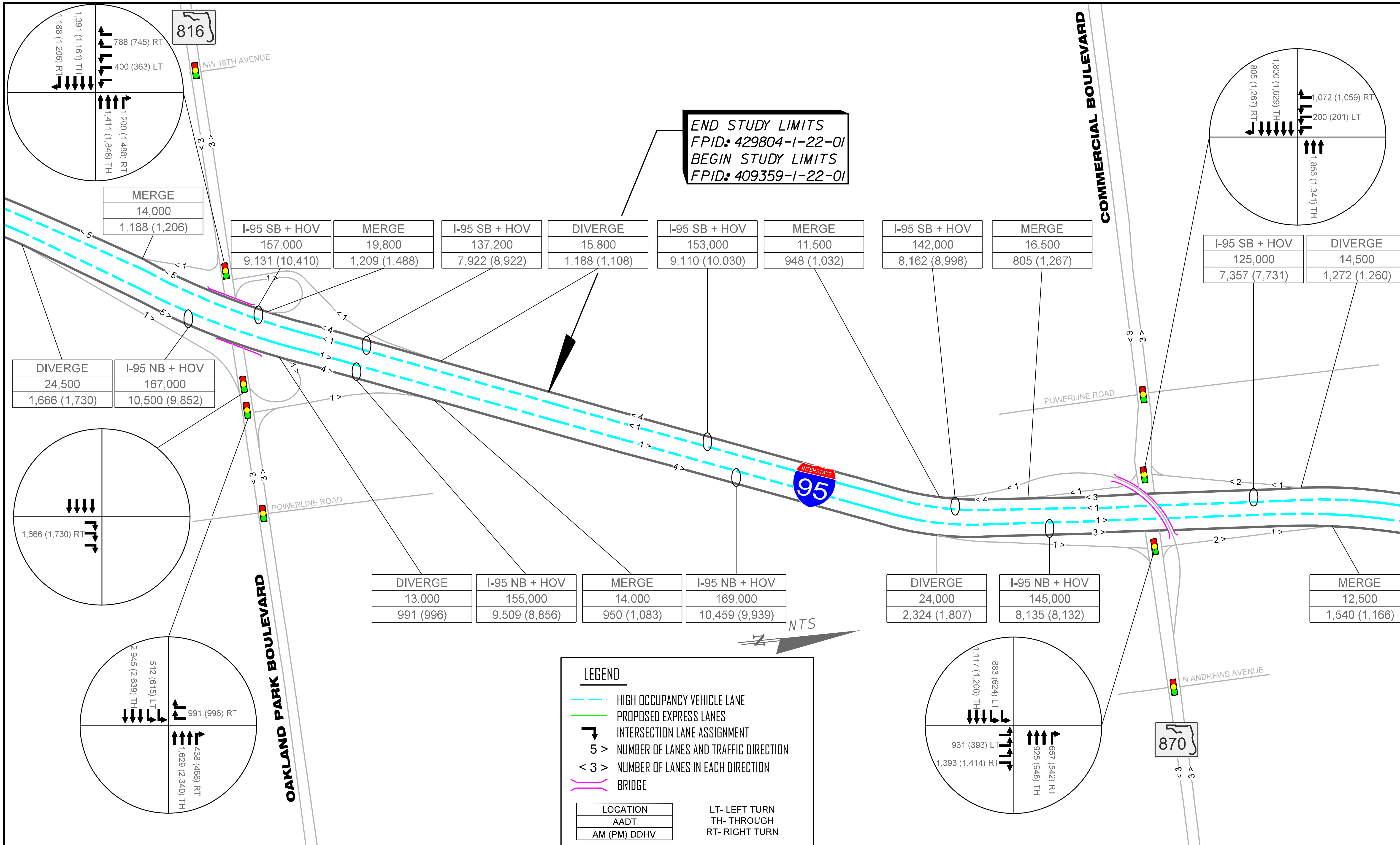
November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 & 412420-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) NO-BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2040 AADT AND DDHV VOLUMES

SHEET NO. 4



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 & 412420-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) NO-BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2040 AADT AND DDHV VOLUMES

SHEET NO.
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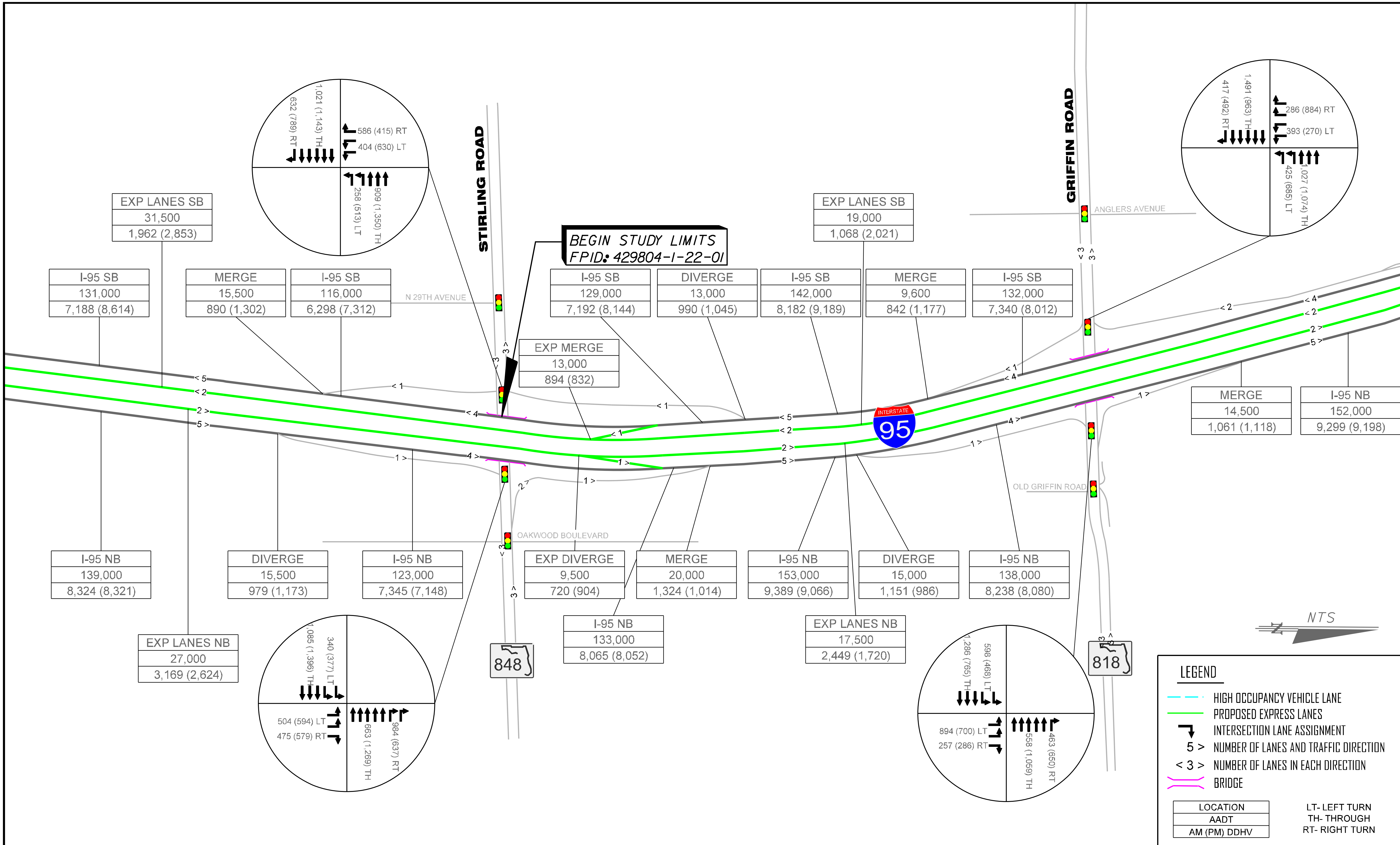
Build Alternative 2020



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2020 AADT AND DDHV VOLUMES

SHEET NO.
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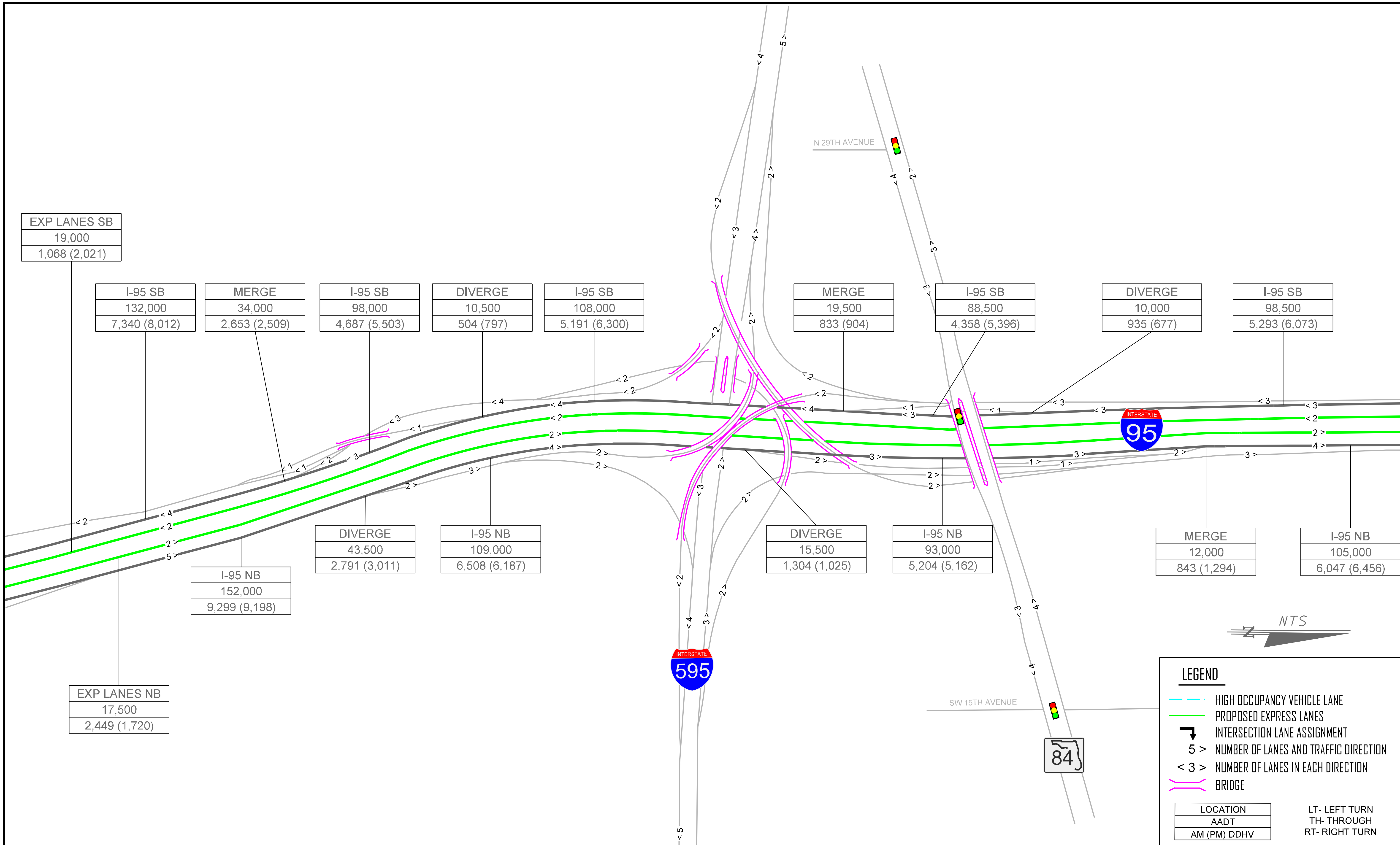


FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

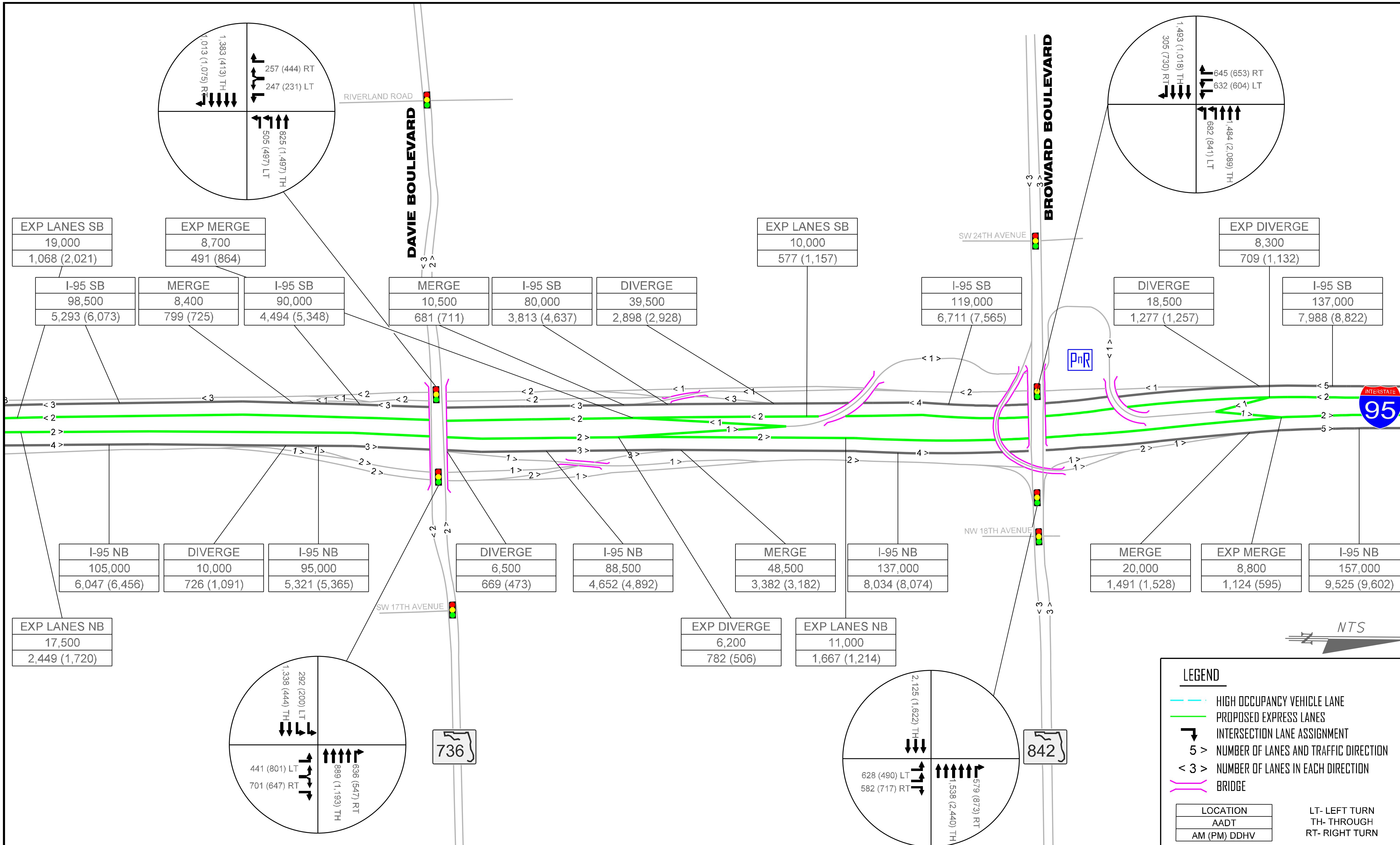
November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2020 AADT AND DDHV VOLUMES

SHEET NO. 2



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

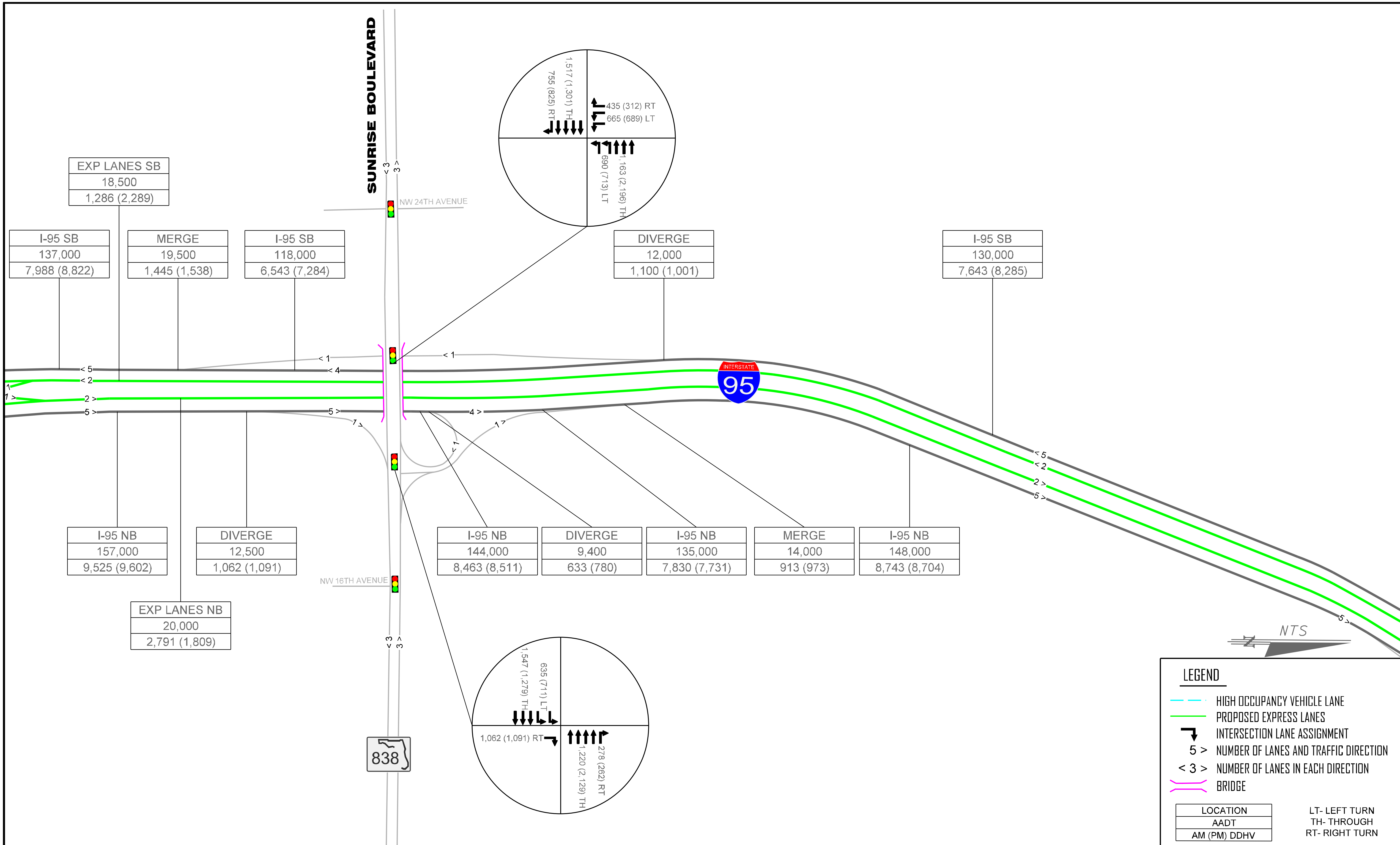
November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2020 AADT AND DDHV VOLUMES

SHEET NO.
3



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

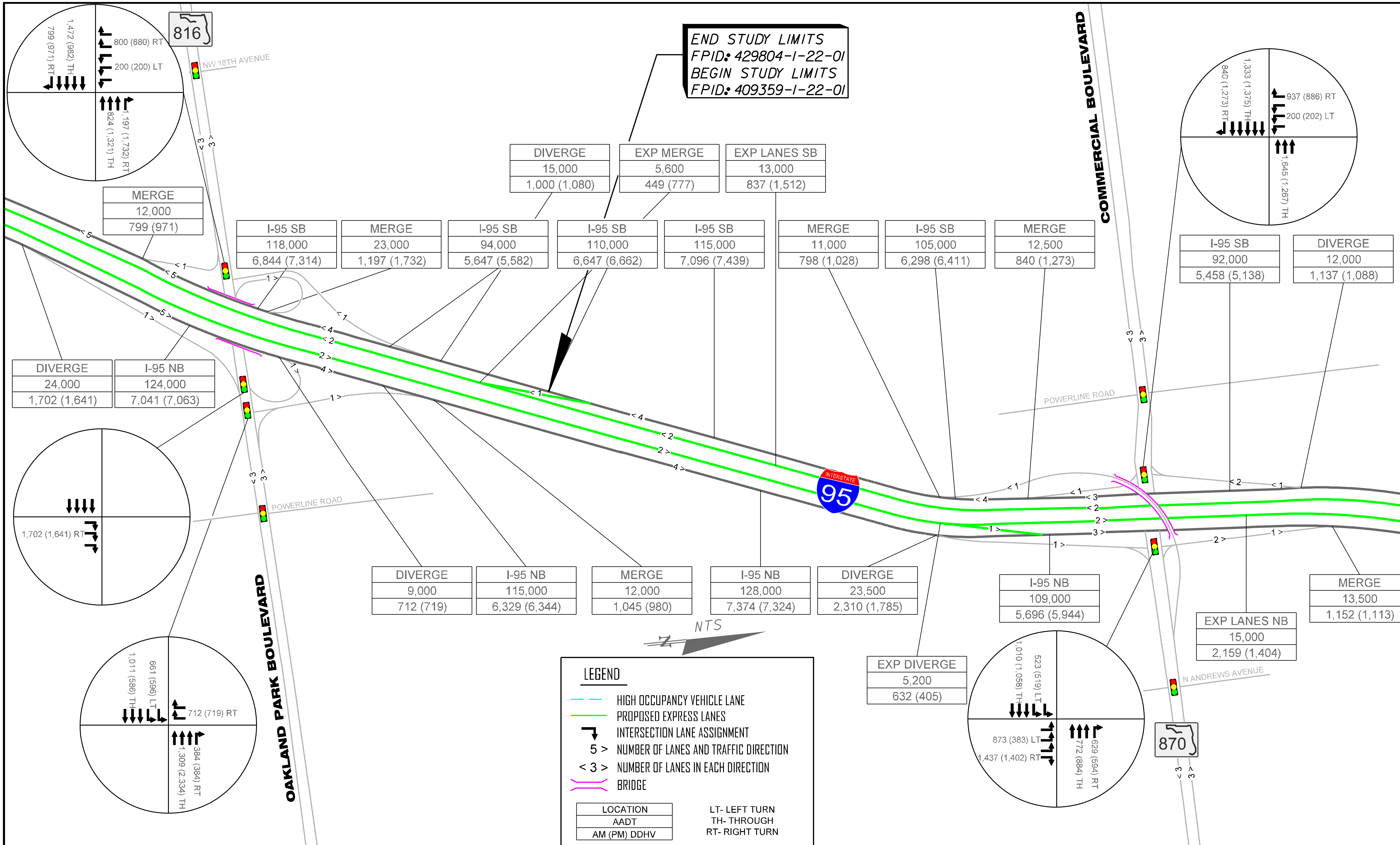
November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2020 AADT AND DDHV VOLUMES

SHEET NO.
4



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

November 2012

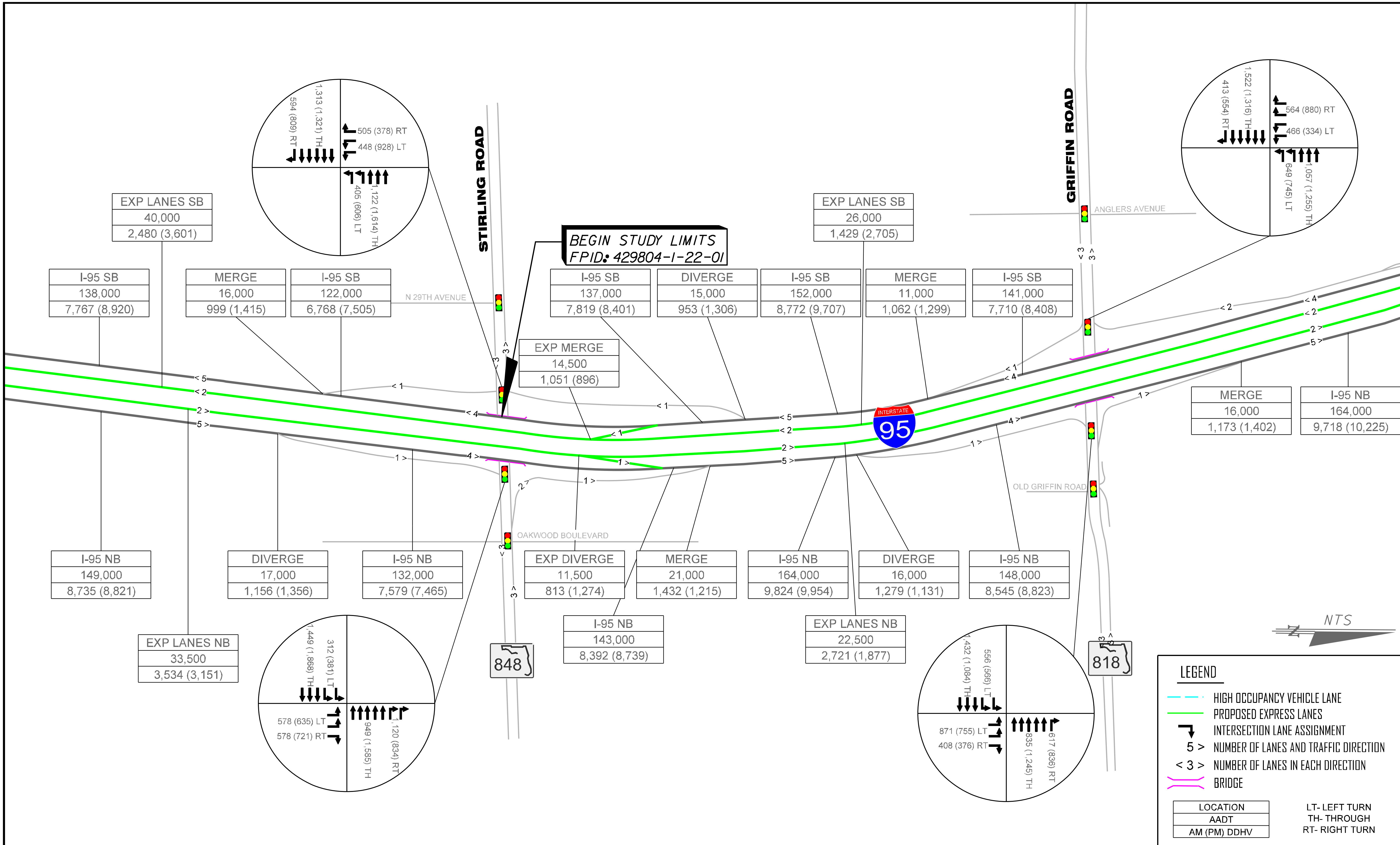
I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2020 AADT AND DDHV VOLUMES

SHEET NO. 5

Build Alternative 2030



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

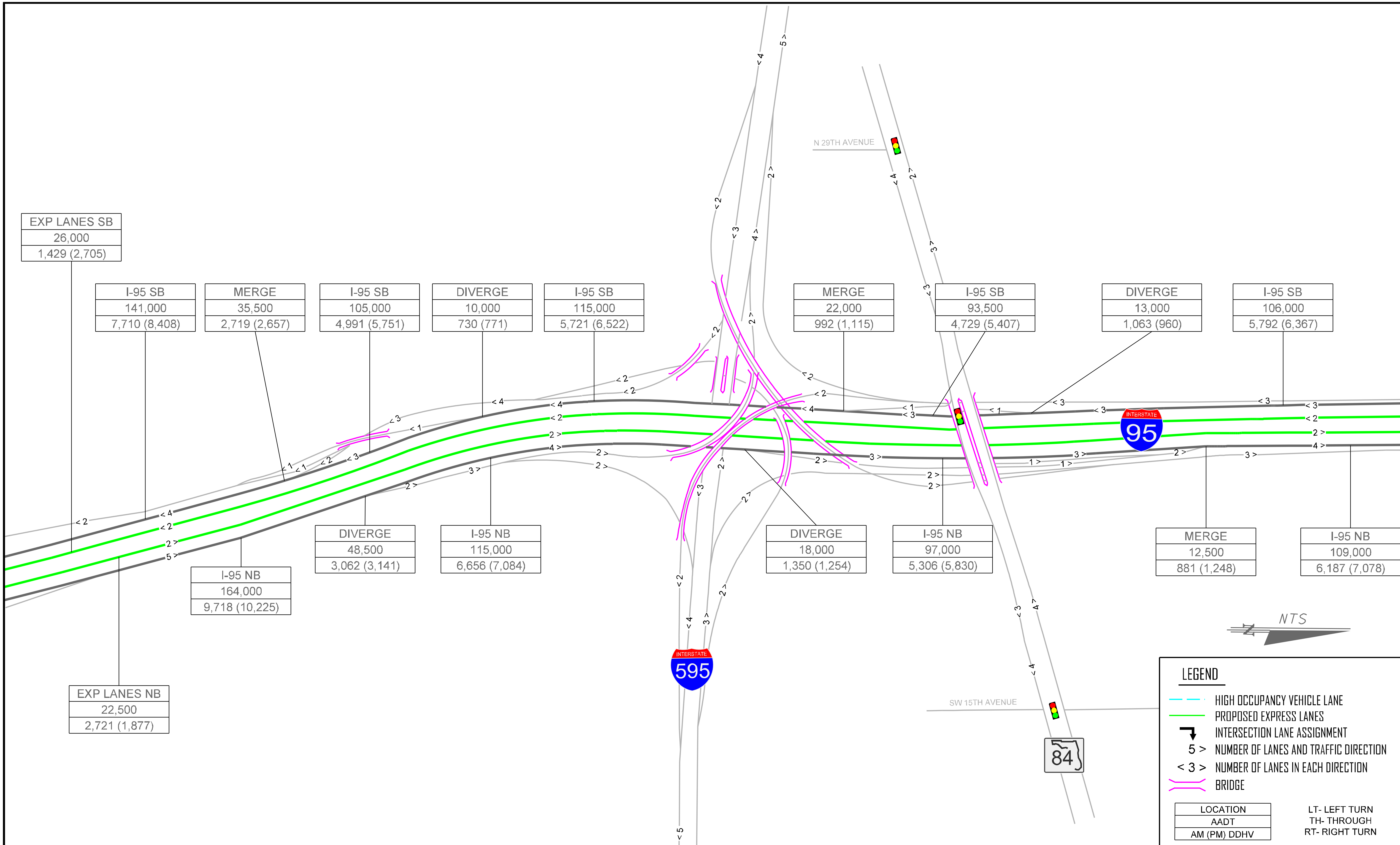
November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2030 AADT AND DDHV VOLUMES

SHEET NO. 1



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

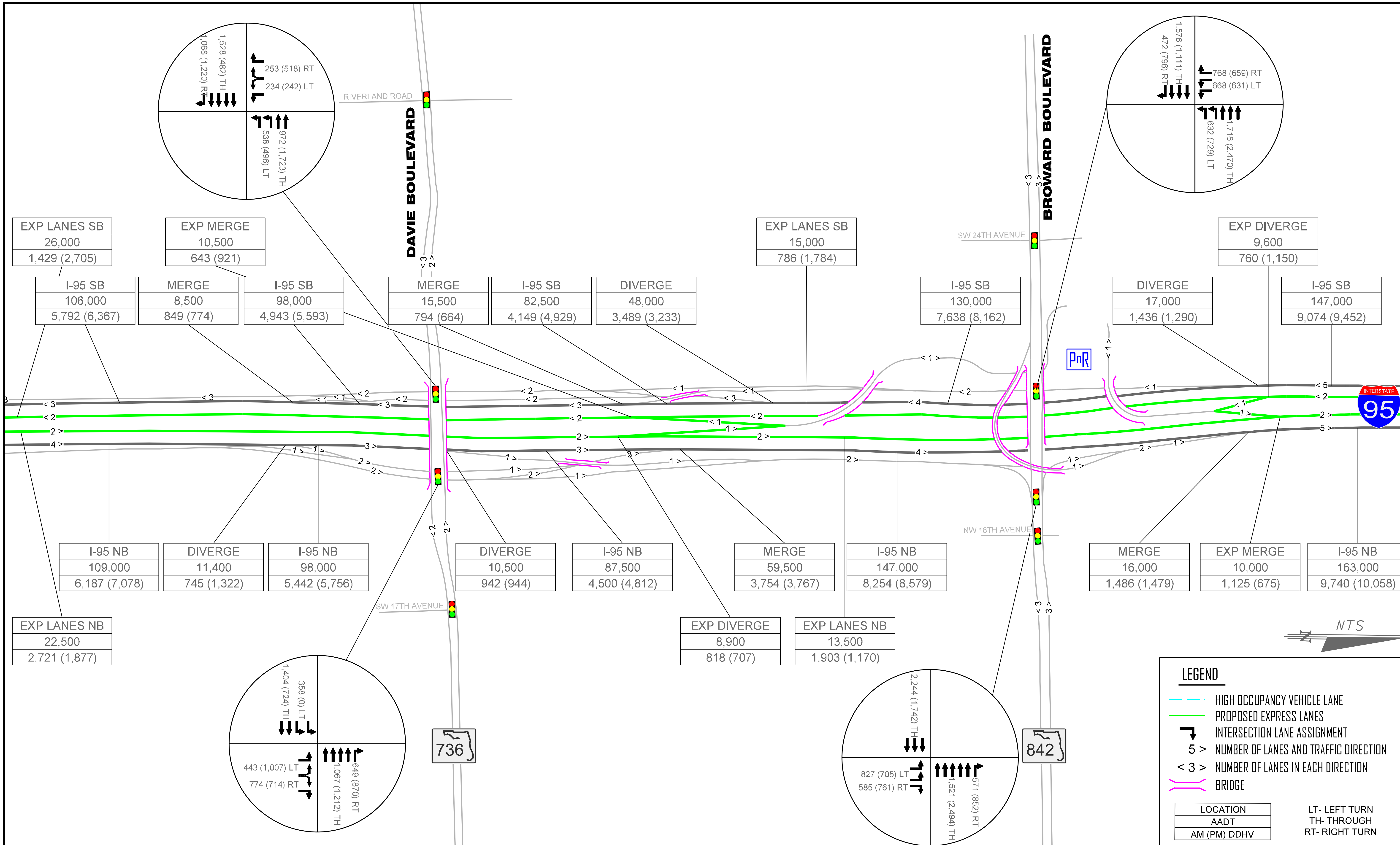
November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2030 AADT AND DDHV VOLUMES

SHEET NO.
2



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

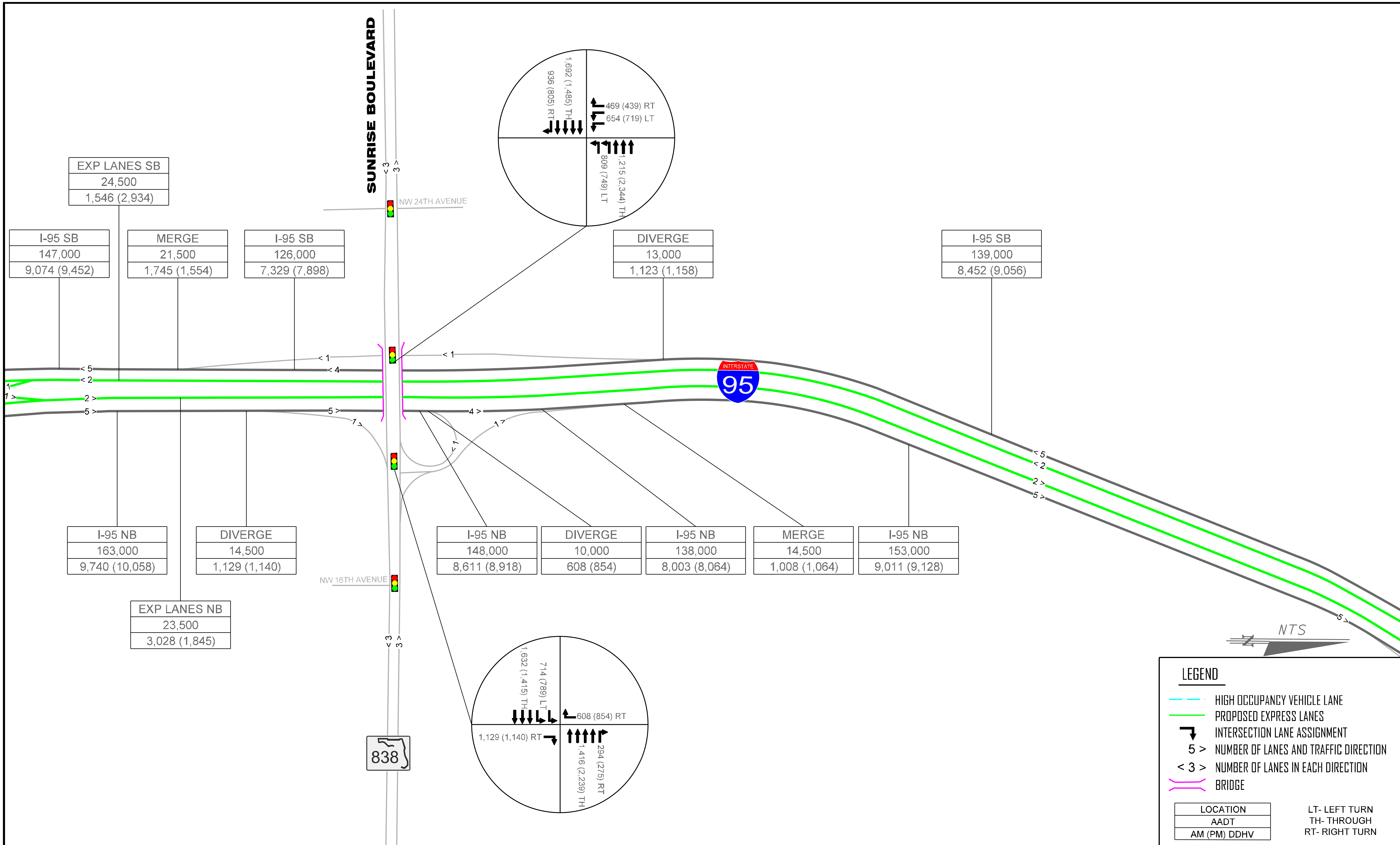
November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2030 AADT AND DDHV VOLUMES

SHEET NO. 3



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

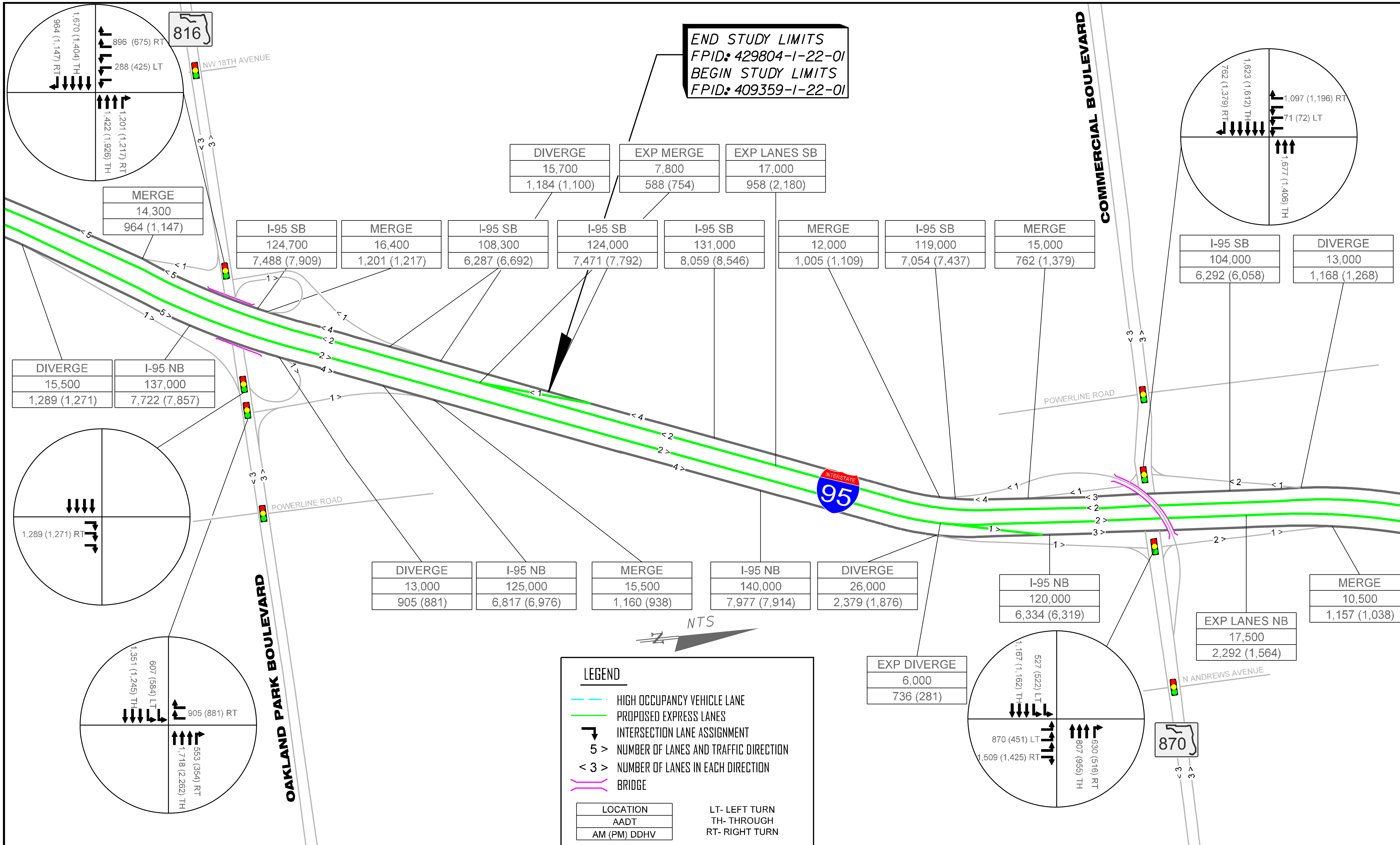
November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2030 AADT AND DDHV VOLUMES

SHEET NO.
4



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

November 2012

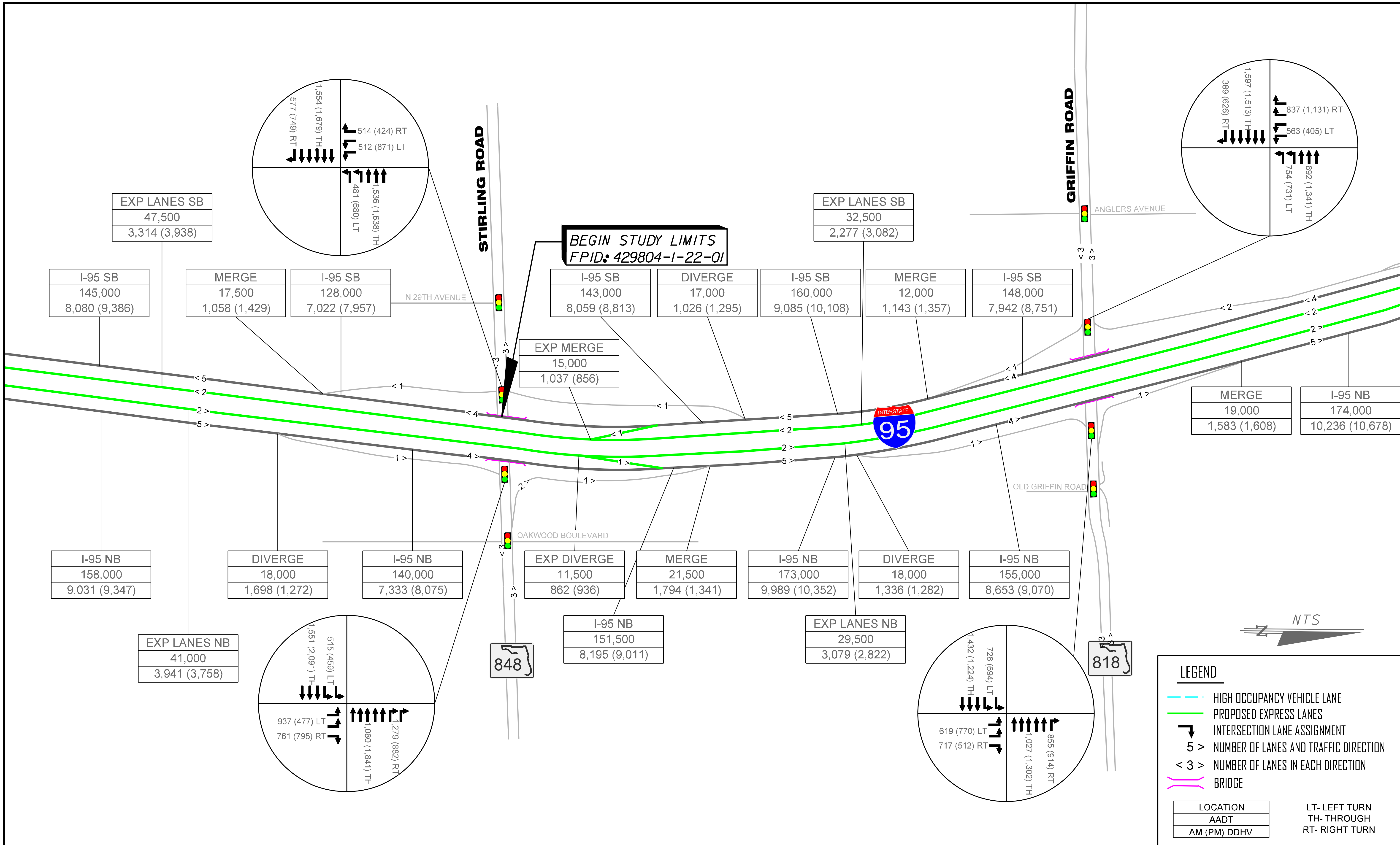
I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2030 AADT AND DDHV VOLUMES

SHEET NO.
5

Build Alternative 2040



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

November 2012

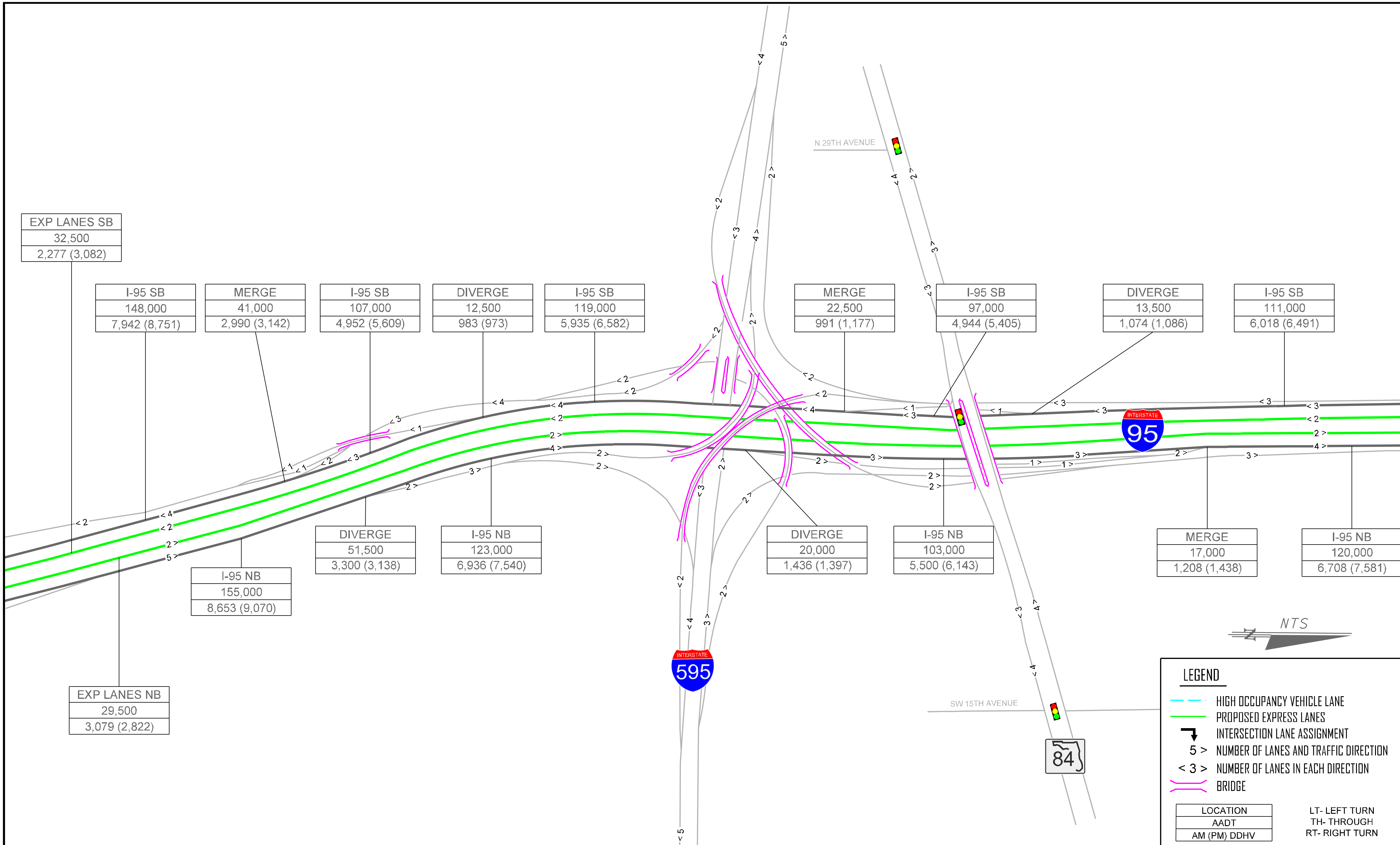
I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 & 412420-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE LANE GEOMETRY AND CONFIGURATIONS 2040 AADT AND DDHV VOLUMES

SHEET NO.

1



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

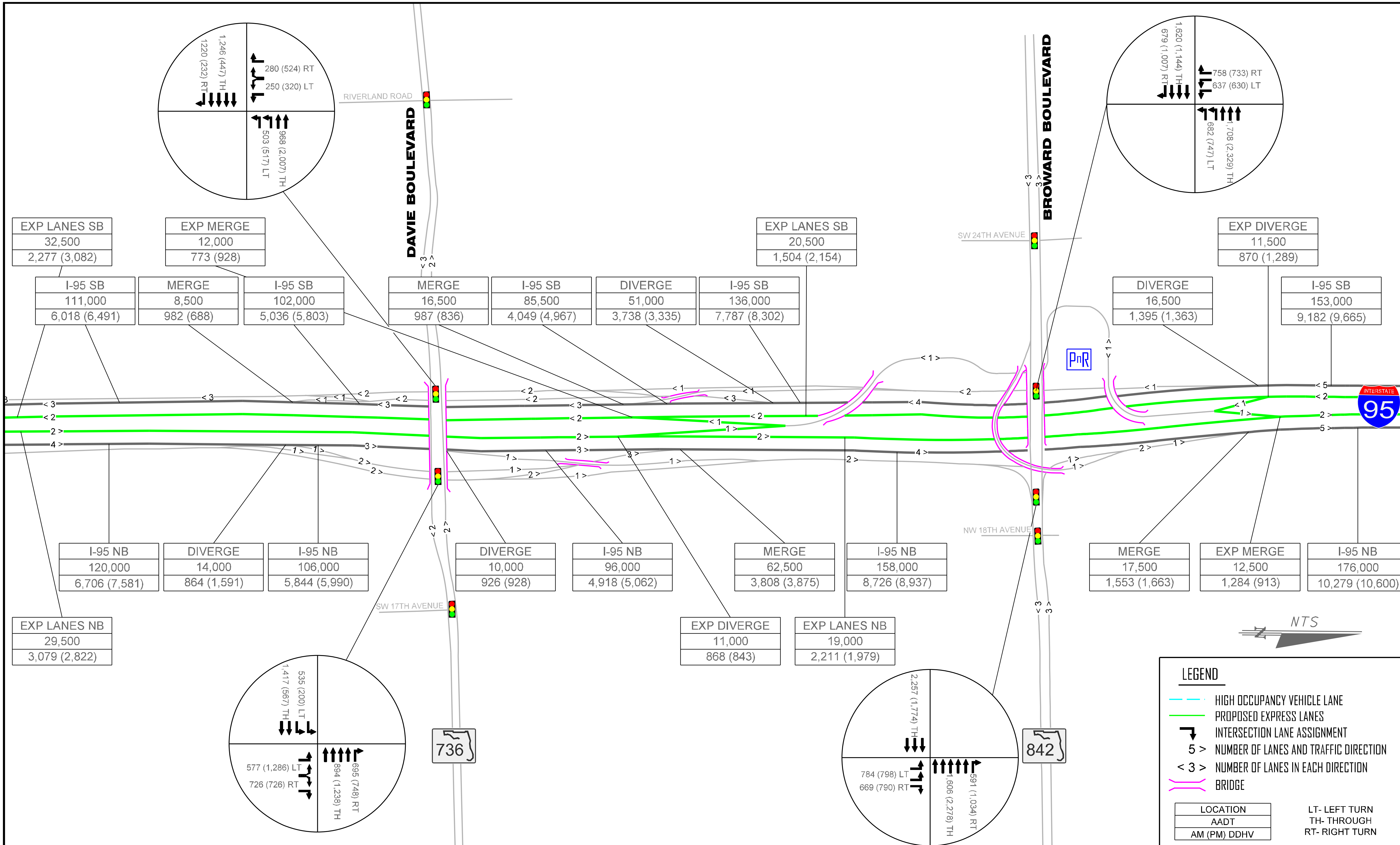
November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 & 412420-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2040 AADT AND DDHV VOLUMES

SHEET NO.
2



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

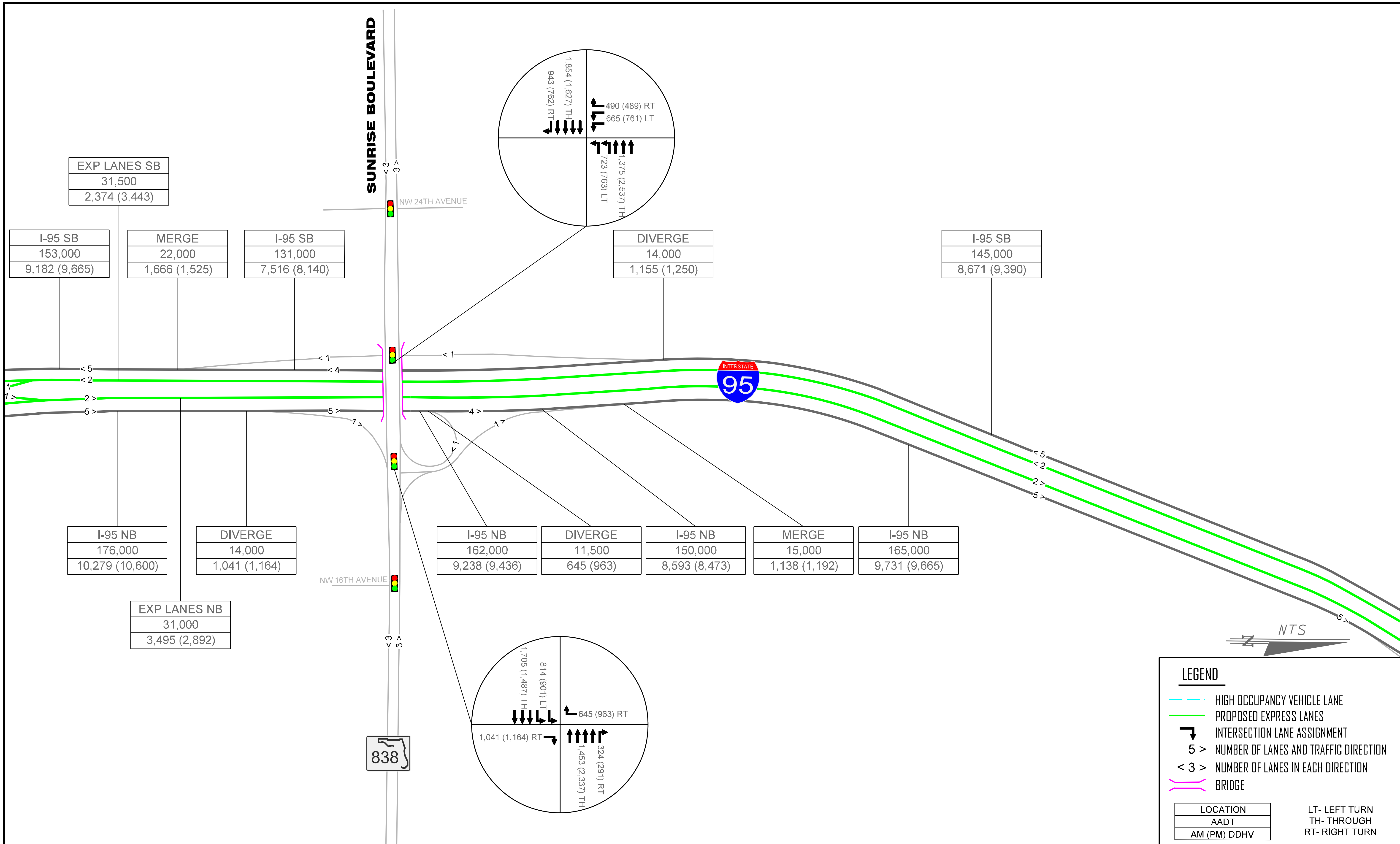
November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 & 412420-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2040 AADT AND DDHV VOLUMES

SHEET NO.
3



FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

November 2012

I-95 (SR 9) PD&E STUDY

FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 & 412420-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2040 AADT AND DDHV VOLUMES

SHEET NO.
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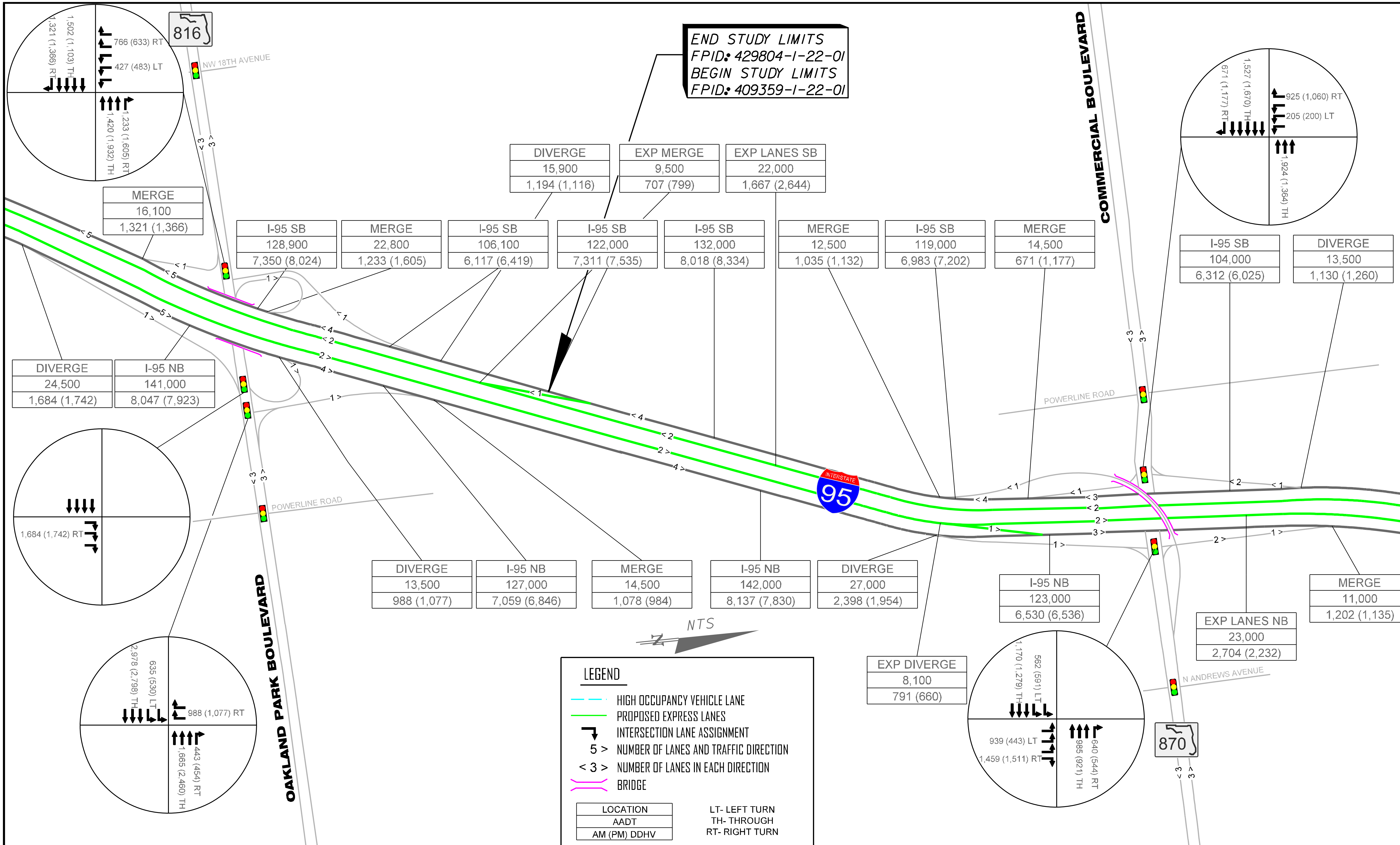


FLORIDA DEPARTMENT OF TRANSPORTATION
BROWARD AND PALM BEACH COUNTIES

November 2012

I-95 (SR 9) PD&E STUDY
FPID: 429804-1-22-01 & 409359-1-22-01 (BROWARD COUNTY)
FPID: 409355-1-22-01 & 412420-1-22-01 (PALM BEACH COUNTY)

SR 9 (INTERSTATE 95) BUILD ALTERNATIVE
LANE GEOMETRY AND CONFIGURATIONS
2040 AADT AND DDHV VOLUMES

SHEET NO.
5

APPENDIX G

Concept Plans

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

PRELIMINARY PD&E CONCEPT PLANS

FINANCIAL PROJECT ID 429804-1-22-01
BROWARD COUNTY (86070)
STATE ROAD NO. 9 (I-95)
FROM STIRLING ROAD TO NORTH OF OAKLAND PARK BOULEVARD

A DETAILED INDEX APPEARS ON THE KEY SHEET OF EACH COMPONENT

INDEX OF ROADWAY PLANS

To Lauderdale Lakes

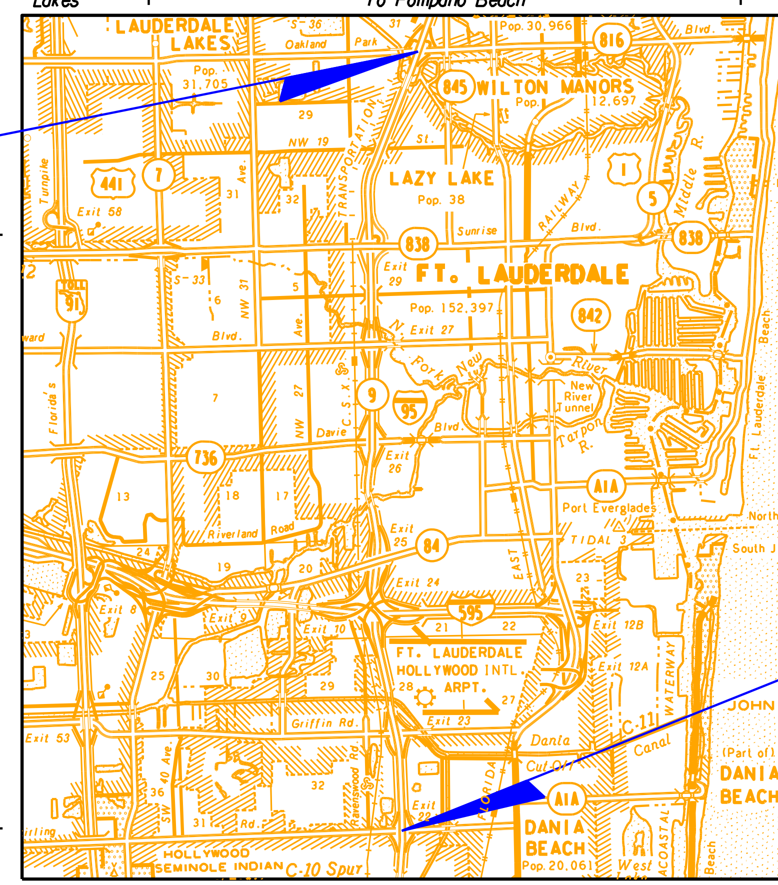
R-41-E | R-42-E

To Pompano Beach

R-42-E | R-43-E

END PROJECT
OAKLAND PARK BLVD.
MP 13.742

T-49-S / T-50-S



BEGIN PROJECT
STIRLING ROAD
MP 5.093

T-50-S / T-51-S

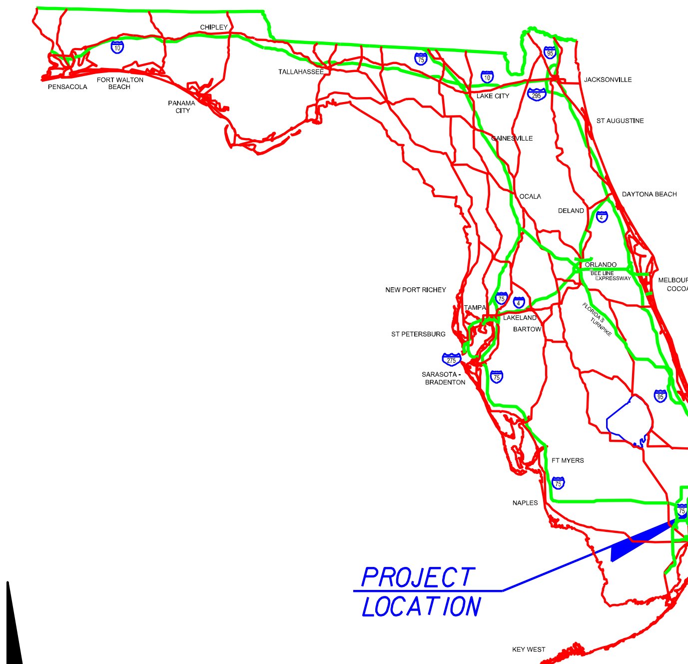
To Hollywood

R-41-E | R-42-E

R-42-E | R-43-E

N

0 1 2
Miles



PLANS PREPARED BY:

STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
MIAMI (305)-445-2900 FLORIDA (800)-448-0227
CERTIFICATION OF AUTHORIZATION NO. 00027013
VENDOR ID NO. 650039493001
CONSULTANT CONTRACT NO. C-8F17

GOVERNING STANDARDS AND SPECIFICATIONS:
FLORIDA DEPARTMENT OF TRANSPORTATION,
DESIGN STANDARDS DATED 2013,
AND STANDARD SPECIFICATIONS FOR ROAD AND
BRIDGE CONSTRUCTION DATED 2010,
AS AMENDED BY CONTRACT DOCUMENTS.

APPLICABLE DESIGN STANDARDS MODIFICATIONS: MM/DD/YY
For Design Standards modifications click on
"Design Standards" at the following web site:
http://www.dot.state.fl.us/rddesign/

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION.

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1
PRELIMINARY CONCEPT PLANS

LENGTH OF PROJECT

	LINEAR FEET	MILES
ROADWAY	42,221.52	7.996
BRIDGES	3,445.2	.653
NET LENGTH OF PROJECT	45,666.72	8.649
EXCEPTIONS	N/A	N/A
GROSS LENGTH OF PROJECT	45,666.72	8.649

FDOT PROJECT MANAGER: RAY HOLZWEISS, P.E.

KEY SHEET REVISIONS

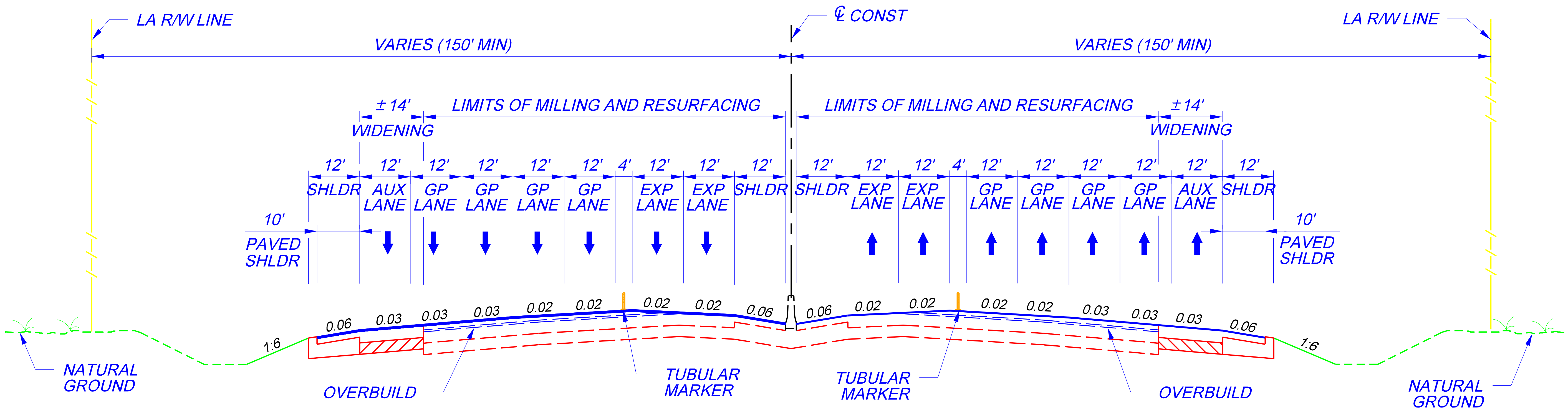
DATE	DESCRIPTION

ROADWAY PLANS
ENGINEER OF RECORD: SILVIA M. BELTRE, P.E.

P.E. NO.: 51295

FISCAL YEAR	SHEET NO.
	1

dachang 6/24/2013 5:24:52 PM V:\2167\active\216700070\B-Engineering\2. Alternative Analysis\Concept Plans\Concept 3\KEYSRD01.dgn



TYPICAL SECTION
FROM STIRLING ROAD (SR 848 MP 5.135) TO I-595 (MP 7.555)
AND FROM NORTH OF THE BROWARD BOULEVARD PARK & RIDE RAMP (MP 10.585)
TO OAKLAND PARK BOULEVARD (SR 816 MP 13.742)

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

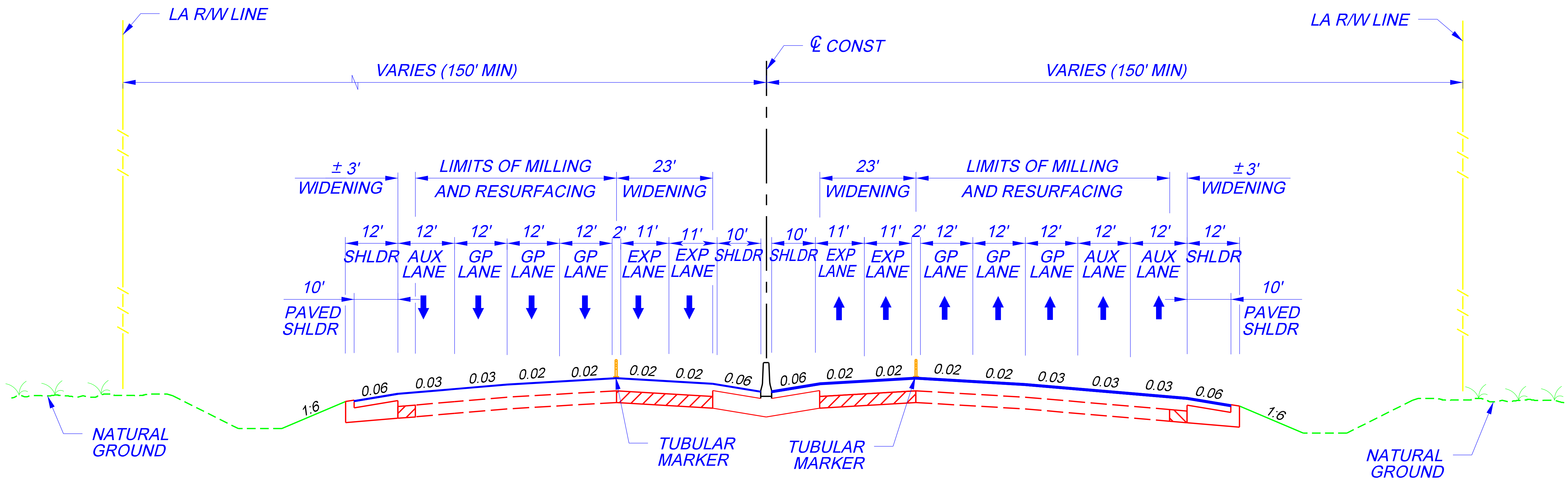
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

TYPICAL SECTIONS

SHEET NO.
2



TYPICAL SECTION
FROM I-595 (MP 7.555) TO
SOUTH OF THE BROWARD BOULEVARD
PARK & RIDE RAMP (MP 9.738)

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

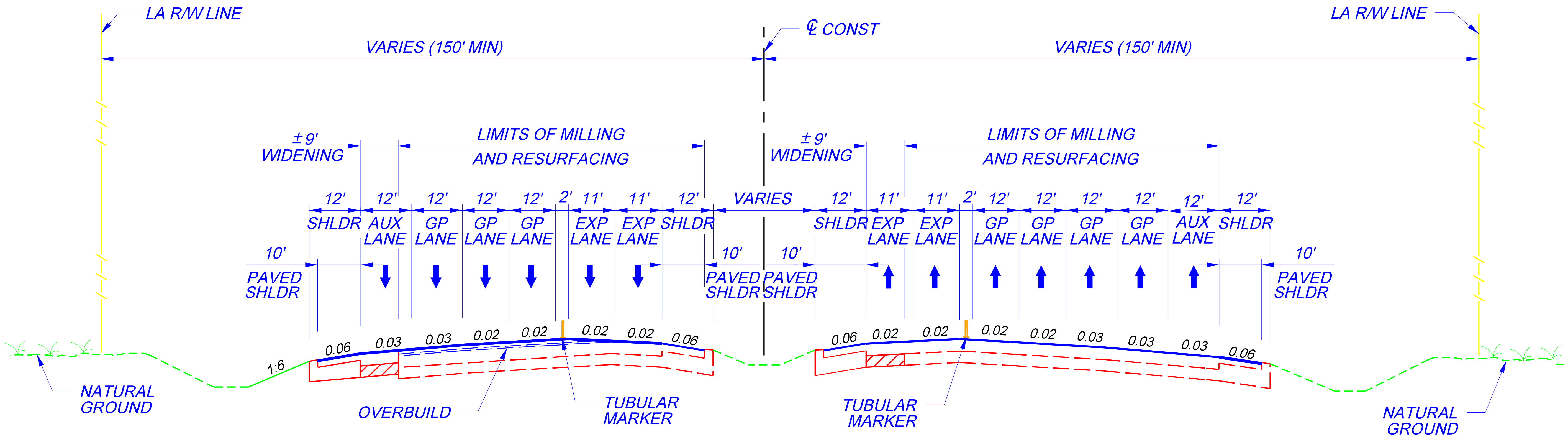
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

TYPICAL SECTIONS

SHEET NO.
3



TYPICAL SECTION
FROM SOUTH OF THE BROWARD BOULEVARD PARK & RIDE RAMP (MP 9.738)
TO NORTH OF THE BROWARD BOULEVARD PARK & RIDE RAMP (MP 10.585)

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

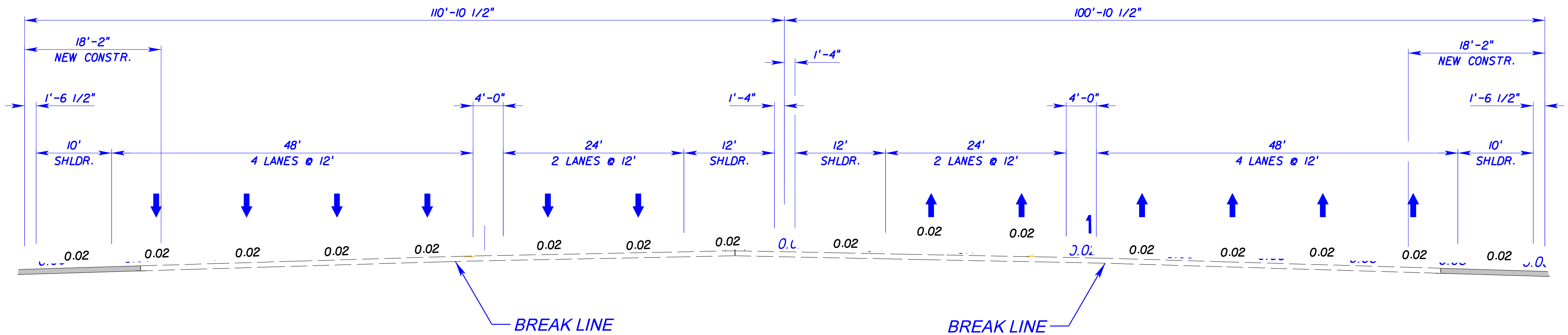
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

TYPICAL SECTIONS

SHEET NO.
4



TYPICAL SECTION
I-95 BRIDGE OVER GRIFFIN ROAD
BRIDGE NO.: 860554 AND 860555

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

TYPICAL SECTIONS

SHEET NO. 5

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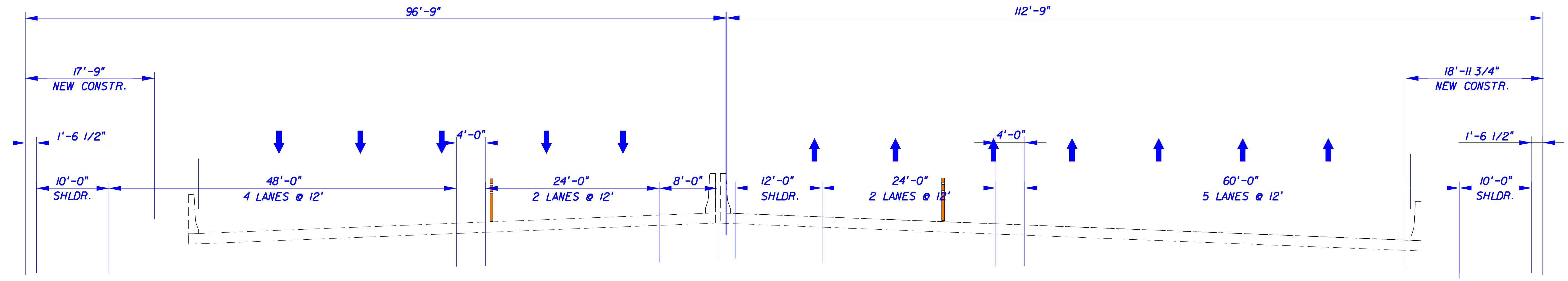

TYPICAL SECTION
I-95 BRIDGE OVER DANIA CUT-OFF CANAL
BRIDGE NO.: 860109 AND 860209

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

TYPICAL SECTIONS

SHEET NO.
6

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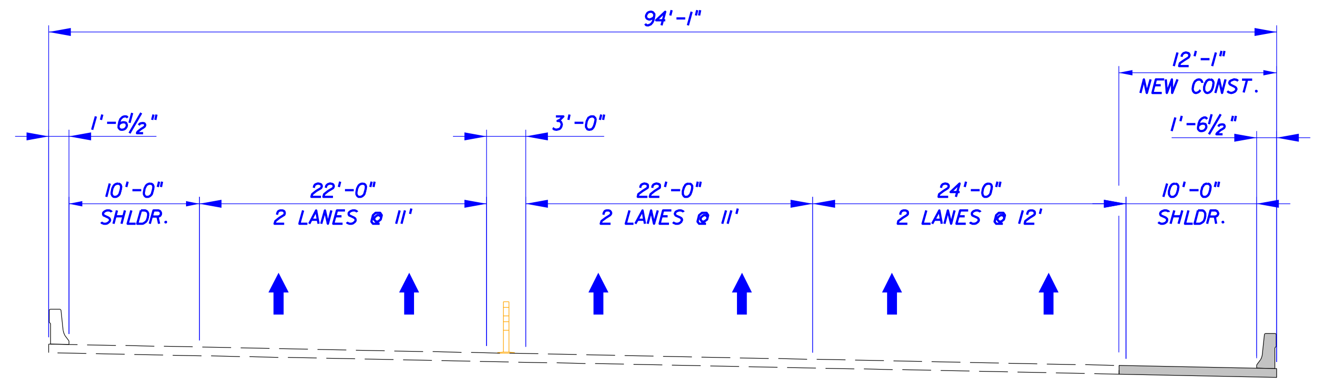
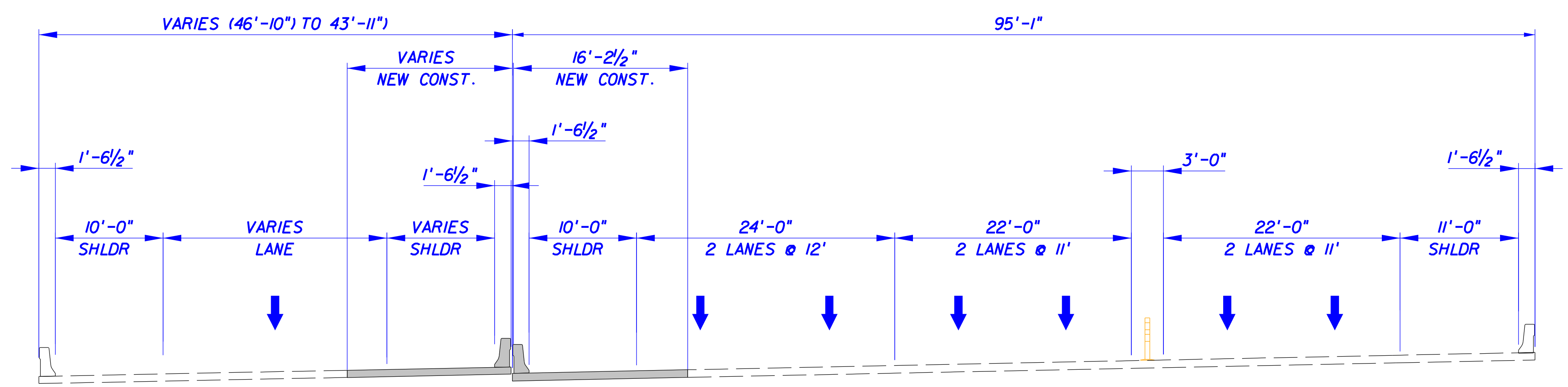


TYPICAL SECTION
NORTHBOUND I-95 BRIDGE OVER NORTH FORK NEW RIVER
BRIDGE NO.: 860271



TYPICAL SECTION
SOUTHBOUND I-95 BRIDGE OVER NORTH FORK NEW RIVER
AND SOUTHBOUND I-95 OFF-RAMP TO BROWARD BOULEVARD
BRIDGE NO.: 860270 AND 860260

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
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901 PONCE DE LEON BLVD., SUITE 900
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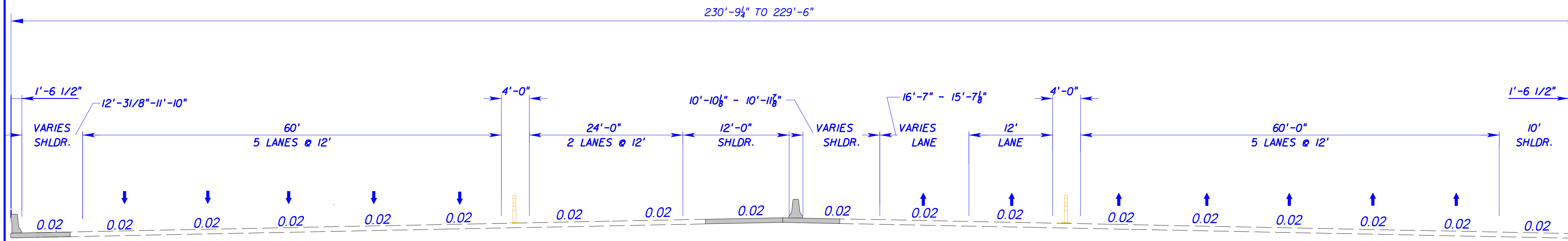
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

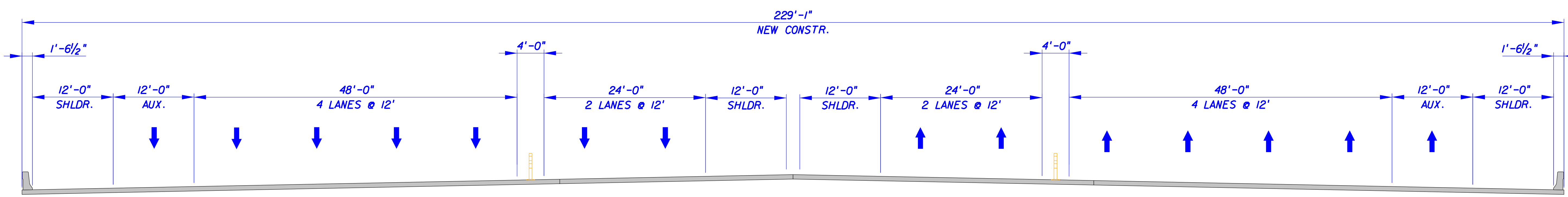
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

TYPICAL SECTIONS

SHEET NO.
7



TYPICAL SECTION
I-95 BRIDGE OVER NW 6 STREET
BRIDGE NO.: 860272 AND 860273



TYPICAL SECTION
I-95 BRIDGE OVER NW 19 STREET
BRIDGE NO.: 860115 AND 860215

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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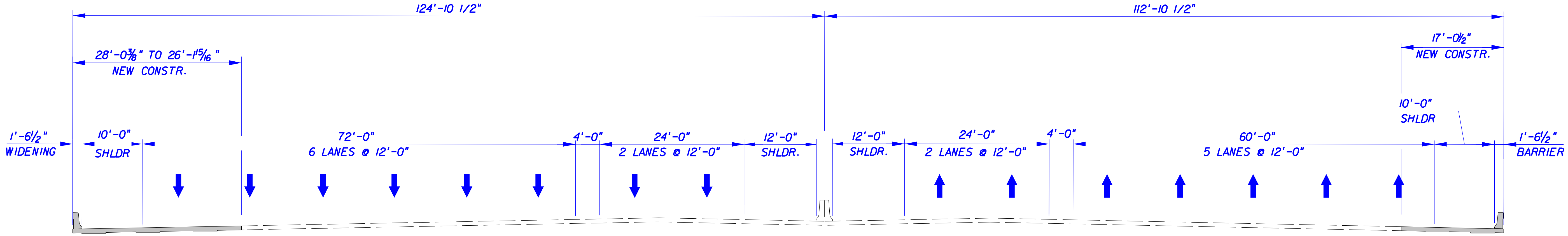
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

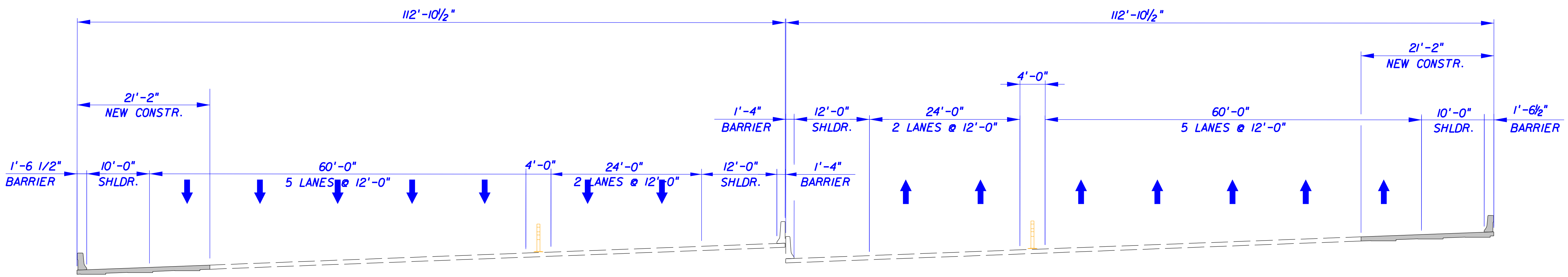
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

TYPICAL SECTIONS

SHEET NO.
8



TYPICAL SECTION
I-95 BRIDGE OVER C-13 CANAL
BRIDGE NO.: 860116 AND 860216



TYPICAL SECTION
I-95 BRIDGE OVER OAKLAND PARK BOULEVARD
BRIDGE NO.: 860117 AND 860217

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
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STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

TYPICAL SECTIONS

SHEET NO.
9

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CURVE DATA CL95-1
PI STA. = 991+63.21
DELTA = 10° 41' 14" (LT)
D = 0° 59' 29"
T = 540.60
L = 1,078.07
R = 5,779.60
PC STA. = 986+22.61
PT STA. = 997+00.67

CURVE DATA CL95-2
PI STA. = 1016+13.84
DELTA = 10° 33' 23" (LT)
D = 0° 59' 29"
T = 533.94
L = 1,064.86
R = 5,779.57
PC STA. = 1010+79.90
PT STA. = 1021+44.76

CURVE DATA CL95-3
PI STA. = 1060+86.81
DELTA = 4° 00' 28" (LT)
D = 0° 12' 00"
T = 1,002.34
L = 2,003.86
R = 28,647.89
PC STA. = 1050+84.47
PT STA. = 1070+88.34

CURVE DATA CL95-4
PI STA. = 1093+28.42
DELTA = 22° 56' 34" (RT)
D = 1° 00' 00"
T = 1,162.71
L = 2,294.27
R = 5,729.57
PC STA. = 1081+65.70
PT STA. = 1104+59.97

CURVE DATA CL95-5
PI STA. = 1121+45.17
DELTA = 4° 40' 01" (LT)
D = 0° 12' 00"
T = 1,167.41
L = 2,333.52
R = 28,648.13
PC STA. = 1109+77.76
PT STA. = 1133+11.29

CURVE DATA CL95-6
PI STA. = 1137+29.34
DELTA = 4° 10' 45" (LT)
D = 0° 30' 00"
T = 418.05
L = 835.74
R = 11,458.06
PC STA. = 1133+11.29
PT STA. = 1141+47.02

CURVE DATA CL95-7
PI STA. = 1152+46.02
DELTA = 3° 24' 42" (RT)
D = 0° 30' 00"
T = 341.25
L = 682.30
R = 11,458.69
PC STA. = 1149+04.77
PT STA. = 1155+87.07

CURVE DATA CL95-8
PI STA. = 1182+08.92
DELTA = 4° 57' 22" (RT)
D = 0° 15' 00"
T = 991.84
L = 1,982.45
R = 22,918.35
PC STA. = 1172+17.07
PT STA. = 1191+99.52

CURVE DATA CL95-14
PI STA. = 1317+39.17
DELTA = 3° 45' 30" (LT)
D = 0° 30' 00"
T = 375.97
L = 751.68
R = 11,459.56
PC STA. = 1313+63.19
PT STA. = 1321+14.87

CURVE DATA CL95-15
PI STA. = 1342+25.63
DELTA = 25° 40' 06" (RT)
D = 1° 15' 00"
T = 1,044.25
L = 2,053.46
R = 4,583.66
PC STA. = 1331+81.37
PT STA. = 1352+34.83

CURVE DATA CL95-16
PI STA. = 1396+69.92
DELTA = 9° 28' 16" (RT)
D = 1° 00' 00"
T = 474.64
L = 947.11
R = 5,729.62
PC STA. = 1391+95.28
PT STA. = 1401+42.40

CURVE DATA CL95-17
PI STA. = 1420+55.02
DELTA = 9° 28' 08" (LT)
D = 1° 00' 00"
T = 474.53
L = 946.90
R = 5,729.59
PC STA. = 1415+80.49
PT STA. = 1425+27.39

CURVE DATA NB_BL-1
PI STA. = 110+37.64
DELTA = 5° 10' 56" (LT)
D = 0° 15' 00"
T = 1,037.64
L = 2,066.61
R = 22,918.31
PC STA. = 100+00.00
PT STA. = 120+73.86

CURVE DATA NB_BL-2
PI STA. = 139+48.20
DELTA = 2° 19' 44" (RT)
D = 0° 14' 20"
T = 487.58
L = 975.03
R = 23,988.00
PC STA. = 134+60.62

CURVE DATA NB_BL-3
PI STA. = 158+48.79
DELTA = 4° 17' 17" (LT)
D = 0° 32' 42"
T = 393.51
L = 437.45
R = 9,152.47
PC STA. = 154+55.29
PT STA. = 162+41.93

CURVE DATA NB_BL-4
PI STA. = 173+60.74
DELTA = 3° 03' 17" (LT)
D = 0° 32' 42"
T = 280.26
L = 563.62
R = 35,000.00
PC STA. = 170+80.48
PT STA. = 176+40.87

CURVE DATA NB_BL-5
PI STA. = 183+54.77
DELTA = 6° 48' 55" (RT)
D = 0° 28' 40"
T = 713.90
L = 1,477.21
R = 11,402.13
PC STA. = 176+40.87
PT STA. = 190+66.98

CURVE DATA SB_BL-1
PI STA. = 326+24.47
DELTA = 7° 07' 54" (LT)
D = 0° 22' 51"
T = 937.74
L = 1,618.62
R = 15,059.00
PC STA. = 316+86.74
PT STA. = 335+59.79

CURVE DATA SB_BL-2
PI STA. = 341+60.63
DELTA = 7° 37' 52" (RT)
D = 0° 38' 10"
T = 600.84
L = 1,194.58
R = 11,459.15
PC STA. = 335+59.79
PT STA. = 347+59.70

CURVE DATA SB_BL-3
PI STA. = 364+60.83
DELTA = 8° 29' 49" (LT)
D = 1° 15' 10"
T = 339.71
L = 679.80
R = 4,063.89
PC STA. = 361+21.12
PT STA. = 367+99.29

CURVE DATA SB_BL-4
PI STA. = 383+90.26
DELTA = 5° 31' 55" (RT)
D = 1° 08' 27"
T = 242.62
L = 482.74
R = 6,000.00
PC STA. = 381+47.64
PT STA. = 386+32.51

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

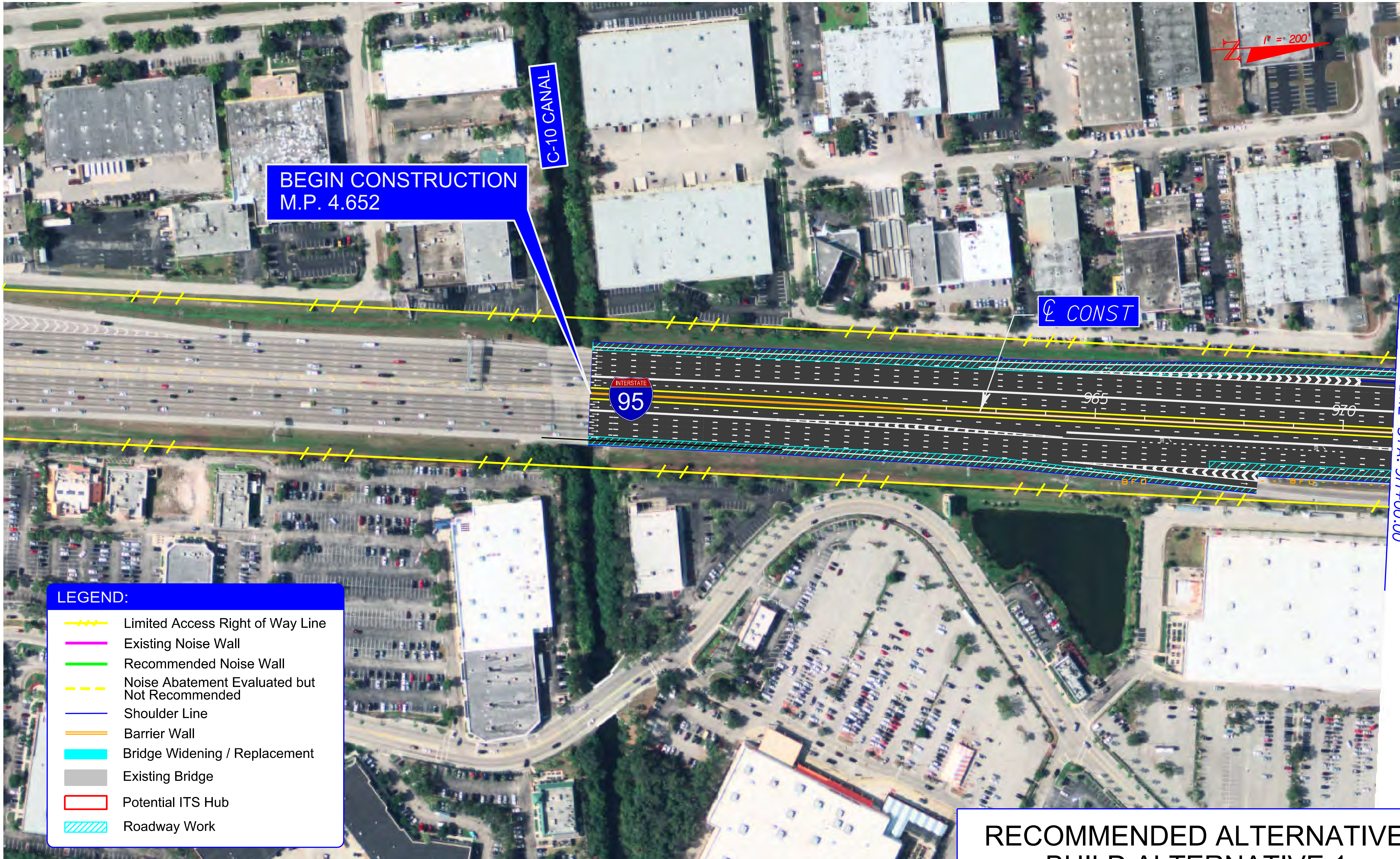
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

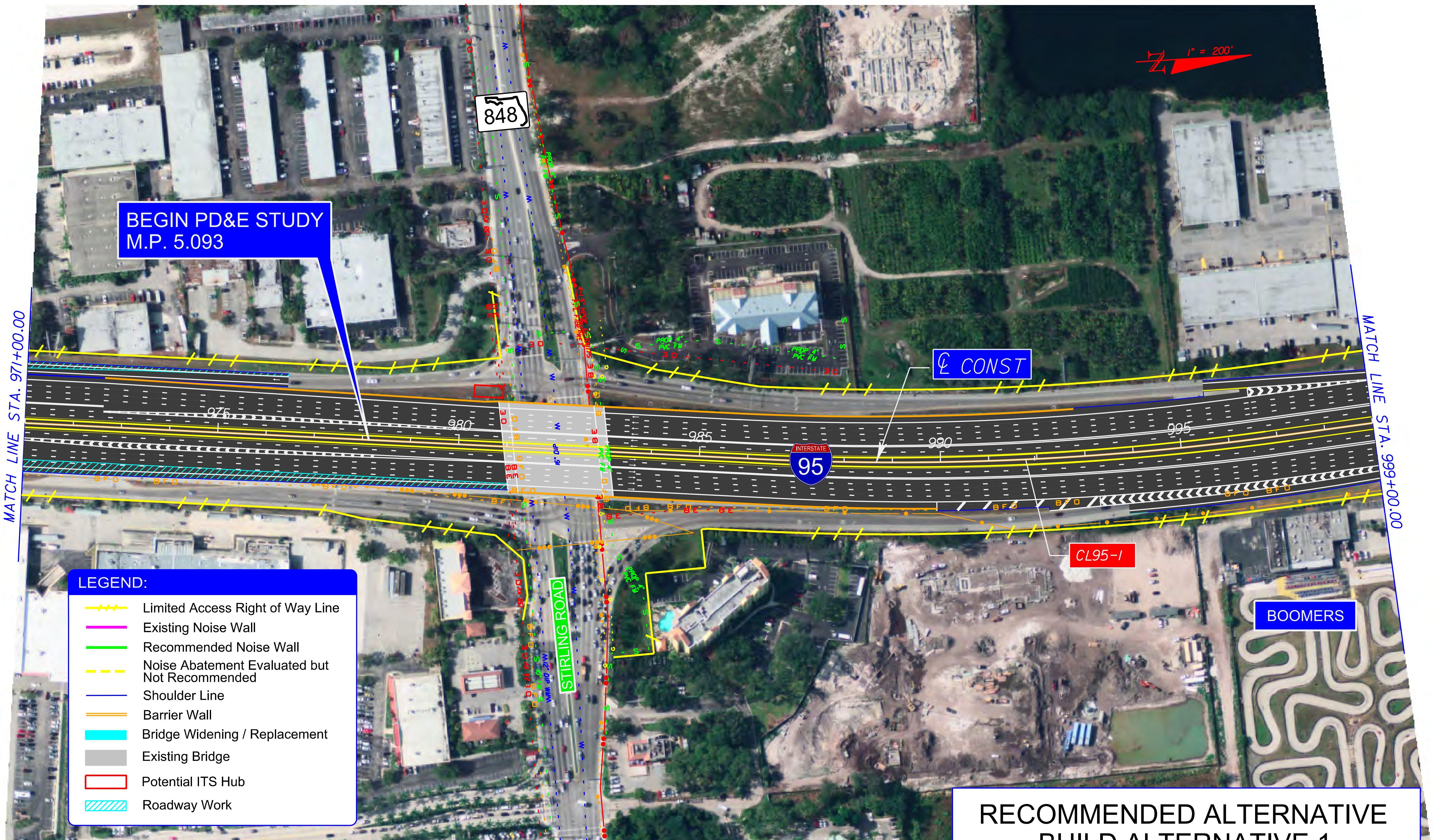
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

CURVE DATA



RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS					STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	SILVIA M. BELTRE, P.E. P.E. LICENSE NUMBER 51295 STANTEC CONSULTING SERVICES, INC. 901 PONCE DE LEON BLVD., SUITE 900 CORAL GABLES, FLORIDA 33134 CERTIFICATE OF AUTHORIZATION 00027013	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	PRELIMINARY CONCEPT PLANS	
					SR-9	BROWARD	429804-1-22-01		11



RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
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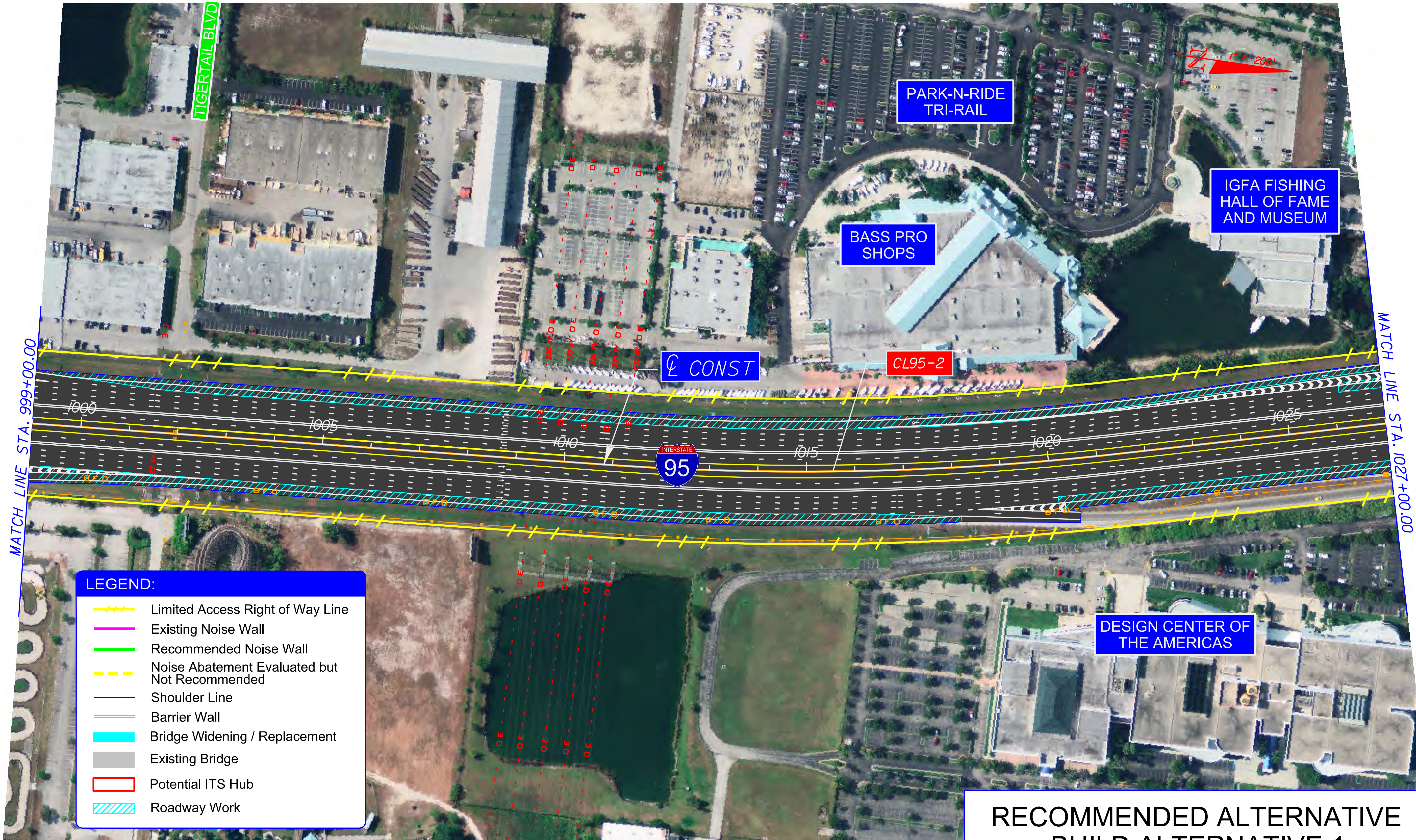
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 12



RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
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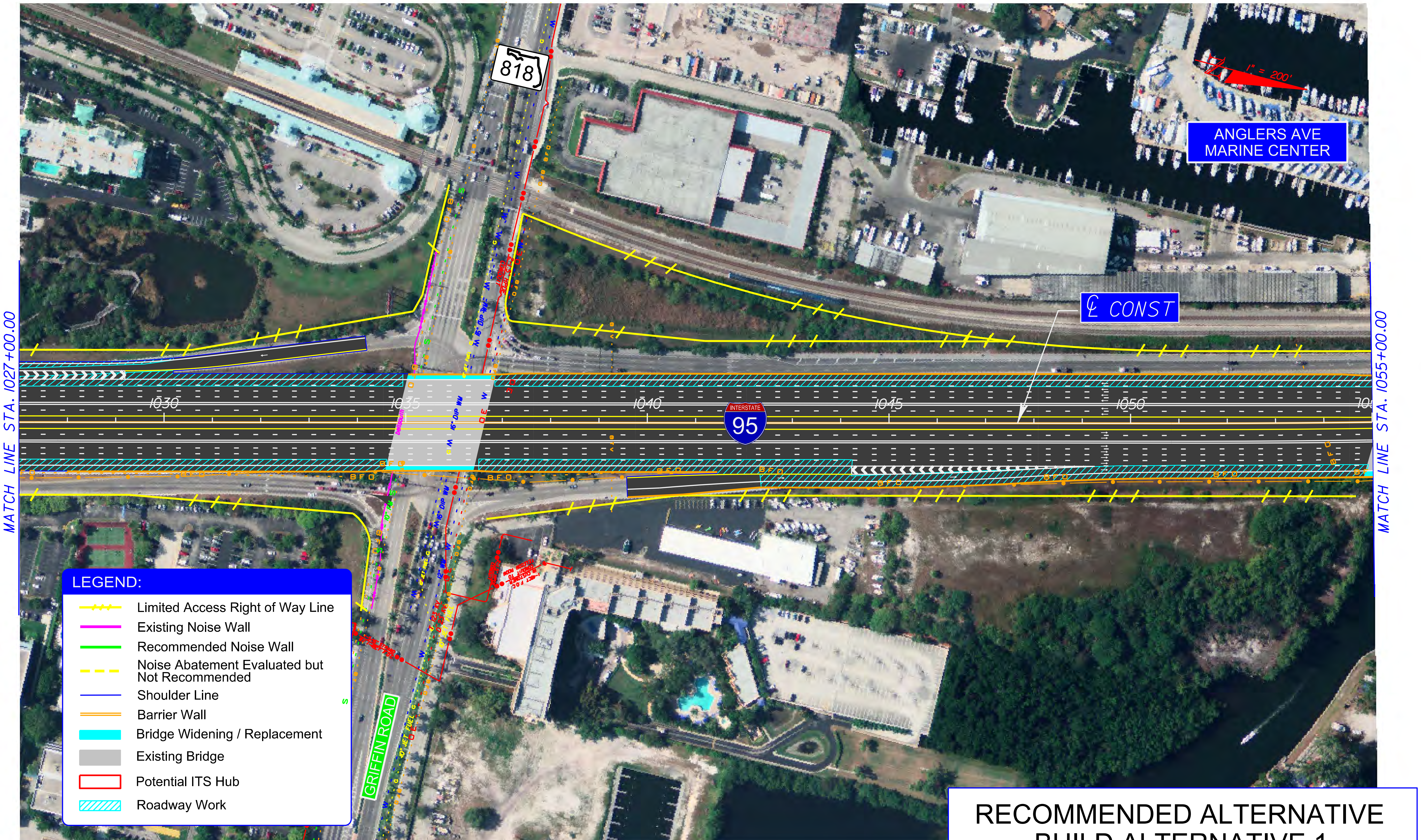
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 13



RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 14

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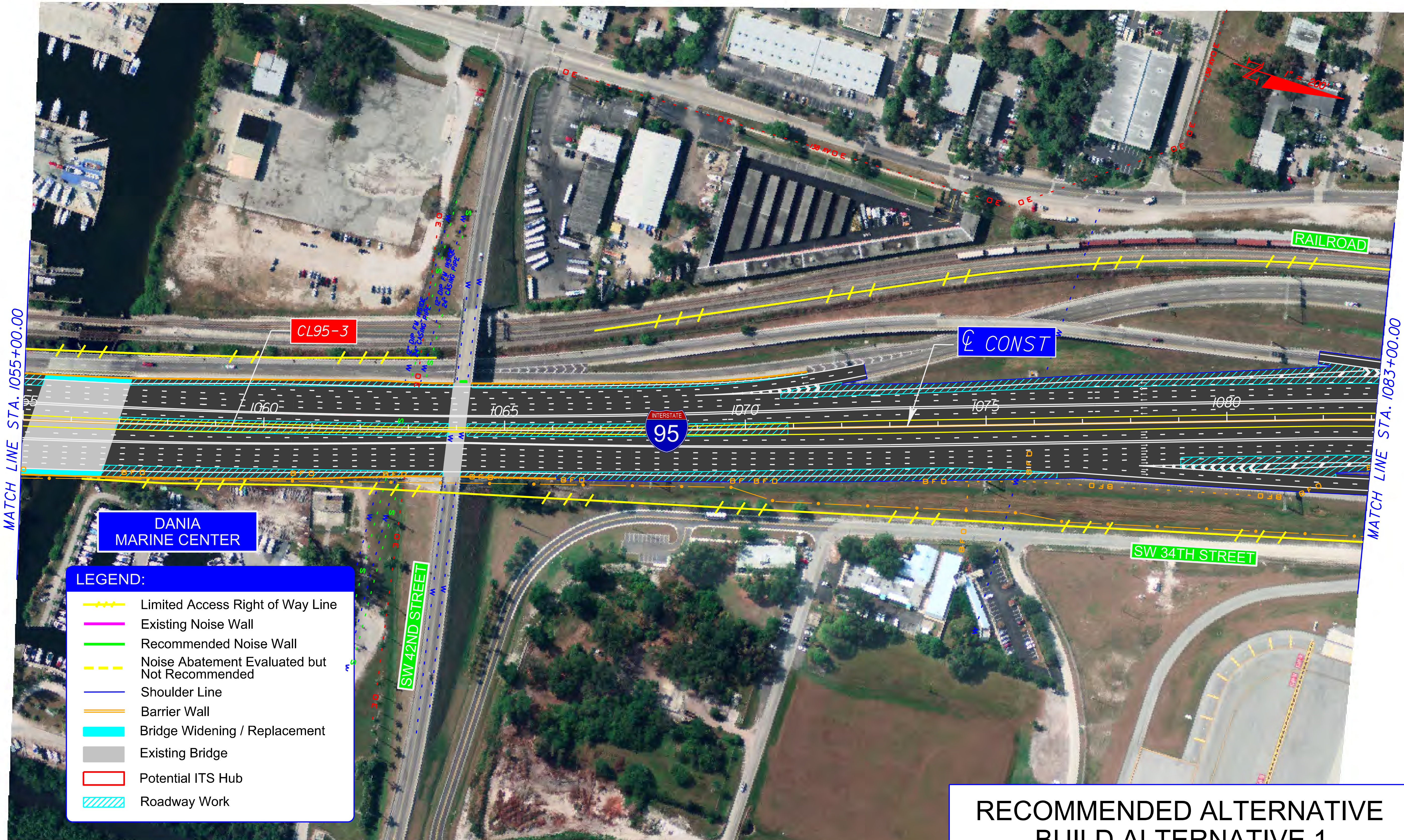

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 15

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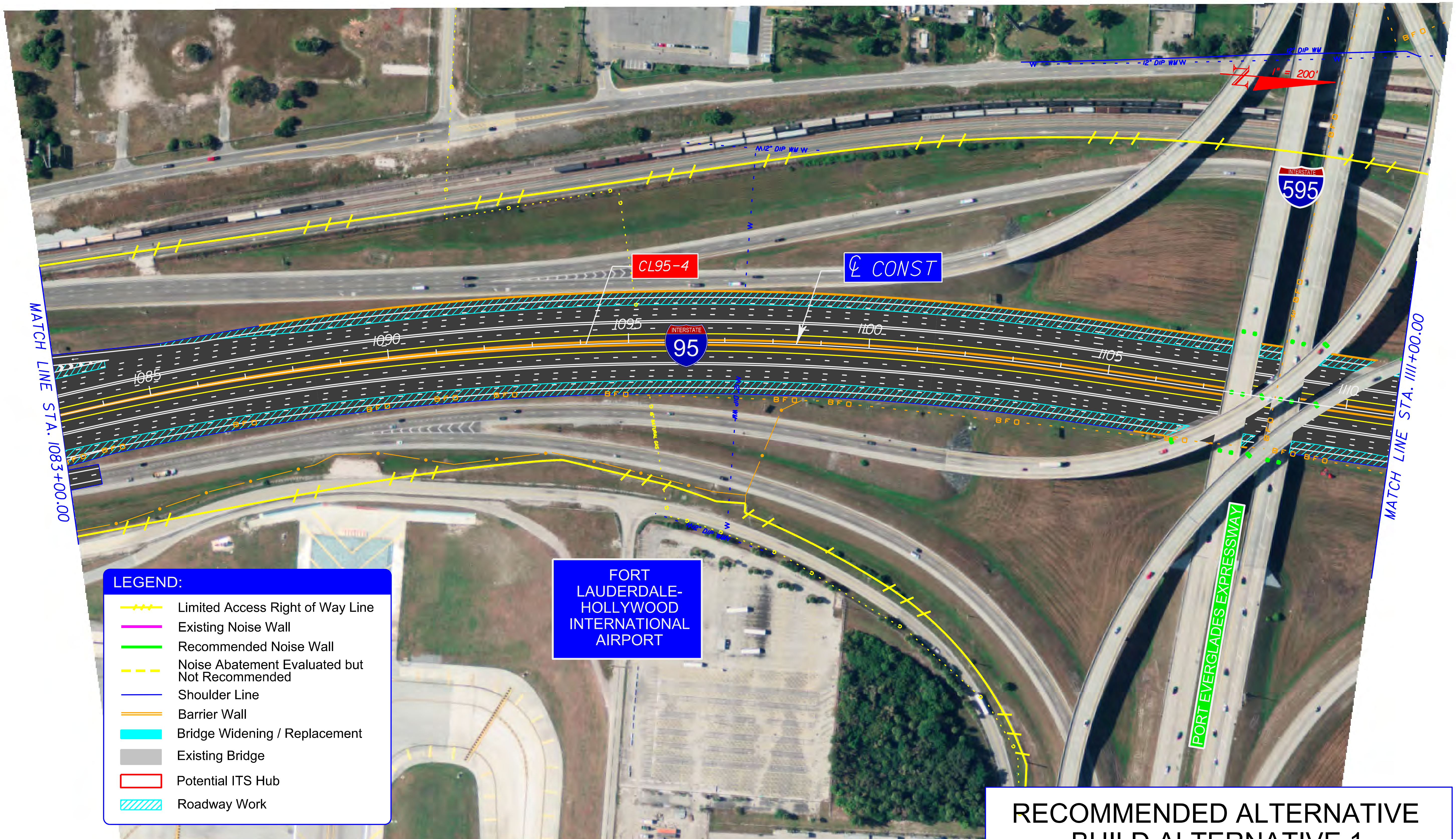

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 16

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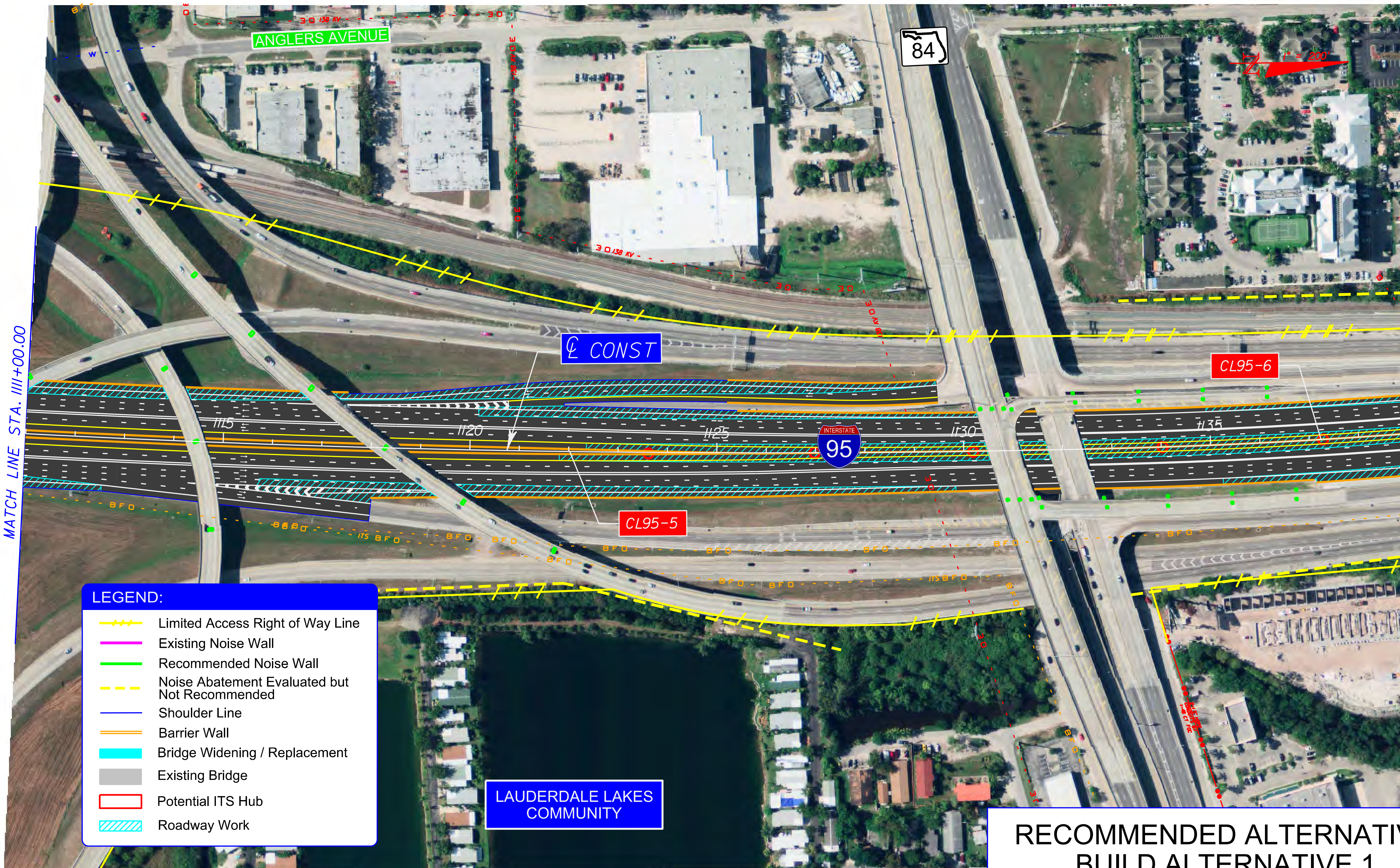

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO.
17

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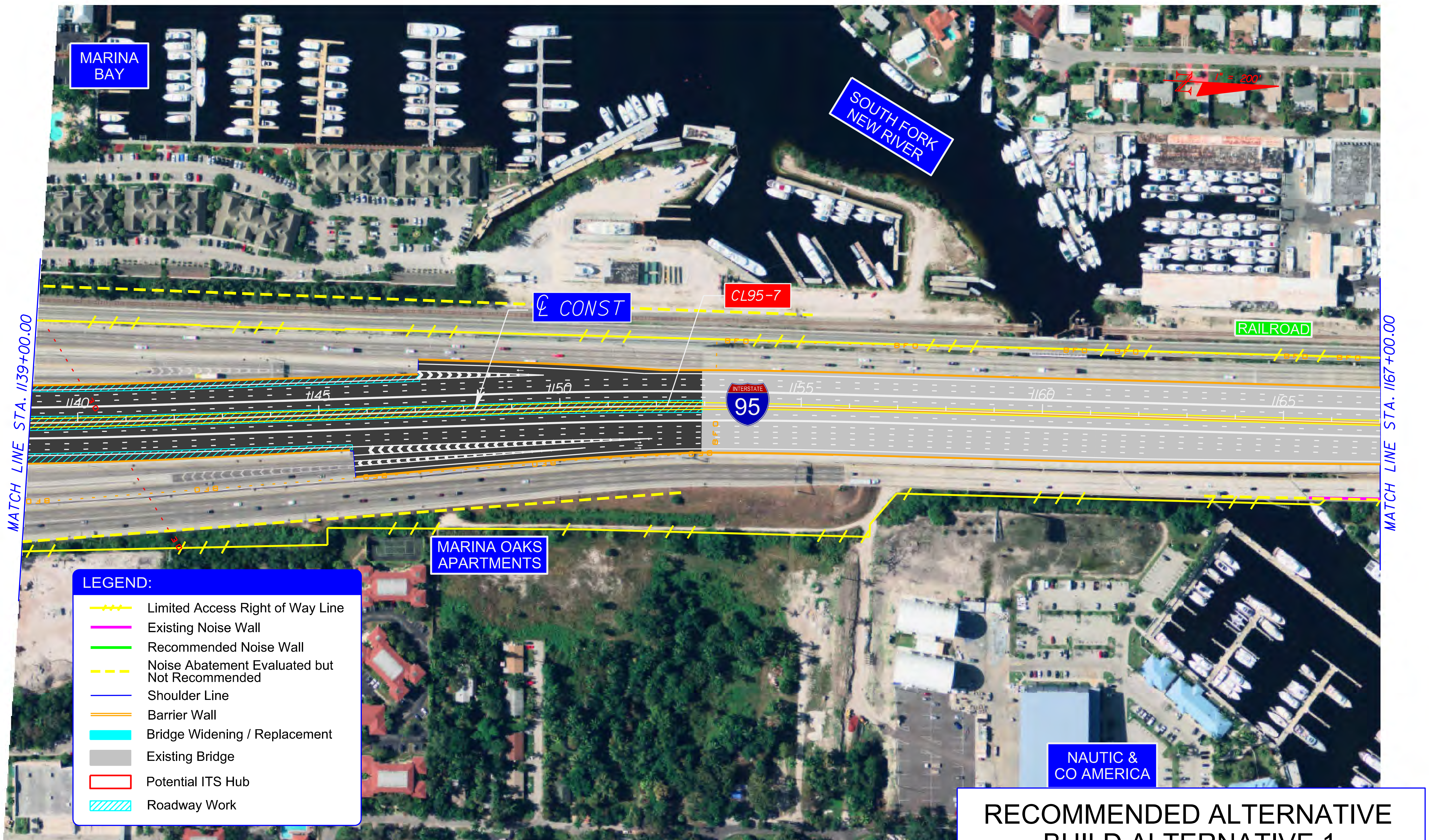

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 18

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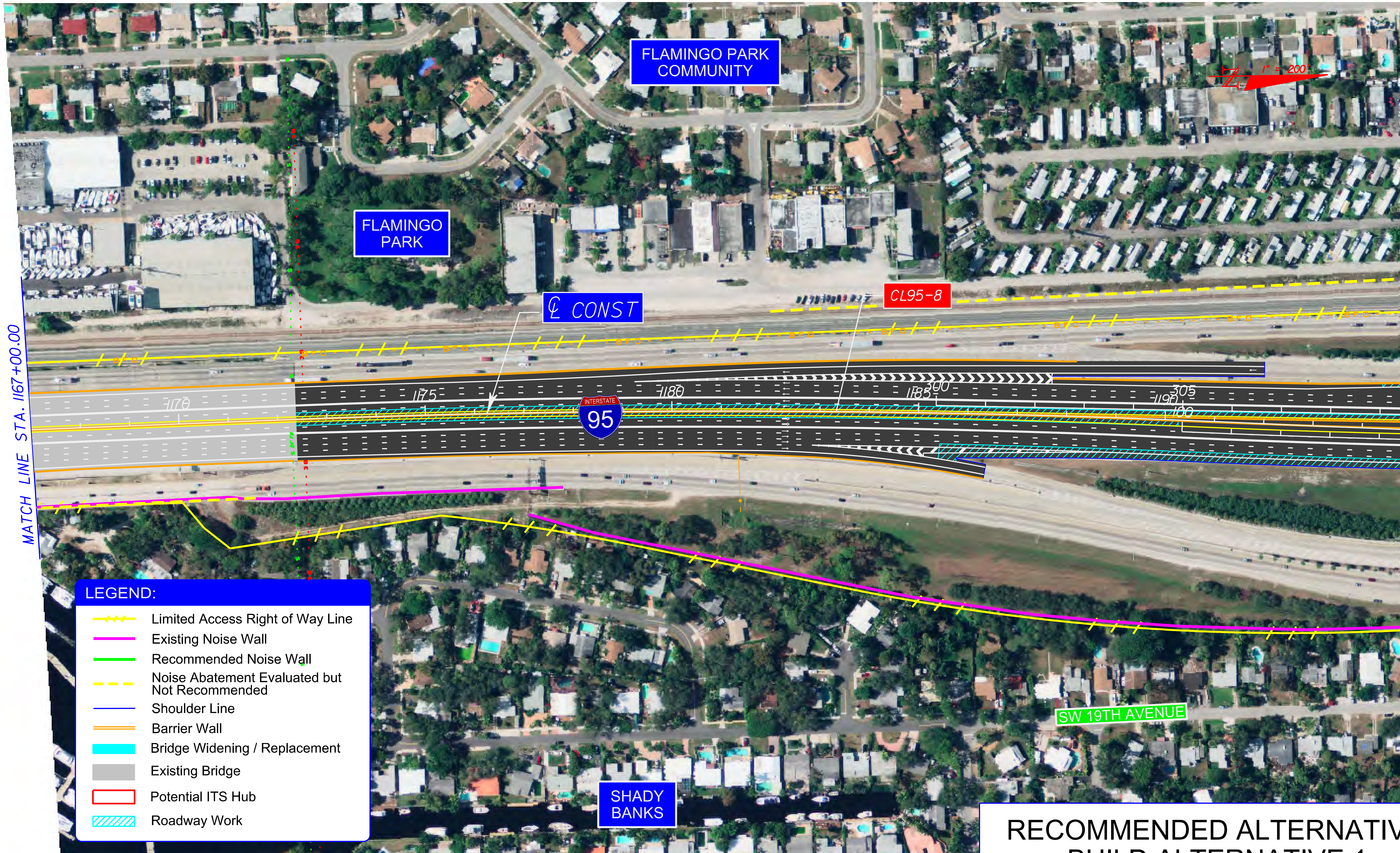

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
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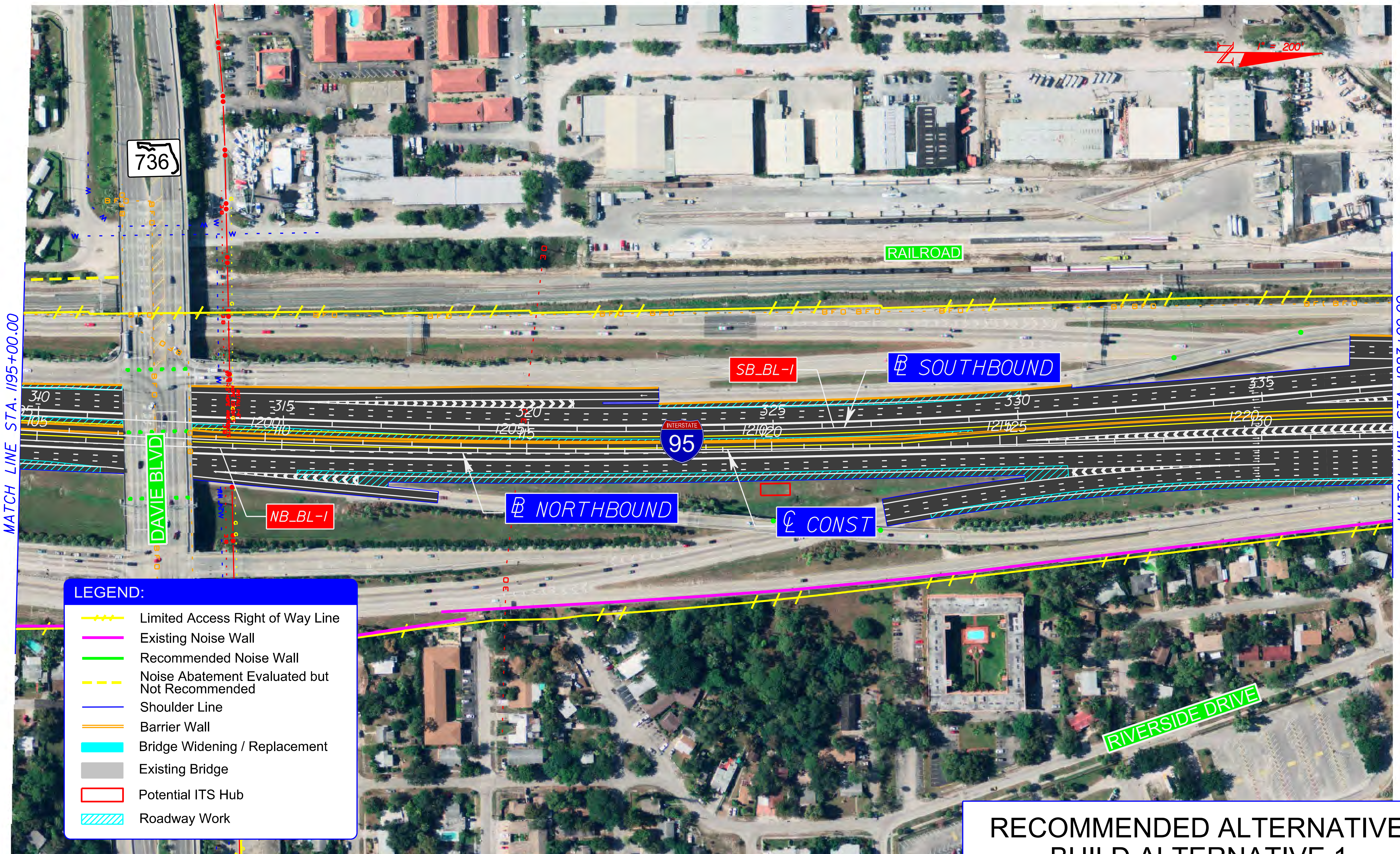
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 19



RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 20

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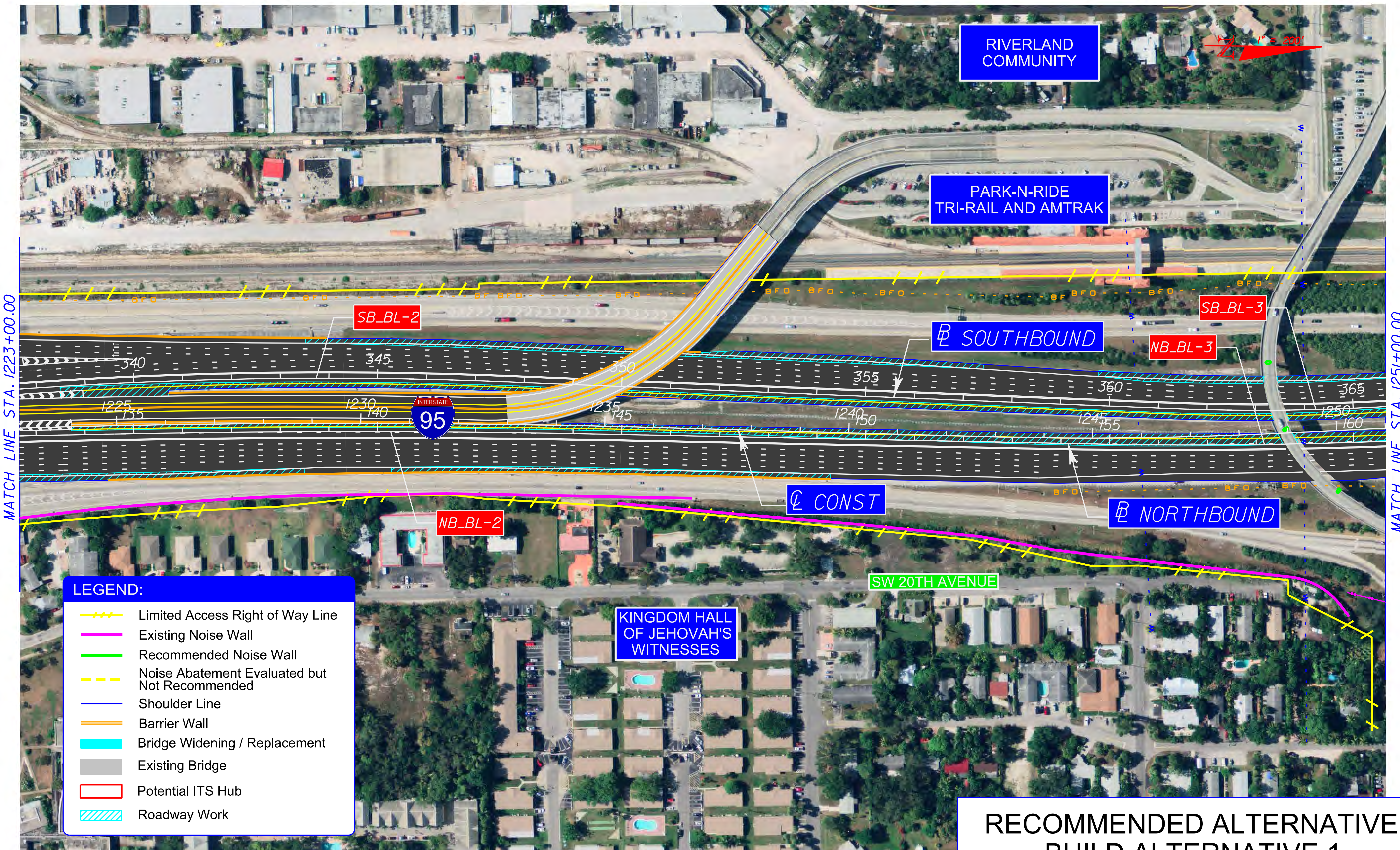

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
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STATE OF FLORIDA
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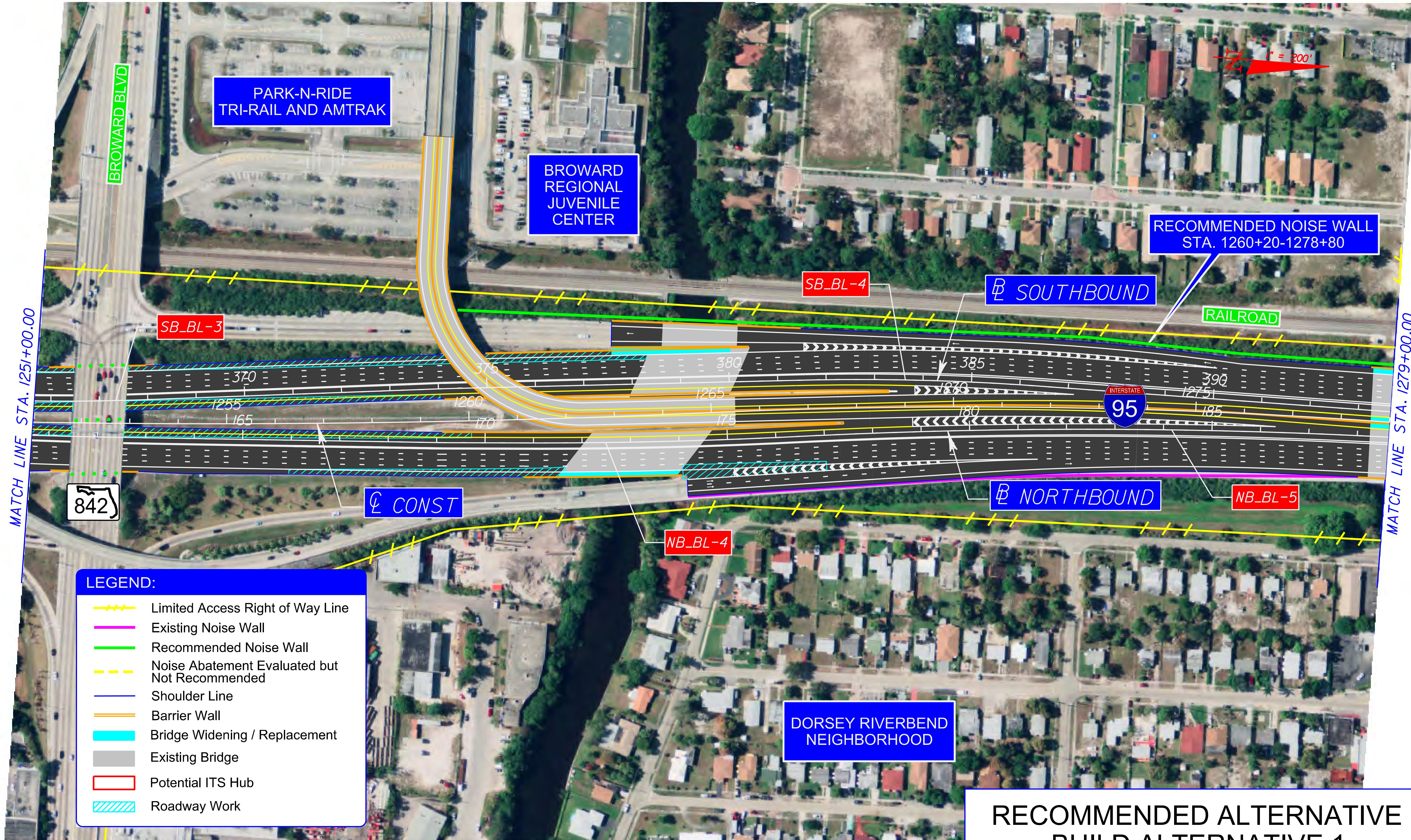
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 21



RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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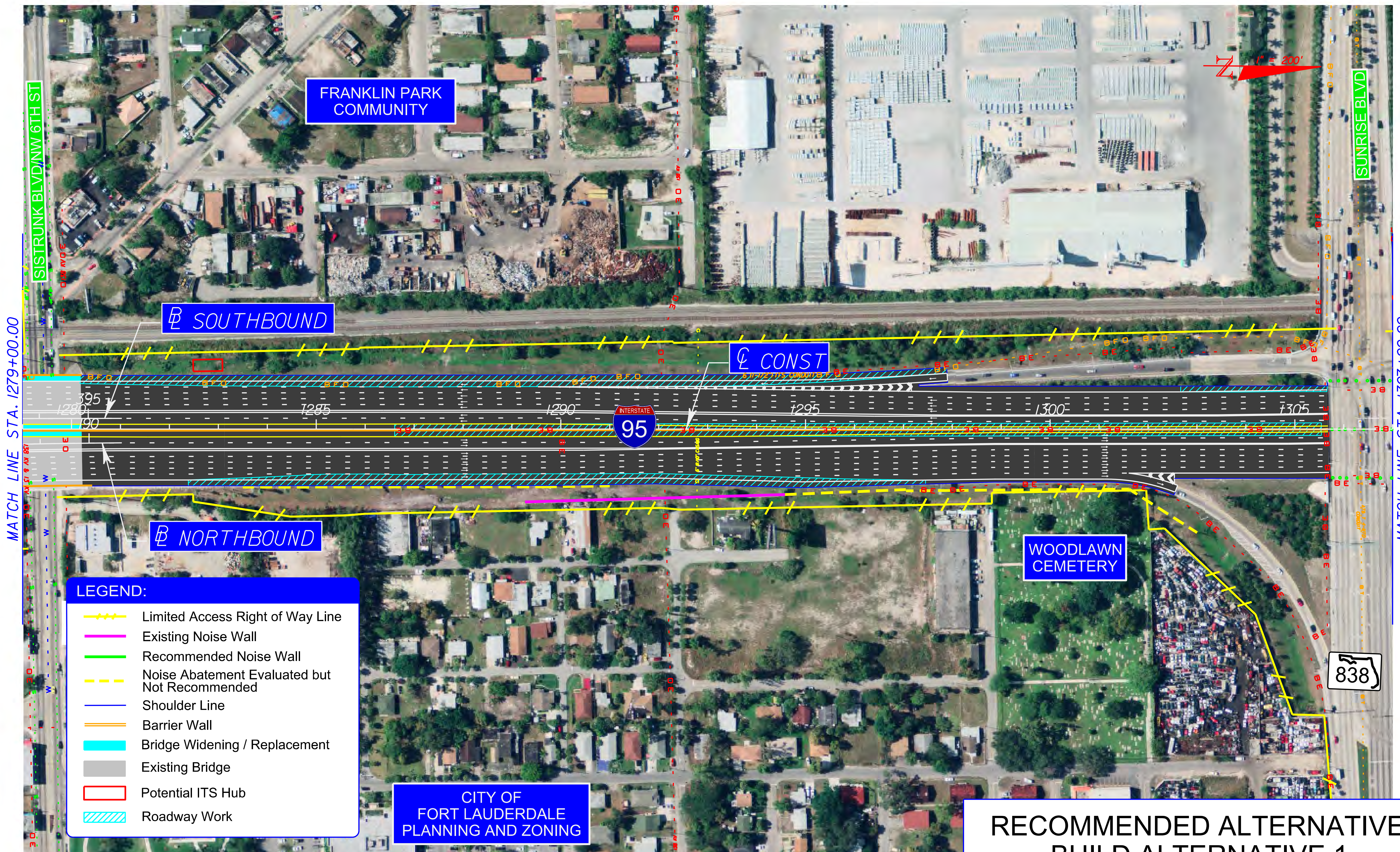
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 22



RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 23

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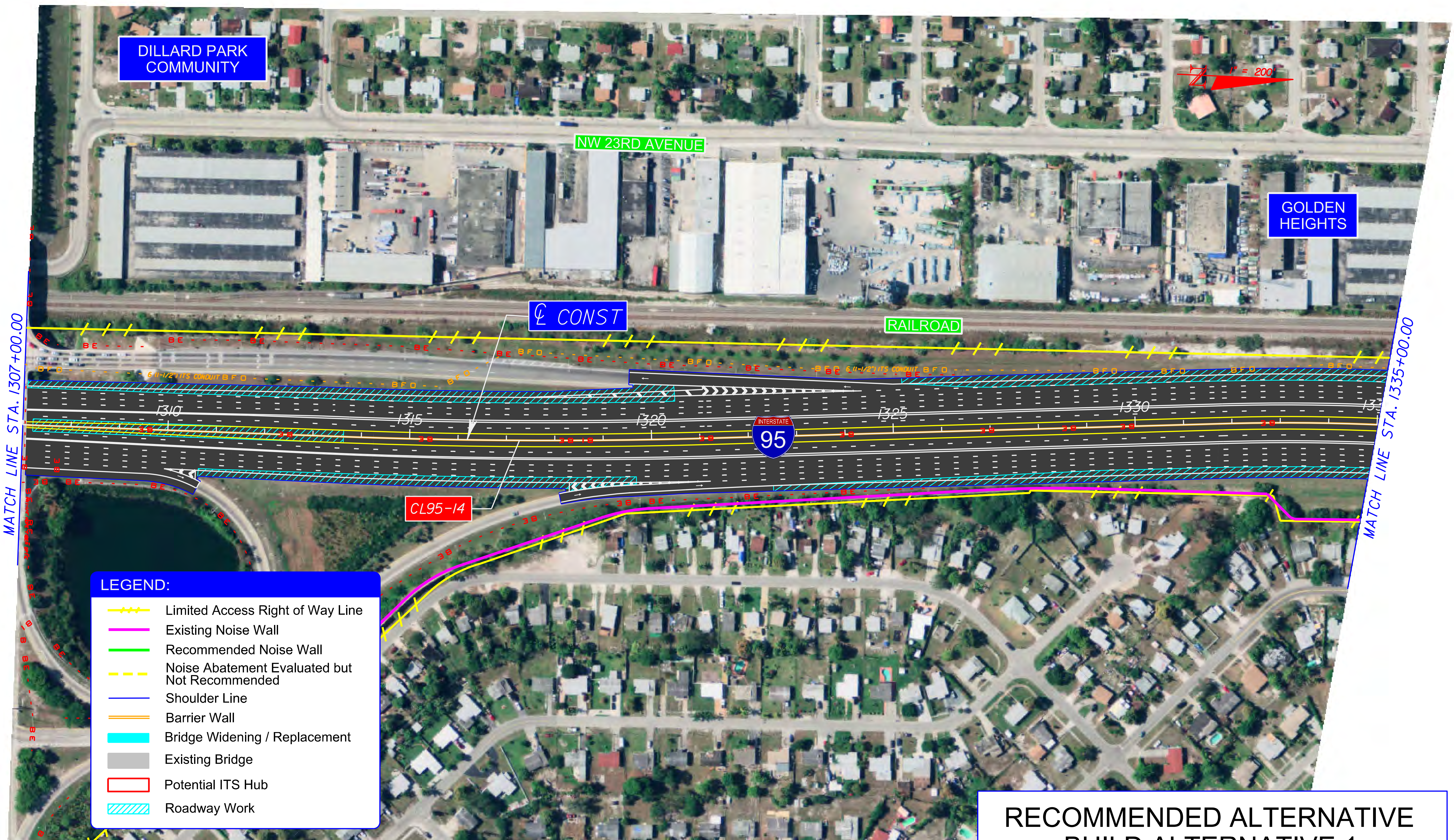


RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

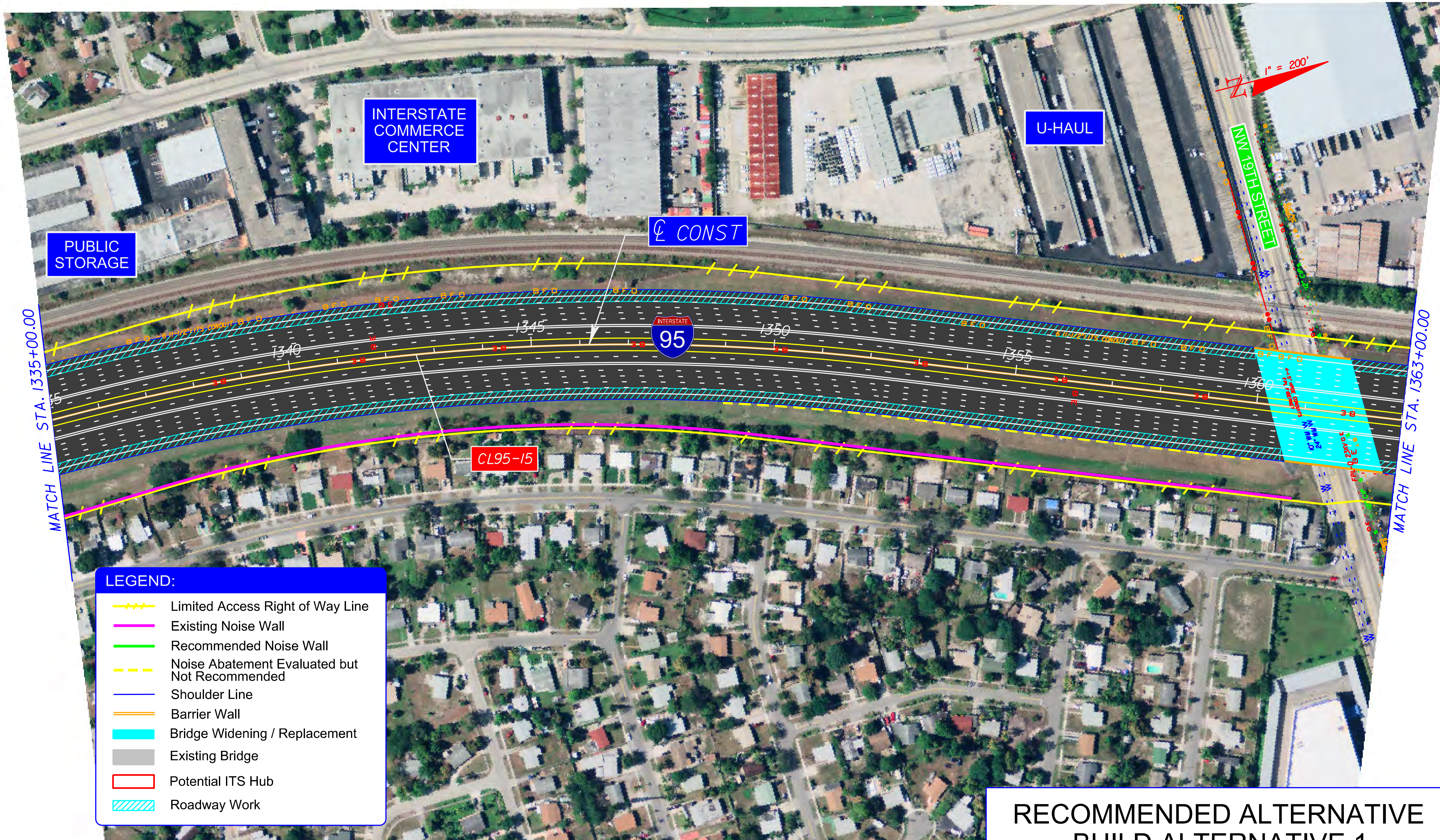
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY
CONCEPT PLANS

SHEET NO.
24

dachang 6/24/2013 5:14:59 PM V:\2167\active\216700070\B-Engineering\2. Alternative Analysis\Concept Plans\Concept 3\PLANRDI3



LEGEND:

- Limited Access Right of Way Line
- Existing Noise Wall
- Recommended Noise Wall
- Noise Abatement Evaluated but Not Recommended
- Shoulder Line
- Barrier Wall
- Bridge Widening / Replacement
- Existing Bridge
- Potential ITS Hub
- Roadway Work

RECOMMENDED ALTERNATIVE BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

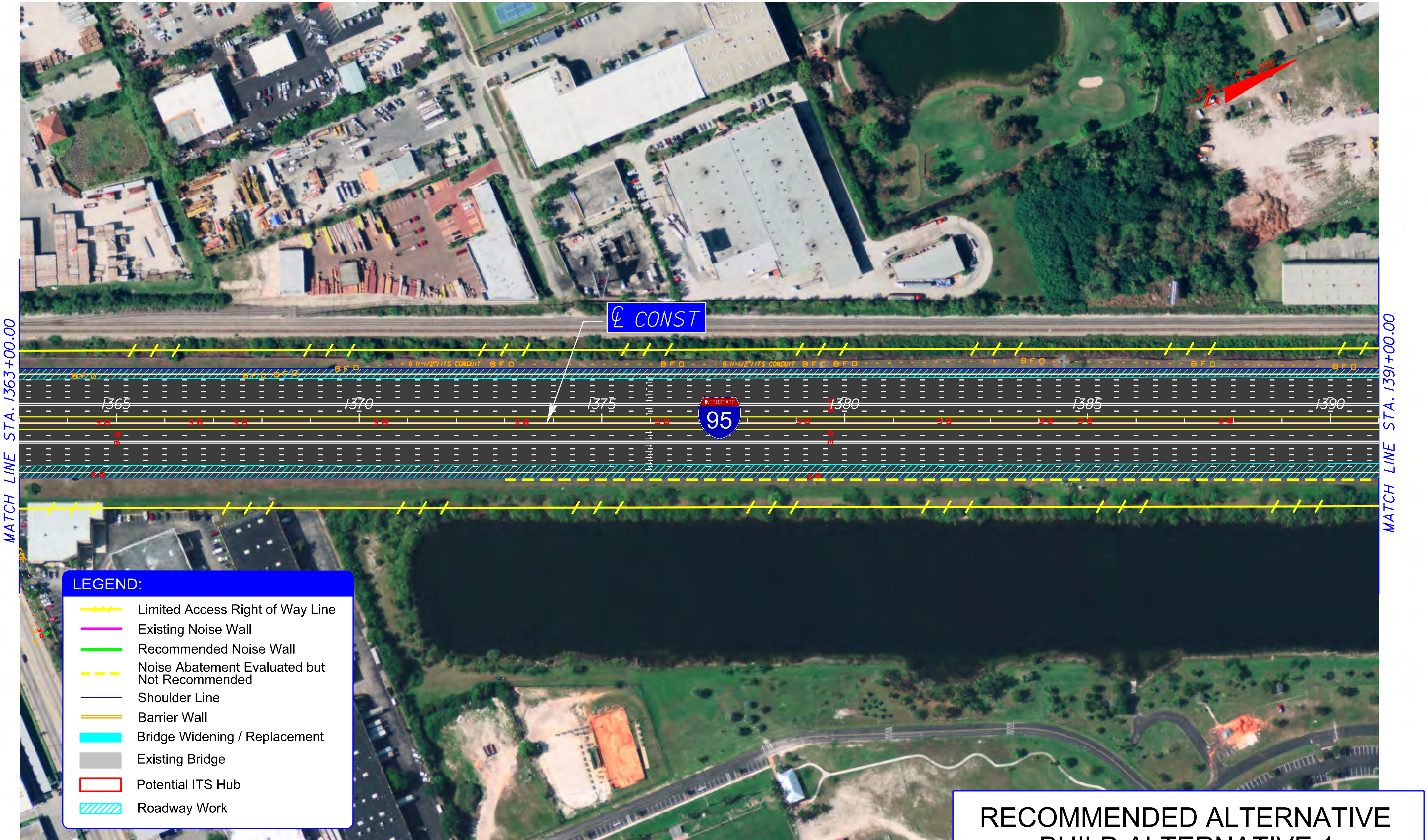
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 25



RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

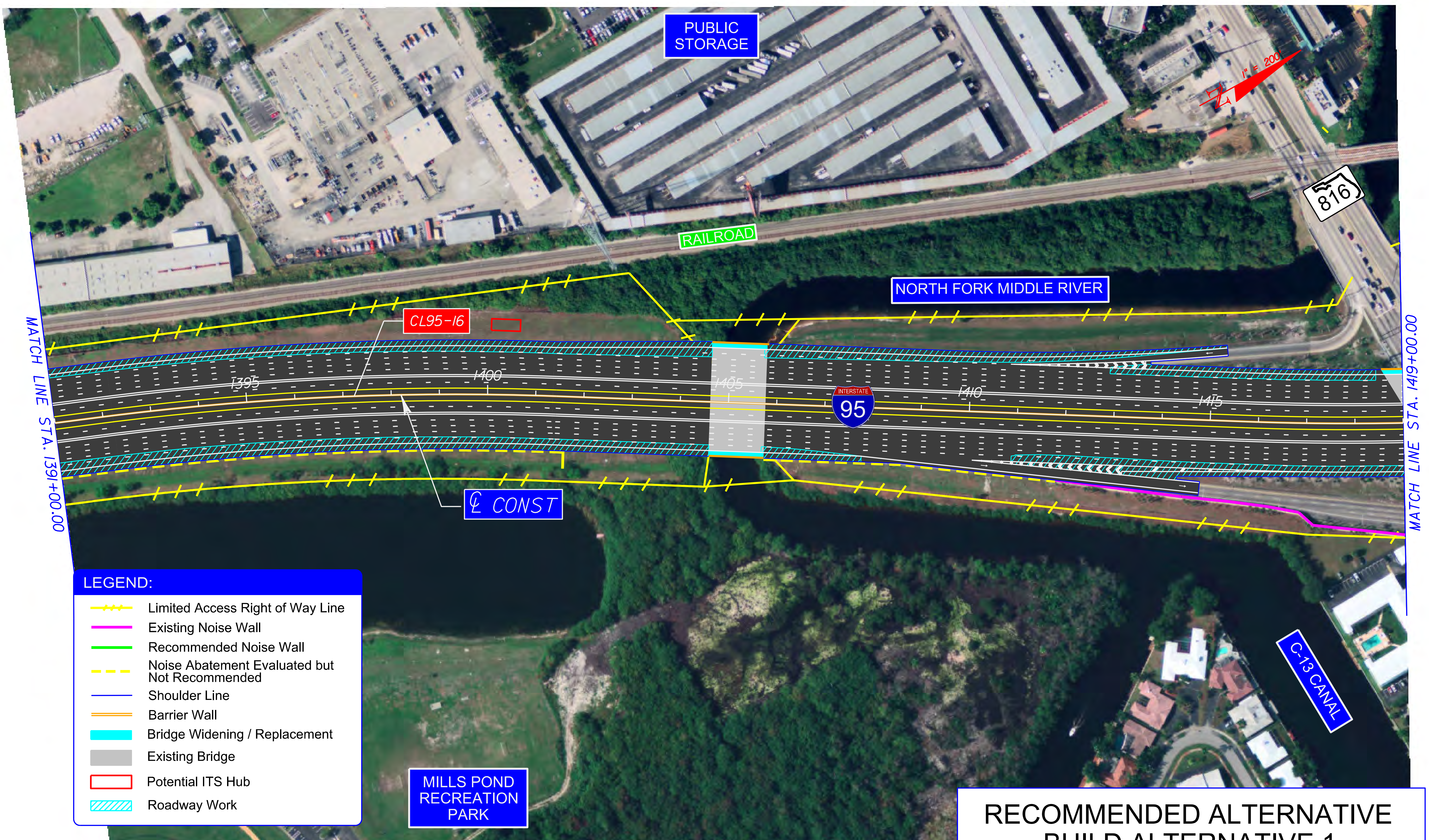
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO.
26

dachang 6/24/2013 5:15:08 PM



RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

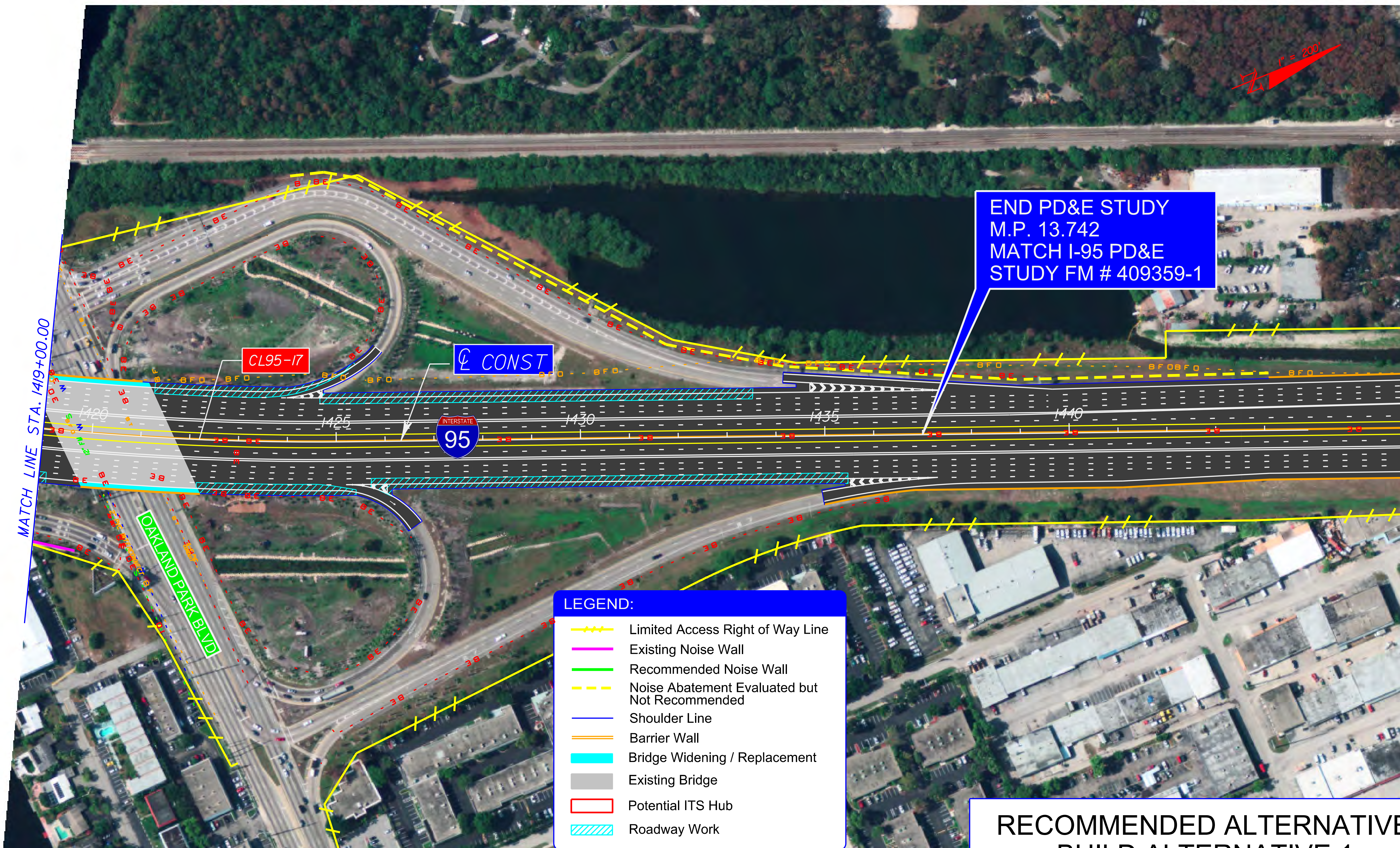
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 27

dachang 6/24/2013 5:15:13 PM V:\2167\active\216700070\B-Engineering\2. Alternative Analysis\Concept Plans\Concept 3\PLANRDI6.



RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

PRELIMINARY CONCEPT PLANS

SHEET NO. 28

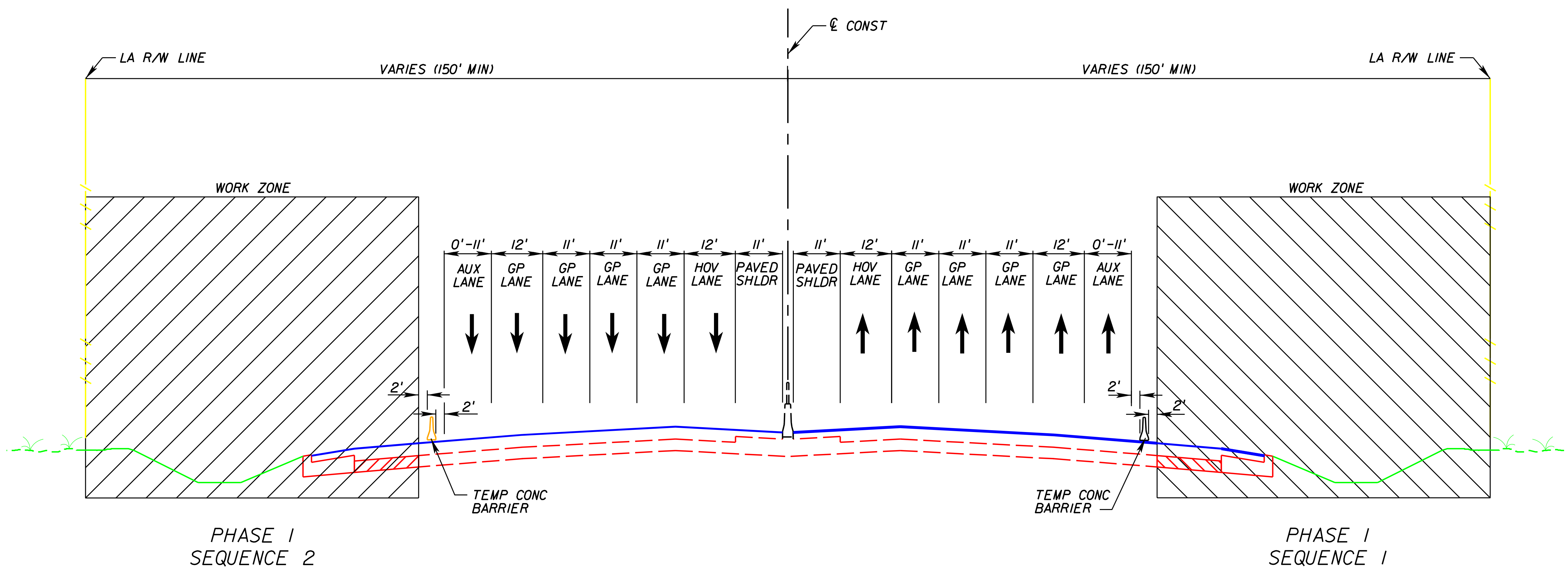
NOTES:
ROADWAY CONSTRUCTION FOR THIS SEGMENT SHALL BE ACCOMPLISHED IN 2 PHASES. MOT FOR WIDENING OF THE BRIDGES WITHIN THIS SEGMENT SHALL BE CONSISTENT WITH THE ROADWAY CONSTRUCTION SEQUENCE TO MINIMIZE TRAFFIC DISRUPTIONS.

PHASE 1

1. SHOWN HERE.
2. PROVIDE TEMPORARY CONCRETE BARRIER WALL.
3. WIDEN TO THE OUTSIDE IN 2 SEQUENCES (NORTHBOUND AND SOUTHBOUND).

PHASE 2

1. NOT SHOWN HERE.
2. MILLING AND RESURFACING AS PER FDOT INDEX 600'S SERIES.



TYPICAL SECTION
FROM STIRLING ROAD TO SR 84
AND FROM NORTH OF PARK & RIDE TO OAKLAND PARK BLVD

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

TRAFFIC CONTROL PLANS

SHEET NO.
29

NOTES:
ROADWAY CONSTRUCTION FOR THIS SEGMENT SHALL BE ACCOMPLISHED IN 3 PHASES.

PHASE 1

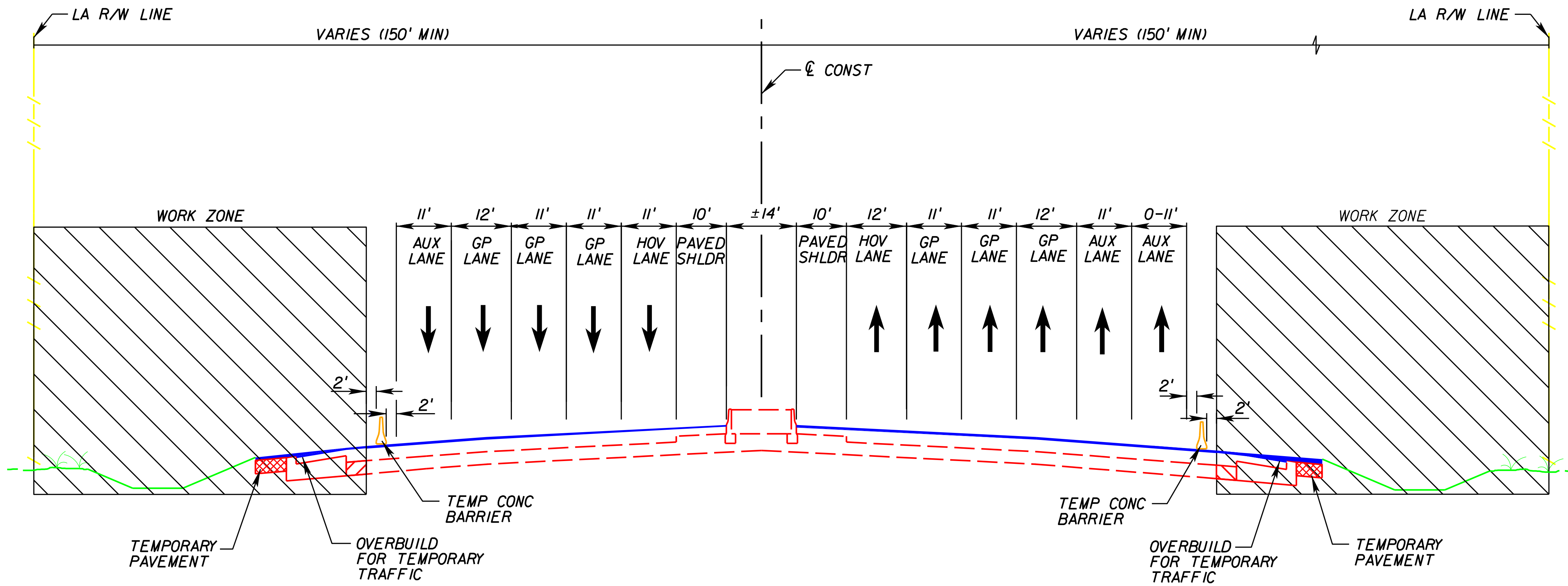
1. SHOWN HERE.
2. PROVIDE TEMPORARY CONCRETE BARRIER WALL.
3. WIDEN TO THE OUTSIDE IN 2 SEQUENCES (NORTHBOUND AND SOUTHBOUND).

PHASE 2

1. NOT SHOWN HERE (SEE NEXT SHEET).

PHASE 3

1. NOT SHOWN HERE.
2. MILLING AND RESURFACING AS PER FDOT 600'S SERIES.



PHASE 1
SEQUENCE 2

PHASE 1
SEQUENCE 1

TYPICAL SECTION
FROM SR 84 TO SOUTH OF PARK & RIDE

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

TRAFFIC CONTROL PLANS

SHEET NO.
30

dachang 6/24/2013 5:15:23 PM V:\2167\active\216700070\B-Engineering\2. Alternative Analysis\Concept Plans\Concept 3\

NOTES:
ROADWAY CONSTRUCTION FOR THIS SEGMENT SHALL BE ACCOMPLISHED IN 3 PHASES.

PHASE 1

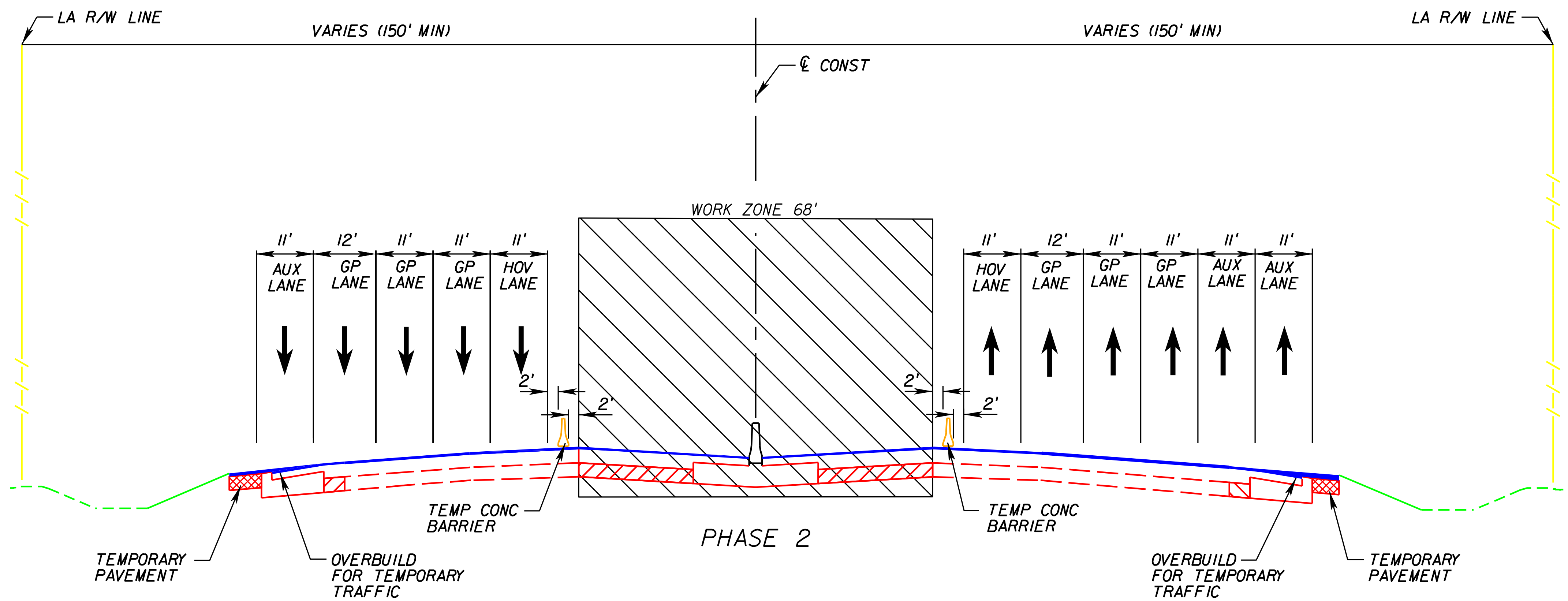
1. NOT SHOWN HERE (SEE PREVIOUS SHEET).

PHASE 2

1. SHOWN HERE.
2. PROVIDE TEMPORARY CONCRETE BARRIER WALL.
3. REMOVE EXISTING CONCRETE MEDIAN.
4. WIDEN TO THE INSIDE.

PHASE 3

1. NOT SHOWN HERE.
2. MILLING AND RESURFACING AS PER FDOT 600'S SERIES.



TYPICAL SECTION
FROM SR 84 TO SOUTH OF PARK & RIDE

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

TRAFFIC CONTROL PLANS

SHEET NO.
31

dachang 6/24/2013 5:15:23 PM V:\2167\active\216700070\B-Engineering\2. Alternative Analysis\Concept Plans\Concept 3

NOTES:
ROADWAY CONSTRUCTION FOR THIS SEGMENT SHALL BE ACCOMPLISHED IN 2 PHASES. MOT FOR WIDENING OF THE BRIDGES WITHIN THIS SEGMENT SHALL BE CONSISTENT WITH THE ROADWAY CONSTRUCTION SEQUENCE TO MINIMIZE TRAFFIC DISRUPTION.

PHASE 1

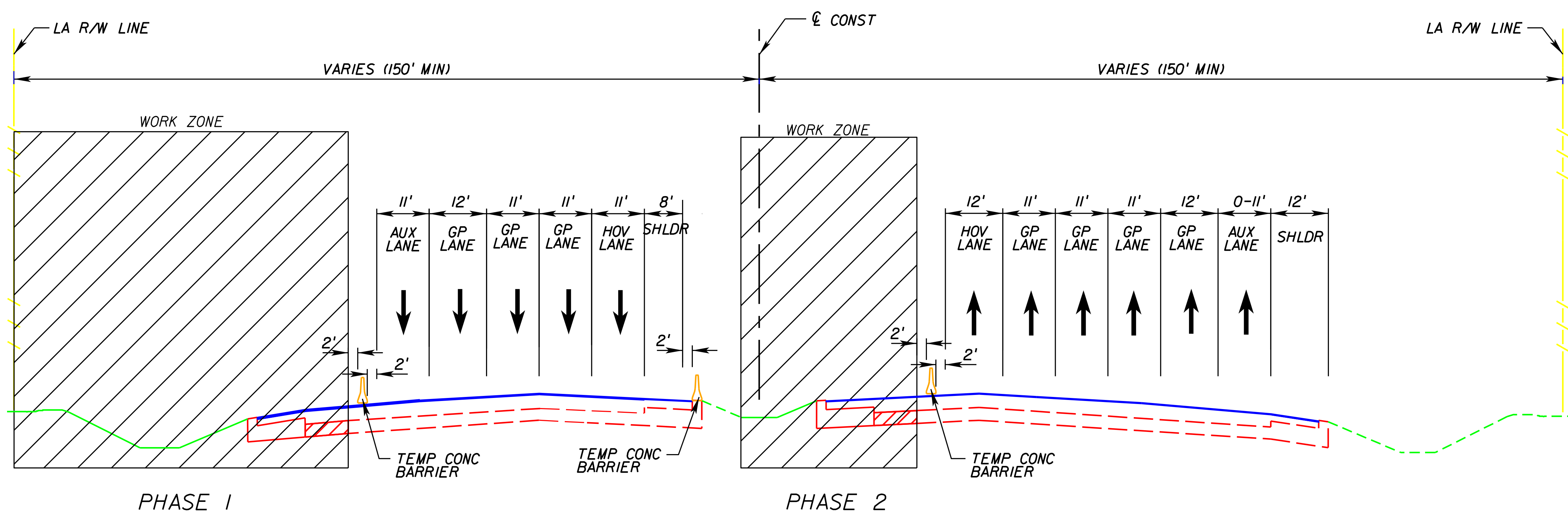
1. SHOWN HERE.
2. PROVIDE TEMPORARY CONCRETE BARRIER WALL.
3. WIDEN TO THE OUTSIDE FOR THE SOUTHBOUND LANES.

PHASE 2

1. SHOWN HERE.
2. PROVIDE TEMPORARY CONCRETE BARRIER WALL.
3. WIDEN TO THE INSIDE FOR THE NORTHBOUND LANES.

PHASE 3

1. NOT SHOWN HERE.
2. MILLING AND RESURFACING AS PER FDOT 600'S SERIES.



TYPICAL SECTION
FROM SOUTH OF PARK & RIDE TO NORTH OF PARK & RIDE

RECOMMENDED ALTERNATIVE
BUILD ALTERNATIVE 1

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

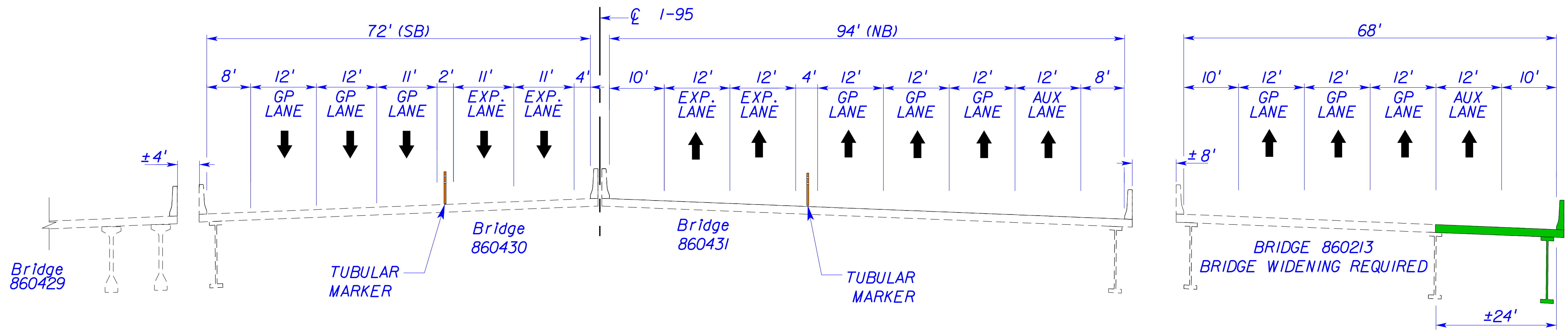
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

TRAFFIC CONTROL PLANS

SHEET NO. 32

BUILD ALTERNATIVE 1A
&
BUILD ALTERNATIVE 1B

NOTE: BUILD ALTERNATIVES 1A & 1B INCLUDE THE SAME TYPICAL SECTION, PLAN AND MOT SHEETS SHOWN IN BUILD ALTERNATIVE 1 PLUS THE FOLLOWING DETAIL SHEETS.



BRIDGE OVER SOUTH FORK NEW RIVER

BUILD ALTERNATIVE 1A TYPICAL SECTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

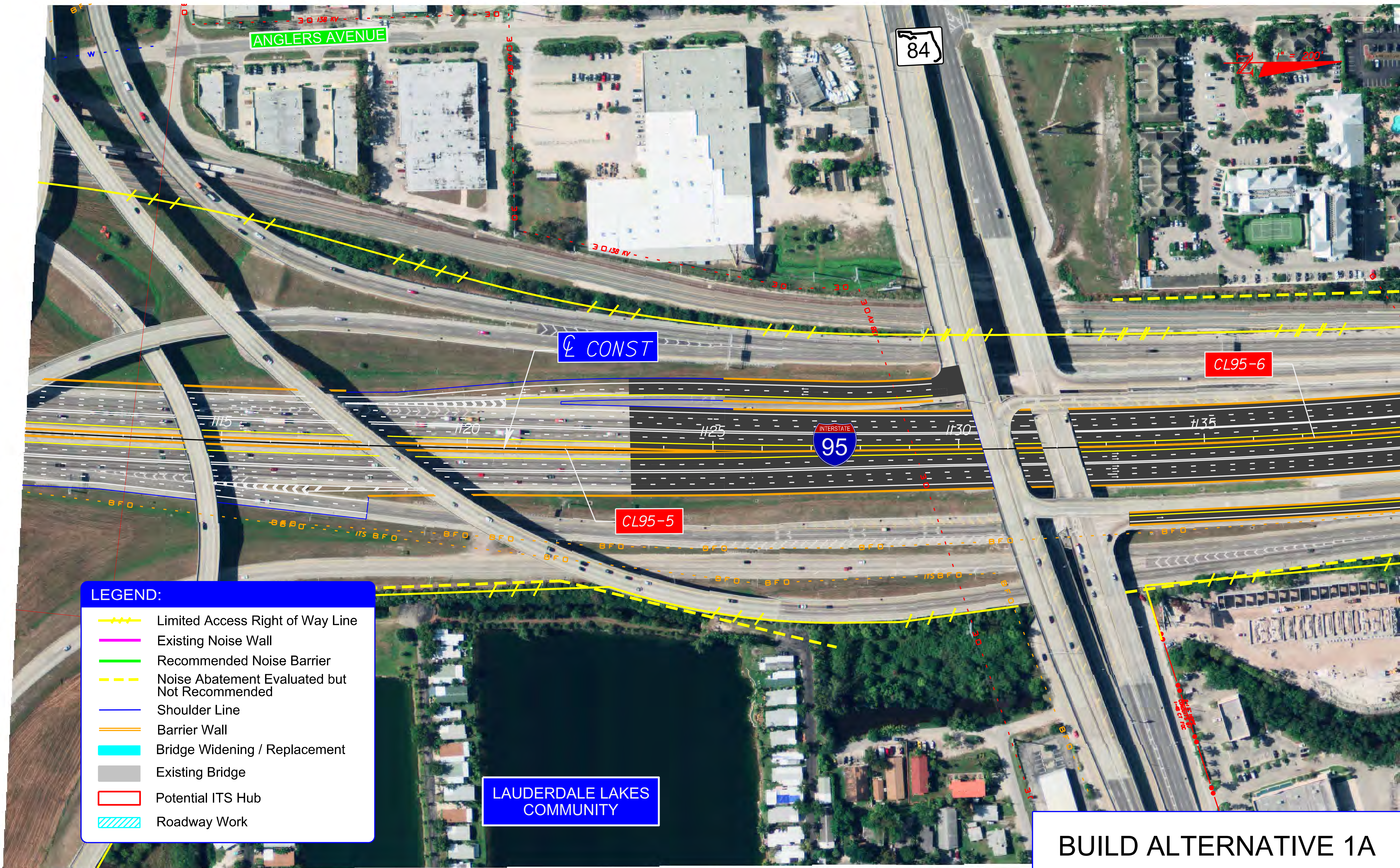
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

SPECIAL DETAILS

SHEET NO. 34

dachang 6/24/2013 5:15:31 PM V:\2167\active\216700070\B-Engineering\2. Alternative Analysis



BUILD ALTERNATIVE 1A

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

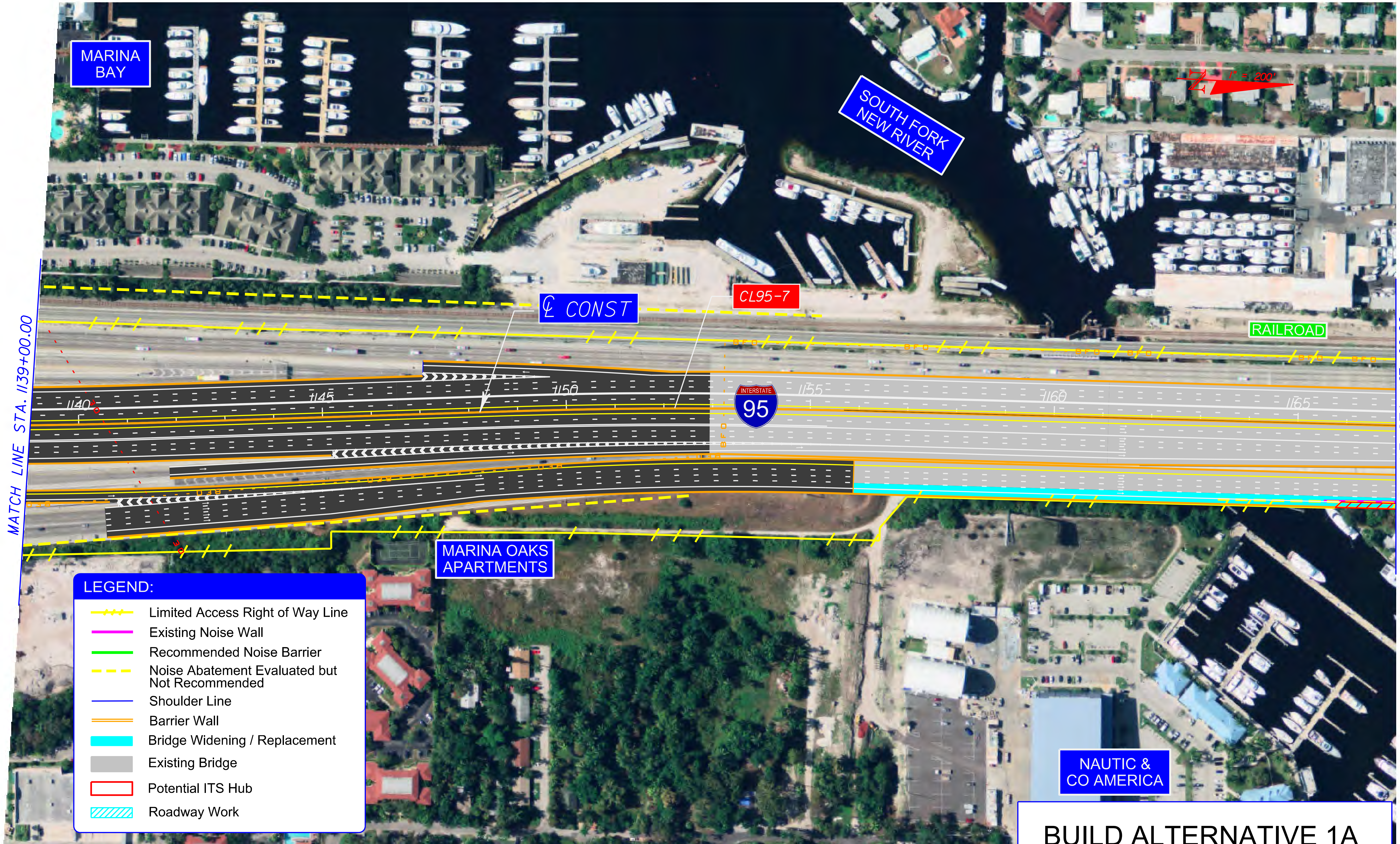
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

SPECIAL DETAILS

SHEET NO.
35

dachang 6/24/2013 5:16:21 PM V:\2167\active\216700070\B-Engineering\2. Alternative Analysis\Concept Plans\Concept 3\Build Alt I



BUILD ALTERNATIVE 1A

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

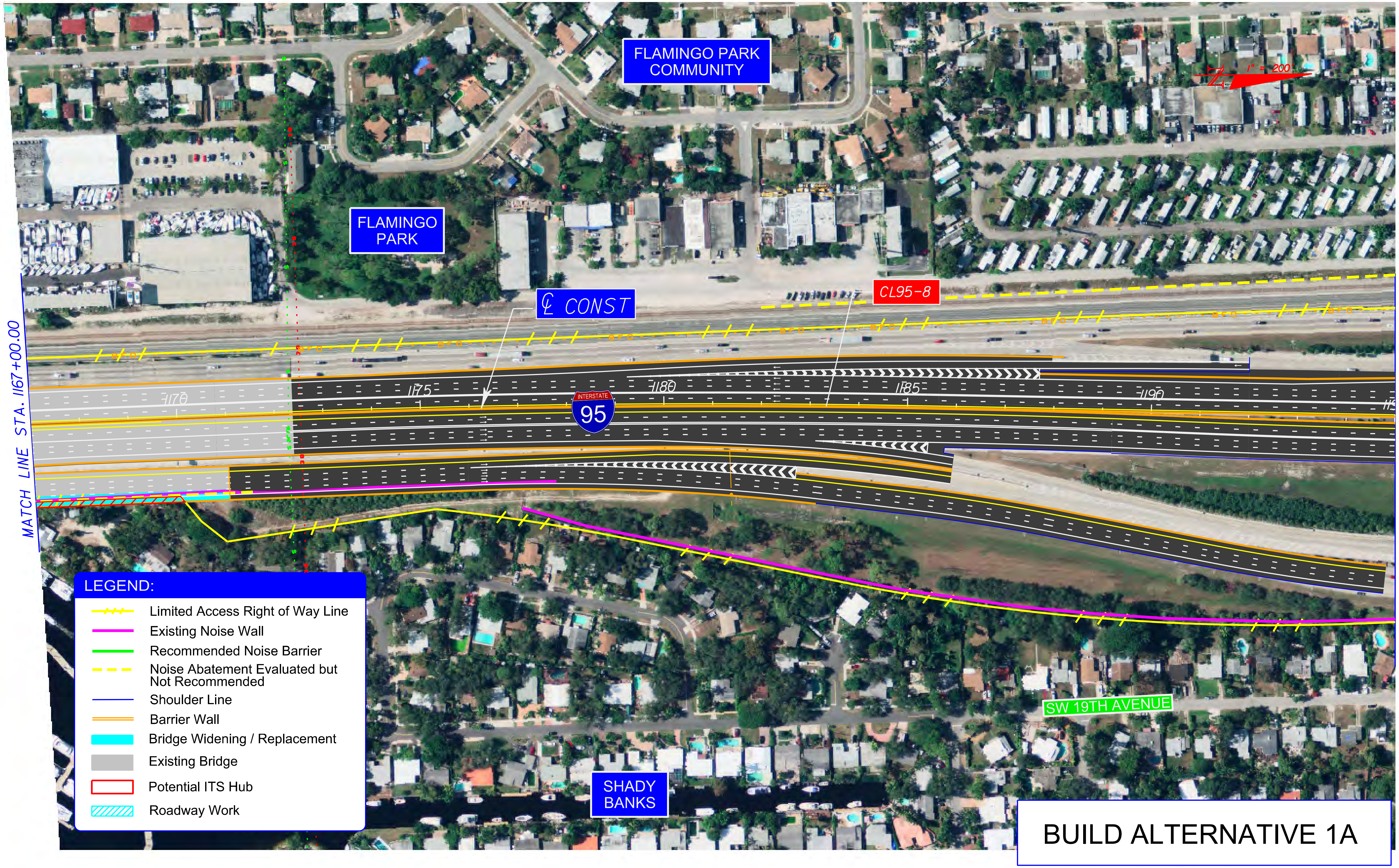
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

SPECIAL DETAILS

SHEET NO. 36

dachang 6/24/2013 5:16:48 PM V:\2167\active\216700070\B-Engineering\2. Alternative Analysis\Concept Plans\Concept 3\Build Alt 1a



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

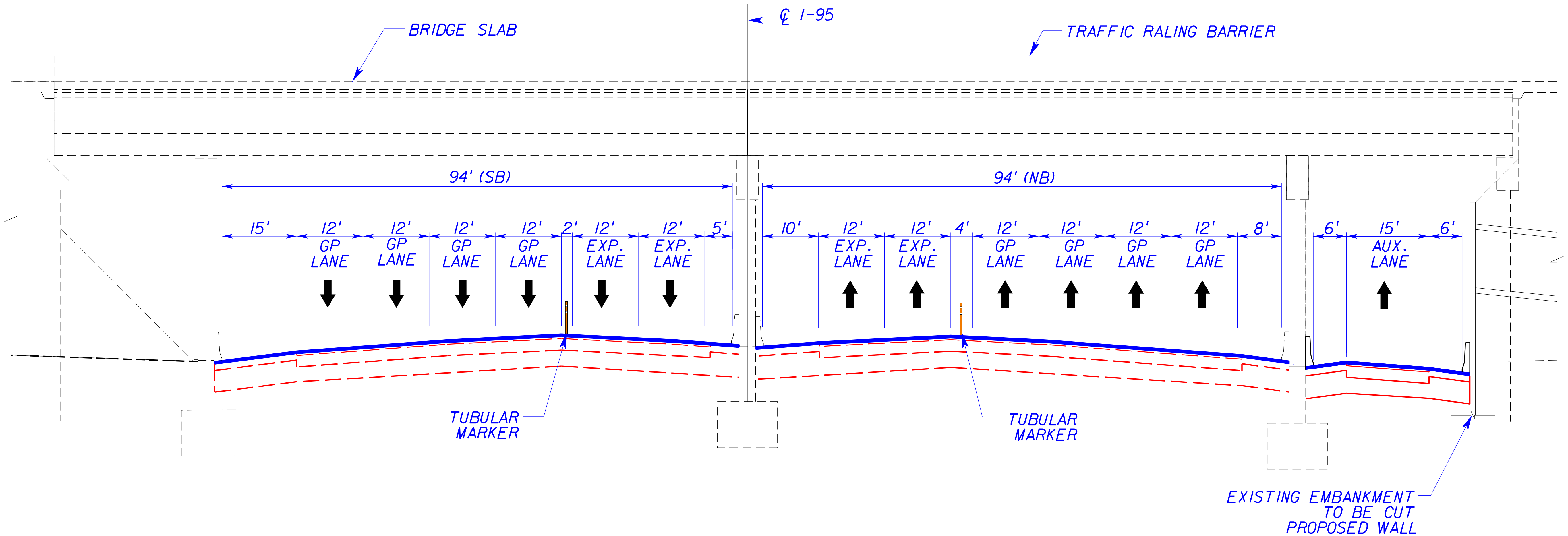
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

SPECIAL DETAILS

SHEET NO.
37

dachang 6/24/2013 5:17:16 PM V:\2167\active\216700070\B-Engineering\2. Alternative Analysis\Concept Plans\Concept 3\Build Alt 1a



TYPICAL SECTION
SUNRISE BOULEVARD

BUILD ALTERNATIVE 1B
TYPICAL SECTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

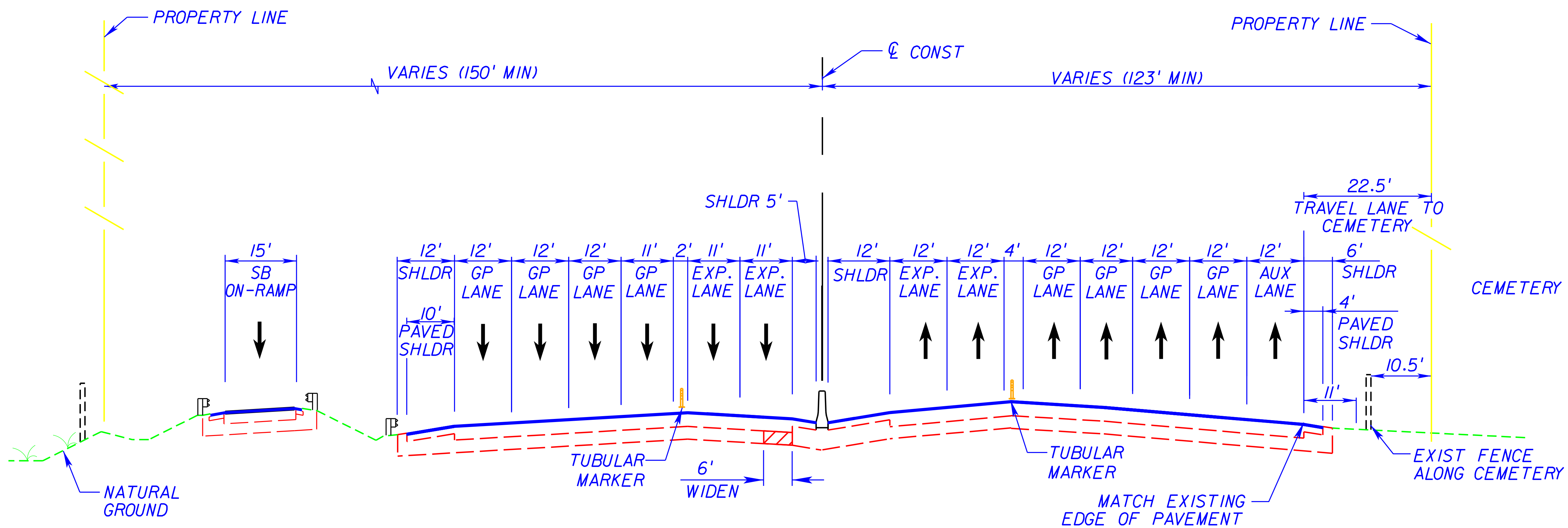
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

SPECIAL DETAILS

SHEET NO. 38



TYPICAL SECTION
NORTH WOODLAWN CEMETERY

BUILD ALTERNATIVE 1B
TYPICAL SECTION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

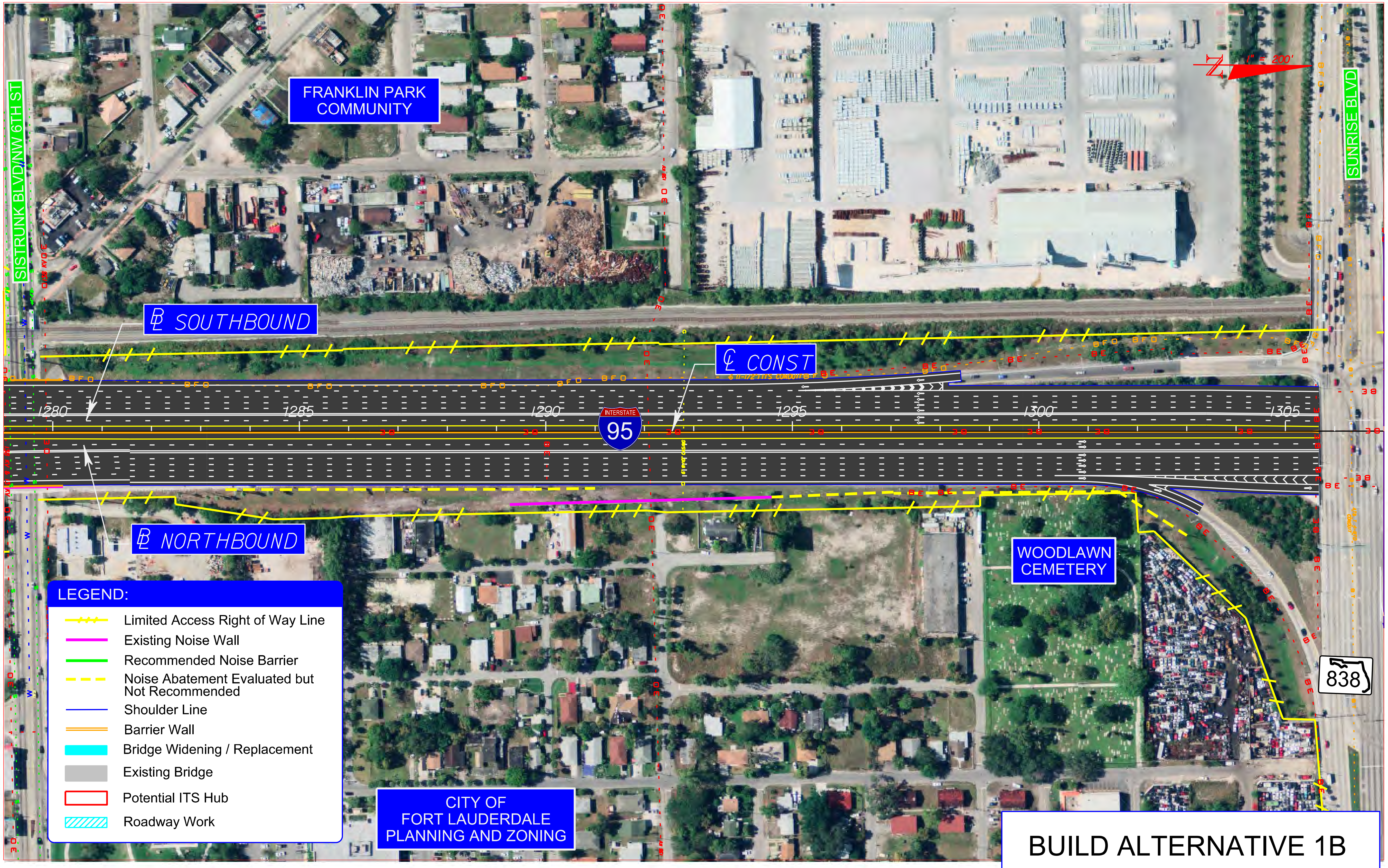
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

SPECIAL DETAILS

SHEET NO. 39



BUILD ALTERNATIVE 1B

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

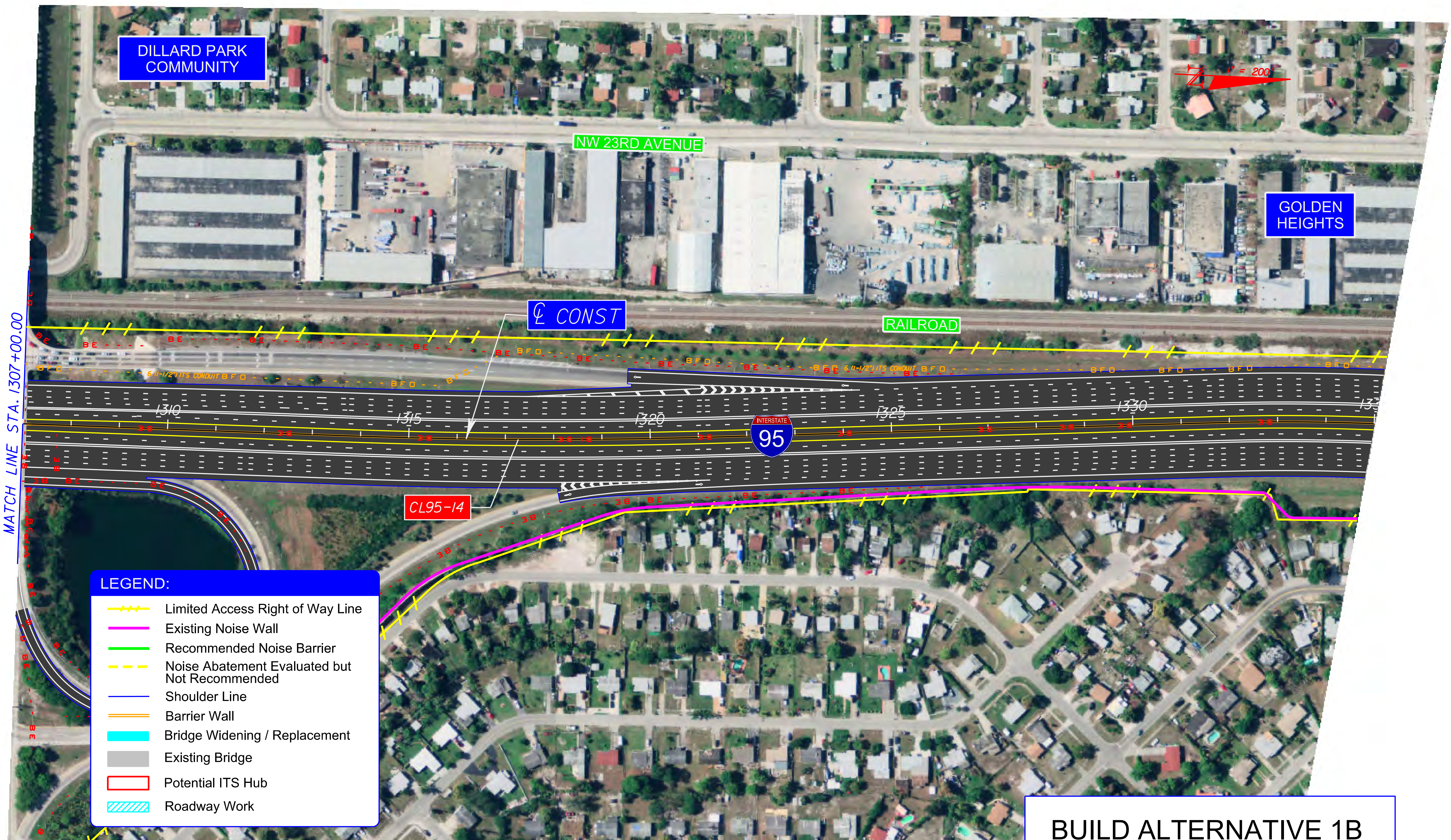
SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

SPECIAL DETAILS

SHEET NO.
40



BUILD ALTERNATIVE 1B

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

SILVIA M. BELTRE, P.E.
P.E. LICENSE NUMBER 51295
STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
CERTIFICATE OF AUTHORIZATION 00027013

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	BROWARD	429804-1-22-01

SPECIAL DETAILS

SHEET NO.
41

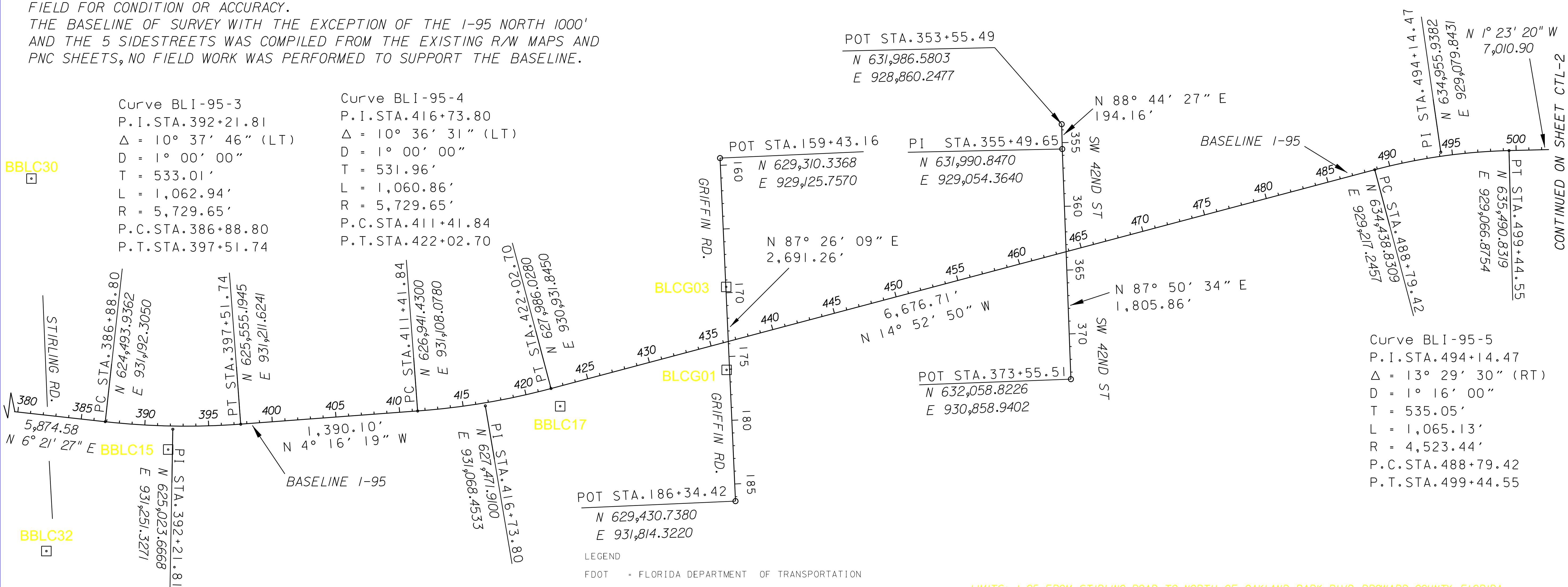
dachang 6/24/2013 5:18:45 PM V:\2167\active\216700070\B-Engineering\2. Alternative Analysis\Concept Plans\Concept 3\Build Alt 1B

SPECIFIC PURPOSE SURVEY

N.A.V.D. 88

SCALE NTS

NOTE: ALL CONTROL MONUMENTS SHOWN WITH THE EXCEPTION OF BLC5, BLC7, C01, AND C02 ARE FROM A COMPILATION OF PNC SHEETS SUPPLIED BY THE FLORIDA DEPARTMENT OF TRANSPORTATION, FM NUMBERS 231731-1-52-01, 231733-1-52-01, 231734-1-32-01, 413795-1-52-01. SAID CONTROL MONUMENTS HAVE NOT BEEN VARIFIED IN THE FIELD FOR CONDITION OR ACCURACY.
THE BASELINE OF SURVEY WITH THE EXCEPTION OF THE I-95 NORTH 1000' AND THE 5 SIDESTREETS WAS COMPILED FROM THE EXISTING R/W MAPS AND PNC SHEETS, NO FIELD WORK WAS PERFORMED TO SUPPORT THE BASELINE.



LEGEND

FDOT	= FLORIDA DEPARTMENT OF TRANSPORTATION
S.R.	= STATE ROAD
⊡	= DENOTES BRASS DISC IN CONCRETE
FM	= FINANCIAL MANAGEMENT.
⊙	= DENOTES 1/2" PIPE W/ CAP.
NAVD	= NORTH AMERICAN VERTICAL DATUM
PC	= POINT OF CURVTURE
PI	= POINT OF INTERSECTION
NTS	= NOT TO SCALE
PT	= POINT OF TANGENCY
POT	= POINT ON TANGENT
STA	= STATION

BASELINE OF SURVEY WAS NOT STAKED IN THE FIELD.
BEARINGS AND COORDINATES ARE RELATIVE TO THE STATE PLANE COORDINATES, FLORIDA EAST ZONE, NORTH AMERICAN DATUM (NAD) OF 1983 ADJUSTMENT OF 1990
A BEARING OF N06°18'13.6"W HAS BEEN ESTABLISHED BETWEEN MONUMENTS
BBLC15 STAMPED 9-86-01 C15 TO
BBLC17 STAMPED 9-86-01 C17
VERTICAL DATUM N.A.V.D. 1988
PROJECT UNITS U.S. SURVEY FEET
FIELD BOOK REFERENCES 4319626
ELECTRONIC DATABASE N/A

LIMITS: I-95 FROM STIRLING ROAD TO NORTH OF OAKLAND PARK BLVD, BROWARD COUNTY, FLORIDA.

SURVEYOR'S CERTIFICATION
I HEREBY CERTIFY THIS SPECIFIC PURPOSE SURVEY WAS MADE FOR THE PURPOSE OF SURVEYING, REFERENCING, DESCRIBING AND MAPPING THE PRIMARY NETWORK CONTROL OR BASELINE FOR THE TRANSPORTATION FACILITY DEPICTED HEREON AND THAT SAID SURVEY WAS DONE UNDER MY RESPONSIBLE CHARGE AND MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 5J-17 FLORIDA ADMINISTRATIVE CODE PURSUANT TO SECTION 472.027 FLORIDA STATUTES. THIS MAP CONSISTING OF SHEETS CTL-1 THROUGH CTL-5 IS A TRUE, ACCURATE AND COMPLETE DEPICTION OF THE RESULTS OF A FIELD SURVEY PERFORMED UNDER MY DIRECTION AND COMPLETED ON APRIL 12th., 2012.

SURVEYOR FRANCISCO L. NUNEZ JR PSM NUMBER 6382

NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF THE FLORIDA LICENSED SURVEYOR AND MAPPER

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 5J-17.062, F.A.C.

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

C H PEREZ & ASSOCIATES CONSULTING ENGINEERS, INC
CERTIFICATE OF AUTHORIZATION NO. EB-25976/LB-7360
9594 NW 41 STREET, SUITE 201
MIAMI, FLORIDA 33178
(305)592-1070 / FAX: (305)592-1078

FRANCISCO L. NUNEZ JR, P.S.M.
P.S.M. LICENSE NO. 6382

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
I-95	BROWARD	429804-1-22-01

PROJECT NETWORK CONTROL

SHEET NO. CTL-1

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SPECIFIC PURPOSE SURVEY

N.A.V.D. 88

NOTE: ALL CONTROL MONUMENTS SHOWN WITH THE EXCEPTION OF BLC5, BLC7, CO1, AND CO2 ARE FROM A COMPILATION OF PNC SHEETS SUPPLIED BY THE FLORIDA DEPARTMENT OF TRANSPORTATION, FM NUMBERS 231731-1-52-01, 231733-1-52-01, 231734-1-32-01, 413795-1-52-01. SAID CONTROL MONUMENTS HAVE NOT BEEN VARIFIED IN THE FIELD FOR CONDITION OR ACCURACY.
THE BASELINE OF SURVEY WITH THE EXCEPTION OF THE I-95 NORTH 1000' AND THE 5 SIDESTREETS WAS COMPILED FROM THE EXISTING R/W MAPS AND PNC SHEETS, NO FIELD WORK WAS PERFORMED TO SUPPORT THE BASELINE.

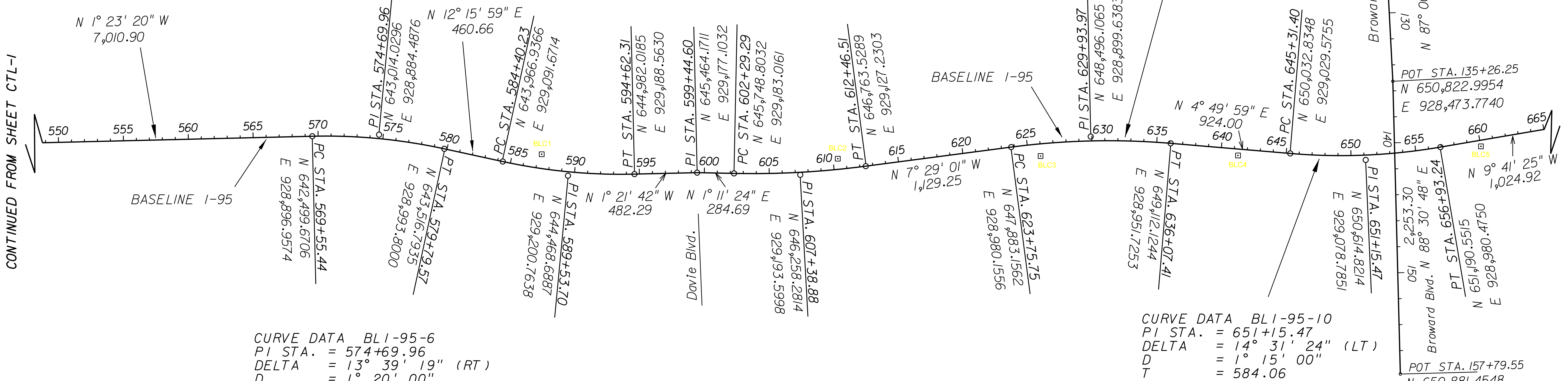
N

SCALE NTS

CURVE DATA BL I-95-7
PI STA. = 589+53.70
DELTA = 13° 37' 41" (LT)
D = 1° 20' 00"
T = 513.47
L = 1,022.08
R = 4,297.18
PC STA. = 584+40.23
PT STA. = 594+62.31

CURVE DATA BL I-95-8
PI STA. = 607+38.88
DELTA = 8° 40' 25" (LT)
D = 0° 51' 10"
T = 509.59
L = 1,017.22
R = 6,719.56
PC STA. = 602+29.29
PT STA. = 612+46.51

CURVE DATA BL I-95-9
PI STA. = 629+93.97
DELTA = 12° 19' 00" (RT)
D = 1° 00' 00"
T = 618.22
L = 1,231.65
R = 5,729.58
PC STA. = 623+75.75
PT STA. = 636+07.41



CURVE DATA BL I-95-6
PI STA. = 574+69.96
DELTA = 13° 39' 19" (RT)
D = 1° 20' 00"
T = 514.51
L = 1,024.12
R = 4,297.18
PC STA. = 569+55.44
PT STA. = 579+79.57

CURVE DATA BL I-95-10
PI STA. = 651+15.47
DELTA = 14° 31' 24" (LT)
D = 1° 15' 00"
T = 584.06
L = 1,161.84
R = 4,583.66
PC STA. = 645+31.40
PT STA. = 656+93.24

LEGEND

FDOT	-	FLORIDA DEPARTMENT OF TRANSPORTATION
S.R.	-	STATE ROAD
⊡	-	DENOTES BRASS DISC IN CONCRETE
FM	-	FINANCIAL MANAGEMENT.
⊙	-	DENOTES 1/2" PIPE W/ CAP.
NAVD	-	NORTH AMERICAN VERTICAL DATUM
PC	-	POINT OF CURVATURE
PI	-	POINT OF INTERSECTION
NTS	-	NOT TO SCALE
PT	-	POINT OF TANGENCY
POT	-	POINT ON TANGENT
STA	-	STATION

BASELINE OF SURVEY WAS NOT STAKED IN THE FIELD.
BEARINGS AND COORDINATES ARE RELATIVE TO THE STATE PLANE COORDINATES, FLORIDA EAST ZONE, NORTH AMERICAN DATUM (NAD) OF 1983 ADJUSTMENT OF 1990
A BEARING OF N06°18'13.6"W HAS BEEN ESTABLISHED BETWEEN MONUMENTS BBLC15 STAMPED 9-86-01 C15 TO BBLC17 STAMPED 9-86-01 C17
VERTICAL DATUM N.A.V.D. 1988
PROJECT UNITS U.S. SURVEY FEET
FIELD BOOK REFERENCES 4319626
ELECTRONIC DATABASE N/A

LIMITS: I-95 FROM STIRLING ROAD TO NORTH OF OAKLAND PARK BLVD, BROWARD COUNTY, FLORIDA.

SURVEYOR'S CERTIFICATION
I HEREBY CERTIFY THIS SPECIFIC PURPOSE SURVEY WAS MADE FOR THE PURPOSE OF SURVEYING, REFERENCING, DESCRIBING AND MAPPING THE PRIMARY NETWORK CONTROL OR BASELINE FOR THE TRANSPORTATION FACILITY DEPICTED HEREON AND THAT SAID SURVEY WAS DONE UNDER MY RESPONSIBLE CHARGE AND MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 5J-17 FLORIDA ADMINISTRATIVE CODE PURSUANT TO SECTION 472.027 FLORIDA STATUTES. THIS MAP CONSISTING OF SHEETS CTL-1 THROUGH CTL-5 IS A TRUE, ACCURATE AND COMPLETE DEPICTION OF THE RESULTS OF A FIELD SURVEY PERFORMED UNDER MY DIRECTION AND COMPLETED ON APRIL 12th., 2012.

SURVEYOR FRANCISCO L. NUNEZ JR PSM NUMBER 6382

NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF THE FLORIDA LICENSED SURVEYOR AND MAPPER

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

C H PEREZ & ASSOCIATES CONSULTING ENGINEERS, INC
CERTIFICATE OF AUTHORIZATION NO. EB-25976/LB-7360
9594 NW 41 STREET, SUITE 201
MIAMI, FLORIDA 33178
(305)592-1070 / FAX: (305)592-1078

FRANCISCO L. NUNEZ JR, P.S.M.
P.S.M. LICENSE NO. 6382

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
I-95	BROWARD	429804-1-22-01

PROJECT NETWORK CONTROL

SHEET NO. CTL-2

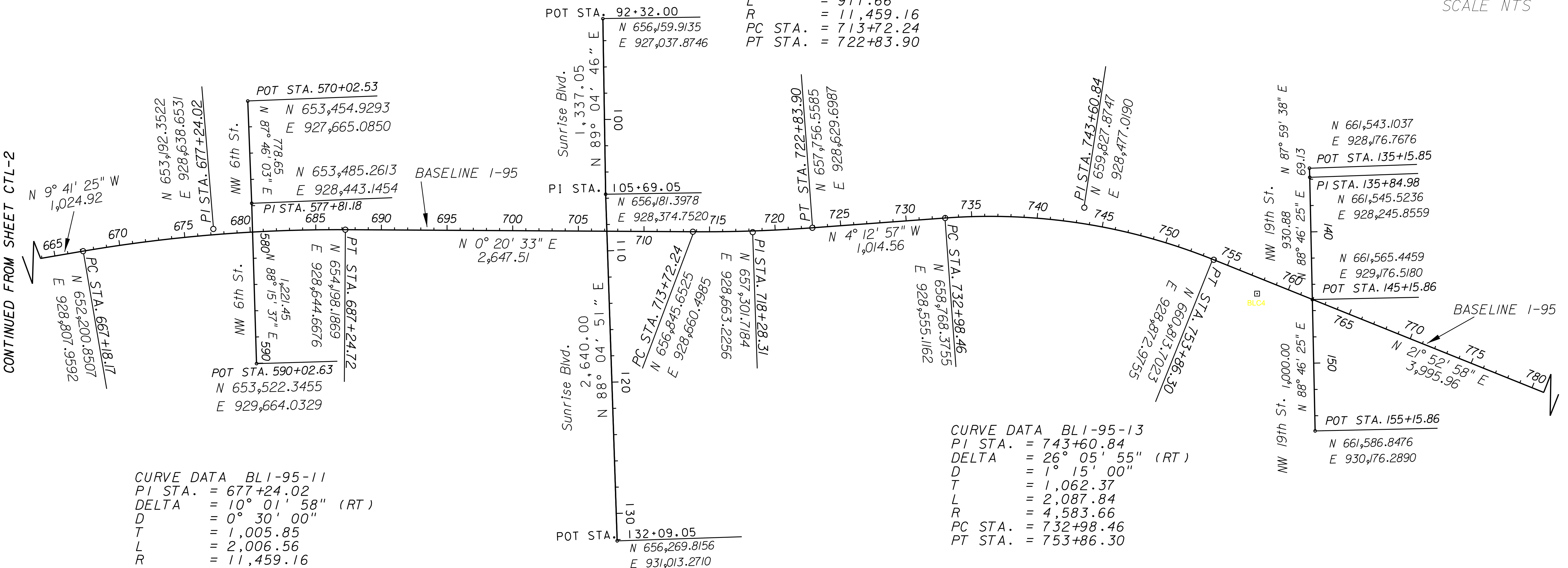
NOTE: ALL CONTROL MONUMENTS SHOWN WITH THE EXCEPTION OF BLC5, BLC7, C01, AND C02 ARE FROM A COMPILATION OF PNC SHEETS SUPPLIED BY THE FLORIDA DEPARTMENT OF TRANSPORTATION, FM NUMBERS 231731-1-52-01, 231733-1-52-01, 231734-1-32-01, 413795-1-52-01. SAID CONTROL MONUMENTS HAVE NOT BEEN VARIFIED IN THE FIELD FOR CONDITION OR ACCURACY.
THE BASELINE OF SURVEY WITH THE EXCEPTION OF THE I-95 NORTH 1000' AND THE 5 SIDESTREETS WAS COMPILED FROM THE EXISTING R/W MAPS AND PNC SHEETS, NO FIELD WORK WAS PERFORMED TO SUPPORT THE BASELINE.

SPECIFIC PURPOSE SURVEY

N.A.V.D. 88

CURVE DATA BL I-95-12
PI STA. = 718+28.31
DELTA = 4° 33' 30" (LT)
D = 0° 30' 00"
T = 456.07
L = 911.66
R = 11,459.16
PC STA. = 713+72.24
PT STA. = 722+83.90

SCALE NTS



CURVE DATA BL I-95-11
PI STA. = 677+24.02
DELTA = 10° 01' 58" (RT)
D = 0° 30' 00"
T = 1,005.85
L = 2,006.56
R = 11,459.16
PC STA. = 667+18.17
PT STA. = 687+24.72

CURVE DATA BL I-95-13
PI STA. = 743+60.84
DELTA = 26° 05' 55" (RT)
D = 1° 15' 00"
T = 1,062.37
L = 2,087.84
R = 4,583.66
PC STA. = 732+98.46
PT STA. = 753+86.30

LEGEND

FDOT	- FLORIDA DEPARTMENT OF TRANSPORTATION
S.R.	- STATE ROAD
⊡	- DENOTES BRASS DISC IN CONCRETE
FM	- FINANCIAL MANAGEMENT.
⊙	- DENOTES 1/2" PIPE W/ CAP.
NAVD	- NORTH AMERICAN VERTICAL DATUM
PC	- POINT OF CURVTURE
PI	- POINT OF INTERSECTION
NTS	- NOT TO SCALE
PT	- POINT OF TANGENCY
POT	- POINT ON TANGENT
STA	- STATION

BASELINE OF SURVEY WAS NOT STAKED IN THE FIELD.
BEARINGS AND COORDINATES ARE RELATIVE TO THE STATE PLANE COORDINATES, FLORIDA EAST ZONE, NORTH AMERICAN DATUM (NAD) OF 1983 ADJUSTMENT OF 1990
A BEARING OF N06°18'13.6"W HAS BEEN ESTABLISHED BETWEEN MONUMENTS
BBLC15 STAMPED 9-86-01 C15 TO
BBLC17 STAMPED 9-86-01 C17
VERTICAL DATUM N.A.V.D. 1988
PROJECT UNITS U.S. SURVEY FEET
FIELD BOOK REFERENCES 4319626
ELECTRONIC DATABASE N/A

LIMITS: I-95 FROM STIRLING ROAD TO NORTH OF OAKLAND PARK BLVD, BROWARD COUNTY, FLORIDA.

SURVEYOR'S CERTIFICATION
I HEREBY CERTIFY THIS SPECIFIC PURPOSE SURVEY WAS MADE FOR THE PURPOSE OF SURVEYING, REFERENCING, DESCRIBING AND MAPPING THE PRIMARY NETWORK CONTROL OR BASELINE FOR THE TRANSPORTATION FACILITY DEPICTED HEREON AND THAT SAID SURVEY WAS DONE UNDER MY RESPONSIBLE CHARGE AND MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 5J-17 FLORIDA ADMINISTRATIVE CODE PURSUANT TO SECTION 472.027 FLORIDA STATUTES. THIS MAP CONSISTING OF SHEETS CTL-1 THROUGH CTL-5 IS A TRUE, ACCURATE AND COMPLETE DEPICTION OF THE RESULTS OF A FIELD SURVEY PERFORMED UNDER MY DIRECTION AND COMPLETED ON APRIL 12th., 2012.

SURVEYOR FRANCISCO L. NUNEZ JR PSM NUMBER 6382

NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF THE FLORIDA LICENSED SURVEYOR AND MAPPER

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 5J-17.062, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

C H PEREZ & ASSOCIATES CONSULTING ENGINEERS, INC
CERTIFICATE OF AUTHORIZATION NO. EB-25976/LB-7360
9594 NW 41 STREET, SUITE 201
MIAMI, FLORIDA 33178
(305)592-1070 / FAX: (305)592-1078

FRANCISCO L. NUNEZ JR, P.S.M.
P.S.M. LICENSE NO. 6382

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
I-95	BROWARD	429804-1-22-01

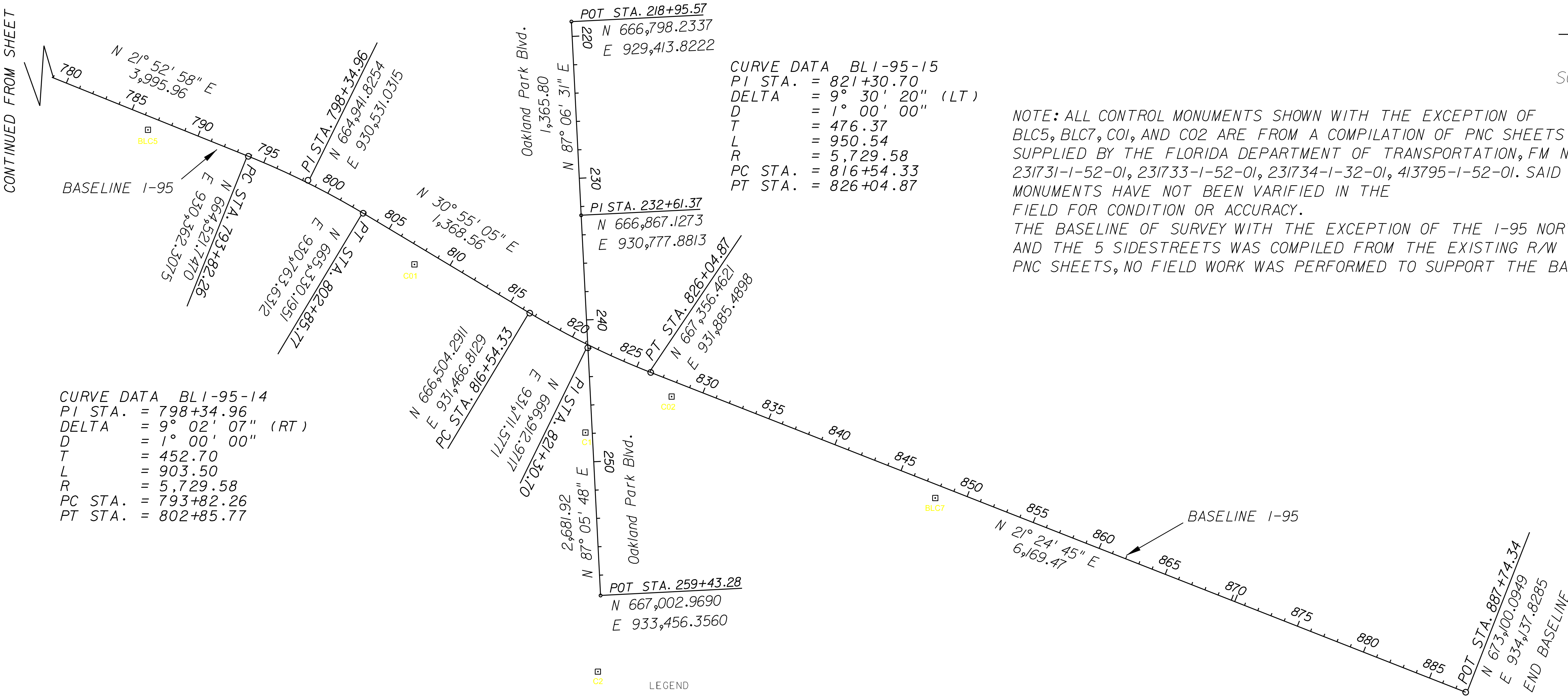
PROJECT NETWORK CONTROL

SHEET NO. CTL-3

SPECIFIC PURPOSE SURVEY

N.A.V.D. 88

CONTINUED FROM SHEET CTL-3



CURVE DATA BL I-95-15
PI STA. = 821+30.70
DELTA = 9° 30' 20" (LT)
D = 1° 00' 00"
T = 476.37
L = 950.54
R = 5,729.58
PC STA. = 816+54.33
PT STA. = 826+04.87

CURVE DATA BL I-95-14
PI STA. = 798+34.96
DELTA = 9° 02' 07" (RT)
D = 1° 00' 00"
T = 452.70
L = 903.50
R = 5,729.58
PC STA. = 793+82.26
PT STA. = 802+85.77

NOTE: ALL CONTROL MONUMENTS SHOWN WITH THE EXCEPTION OF BLC5, BLC7, C01, AND C02 ARE FROM A COMPILATION OF PNC SHEETS SUPPLIED BY THE FLORIDA DEPARTMENT OF TRANSPORTATION, FM NUMBERS 231731-1-52-01, 231733-1-52-01, 231734-1-32-01, 413795-1-52-01. SAID CONTROL MONUMENTS HAVE NOT BEEN VARIFIED IN THE FIELD FOR CONDITION OR ACCURACY.
THE BASELINE OF SURVEY WITH THE EXCEPTION OF THE I-95 NORTH 1000' AND THE 5 SIDESTREETS WAS COMPILED FROM THE EXISTING R/W MAPS AND PNC SHEETS, NO FIELD WORK WAS PERFORMED TO SUPPORT THE BASELINE.

LEGEND

- FDOT - FLORIDA DEPARTMENT OF TRANSPORTATION
- S.R. - STATE ROAD
- ⊡ - DENOTES BRASS DISC IN CONCRETE
- FM - FINANCIAL MANAGEMENT.
- ⊙ - DENOTES 1/2" PIPE W/ CAP.
- NAVD - NORTH AMERICAN VERTICAL DATUM
- PC - POINT OF CURVTURE
- PI - POINT OF INTERSECTION
- NTS - NOT TO SCALE
- PT - POINT OF TANGENCY
- POT - POINT ON TANGENT
- STA - STATION

BASELINE OF SURVEY WAS NOT STAKED IN THE FIELD.
BEARINGS AND COORDINATES ARE RELATIVE TO THE STATE PLANE COORDINATES, FLORIDA EAST ZONE, NORTH AMERICAN DATUM (NAD) OF 1983 ADJUSTMENT OF 1990
A BEARING OF N06°18'13.6"W HAS BEEN ESTABLISHED BETWEEN MONUMENTS BBLC15 STAMPED 9-86-01 C15 TO BBLC17 STAMPED 9-86-01 C17
VERTICAL DATUM N.A.V.D. 1988
PROJECT UNITS U.S. SURVEY FEET
FIELD BOOK REFERENCES 4319626
ELECTRONIC DATABASE N/A

LIMITS: I-95 FROM STIRLING ROAD TO NORTH OF OAKLAND PARK BLVD, BROWARD COUNTY, FLORIDA.

SURVEYOR'S CERTIFICATION
I HEREBY CERTIFY THIS SPECIFIC PURPOSE SURVEY WAS MADE FOR THE PURPOSE OF SURVEYING, REFERENCING, DESCRIBING AND MAPPING THE PRIMARY NETWORK CONTROL OR BASELINE FOR THE TRANSPORTATION FACILITY DEPICTED HEREON AND THAT SAID SURVEY WAS DONE UNDER MY RESPONSIBLE CHARGE AND MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 5J-17 FLORIDA ADMINISTRATIVE CODE PURSUANT TO SECTION 472.027 FLORIDA STATUTES. THIS MAP CONSISTING OF SHEETS CTL-1 THROUGH CTL-5 IS A TRUE, ACCURATE AND COMPLETE DEPICTION OF THE RESULTS OF A FIELD SURVEY PERFORMED UNDER MY DIRECTION AND COMPLETED ON APRIL 12th., 2012.

SURVEYOR FRANCISCO L. NUNEZ JR PSM NUMBER 6382

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NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 5J-17.062, F.A.C.

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

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FRANCISCO L. NUNEZ JR, P.S.M.
P.S.M. LICENSE NO. 6382

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
I-95	BROWARD	429804-1-22-01

PROJECT NETWORK CONTROL

SHEET NO. CTL-4

SPECIFIC PURPOSE SURVEY

N.G.V.D. 88

POINT NAME	(X) EASTING	(Y) NORTHING	SCALE FACTOR	LATITUDE	LONGITUDE	BASELINE STATION	OFFSET	(Z) ELEVATION	DESCRIPTION
STATION AND OFFSETS FROM THE I-95 BASELINE, MONUMENTS AND DATA TAKEN FROM PNC SHEET 231731-1-52-01									
BBLC 15	931410.131	624986.758	1.00002805	26°03'02.36723"	80°09'41.94706"	391+87.32	184.29' RT	14.23'	POURED CONCRETE MONUMENT WITH BRASS DISC "9-86-01 C15"
BBLC 17	931070.883	628057.799	1.00002783	26°03'32.80374"	80°09'45.45044"	422+36.36	152.81' RT	10.01'	FDOT DISC IN ASPHALT, STAMPED "9-86-01 C17"
STATION AND OFFSETS FROM THE I-95 BASELINE, MONUMENTS AND DATA TAKEN FROM PNC SHEET 231733-1-52-01									
BLC 1	929035.452	644266.871	1.00002655	26°06'13.46355"	80°10'06.63467"	587+28.91	109.21' LT	17.46'	F.D.O.T B.D.I.C STAMPED "9-06-86-C01"
BLC 2	929070.500	646547.959	1.00002658	26°06'36.05262"	80°10'06.09040"	610+37.61	81.12' LT	13.62'	F.D.O.T B.D.I.C STAMPED "9-06-86-C02"
BLC 3	929050.393	648110.144	1.00002656	26°06'51.52534"	80°10'06.20148"	625+95.36	95.06' RT	9.97'	F.D.O.T B.D.I.C STAMPED "9-06-86-C03"
BLC 4	929045.098	649630.391	1.00002656	26°07'06.58177"	80°10'06.15301"	641+31.70	49.37' RT	8.61'	F.D.O.T B.D.I.C STAMPED "9-06-86-C04"
BLC 5	928974.698	651501.926	1.00002652	26°07'25.12136"	80°10'06.79414"	660+01.15	46.72' RT	8.26'	F.D.O.T B.D.I.C STAMPED "9-06-86-C05"
STATION AND OFFSETS FROM THE I-95 BASELINE, MONUMENT AND DATA TAKEN FROM PNC SHEET 231734-1-32-01									
BLC 4	929131.481	661144.507	1.00002661	26°09'00.60856"	80°10'04.39725"	757+89.62	116.59' RT	26.19'	F.D.O.T B.D.I.C
STATION AND OFFSETS FROM THE I-95 BASELINE, MONUMENTS ESTABLISHED BY CHP.									
BLC 5	930176.132	663814.225	1.00002726	26°09'26.98217"	80°09'52.74561"	786+56.33	90.94' RT	8.57'	F.D.O.T B.D.I.C STAMPED BLC 5
BLC 7	932769.841	669361.737	1.00002890	26°10'21.75674"	80°09'23.88693"	847+94.60	91.23' RT	22.71'	F.D.O.T B.D.I.C STAMPED BLC 7
C01	931124.151	665692.068	1.00002786	26°09'45.51920"	80°09'42.20905"	807+81.46	123.36' RT	4.46'	SET FDOT B.D.I.C. STAMPED 9 86 11 C01
C02	932055.505	667504.079	1.00002845	26°10'03.40507"	80°09'31.85912"	828+04.37	104.39' RT	14.16'	SET FDOT B.D.I.C. STAMPED 9 86 11 C02
STATION AND OFFSETS ARE FROM THE STIRLING ROAD BASELINE, MONUMENTS AND DATA TAKEN FROM PNC SHEET 231731-1-52-01									
BBLC 30	929286.859	623915.776	1.00002671	26°02'51.89504"	80°10'05.30171"	OUT OF	RANGE	11.33'	FDOT DISC "848 86 01 C30"
BBLC 32	932205.951	624034.090	1.00002855	26°02'52.88148"	80°09'33.28893"	OUT OF	RANGE	7.30'	FDOT DISC "848 86 01 C32"
STATION AND OFFSETS ARE FROM THE GRIFFIN ROAD BASELINE, MONUMENTS AND DATA TAKEN FROM PNC SHEET 231731-1-52-01									
BLC G01	930785.930	629361.581	1.00002765	26°03'45.73422"	80°09'48.48321"	176+03.96	23.08' RT	8.41'	FDOT BRASS DISC IN CONCRETE, STAMPED "9 86 01 G01"
BLC G03	930135.555	629358.068	1.00002724	26°03'45.74070"	80°09'55.61497"	169+54.08	2.51' LT	15.39'	FDOT BRASS DISC IN CONCRETE, STAMPED "9 86 01 G03"
STATION AND OFFSETS ARE FROM THE OAKLAND PARK BLVD. BASELINE, MONUMENTS AND DATA TAKEN FROM PNC SHEET 413795-1-52-01									
C1	932308.935	666897.097	1.00002861	26°09'57.37750"	80°09'29.12090"	247+91.97	47.62' RT	5.20'	C1-BHA AL, DISK IN CONC. SWK. STAMPED 816-86-04-C1
C2	933992.971	666984.855	1.00002968	26°09'58.13821"	80°09'10.63260"	OUT OF	RANGE	4.46'	C2-BHA AL, DISK IN CONC. SWK. STAMPED 816-86-04-C2

NOTE: RT = RIGHT
LT = LEFT

NOTE: ALL CONTROL MONUMENTS SHOWN WITH THE EXCEPTION OF BLC5, BLC7, C01, AND C02 ARE FROM A COMPILATION OF PNC SHEETS SUPPLIED BY THE FLORIDA DEPARTMENT OF TRANSPORTATION, FM NUMBERS 231731-1-52-01, 231733-1-52-01, 231734-1-32-01, 413795-1-52-01. SAID CONTROL MONUMENTS HAVE NOT BEEN VARIFIED IN THE FIELD FOR CONDITION OR ACCURACY.
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