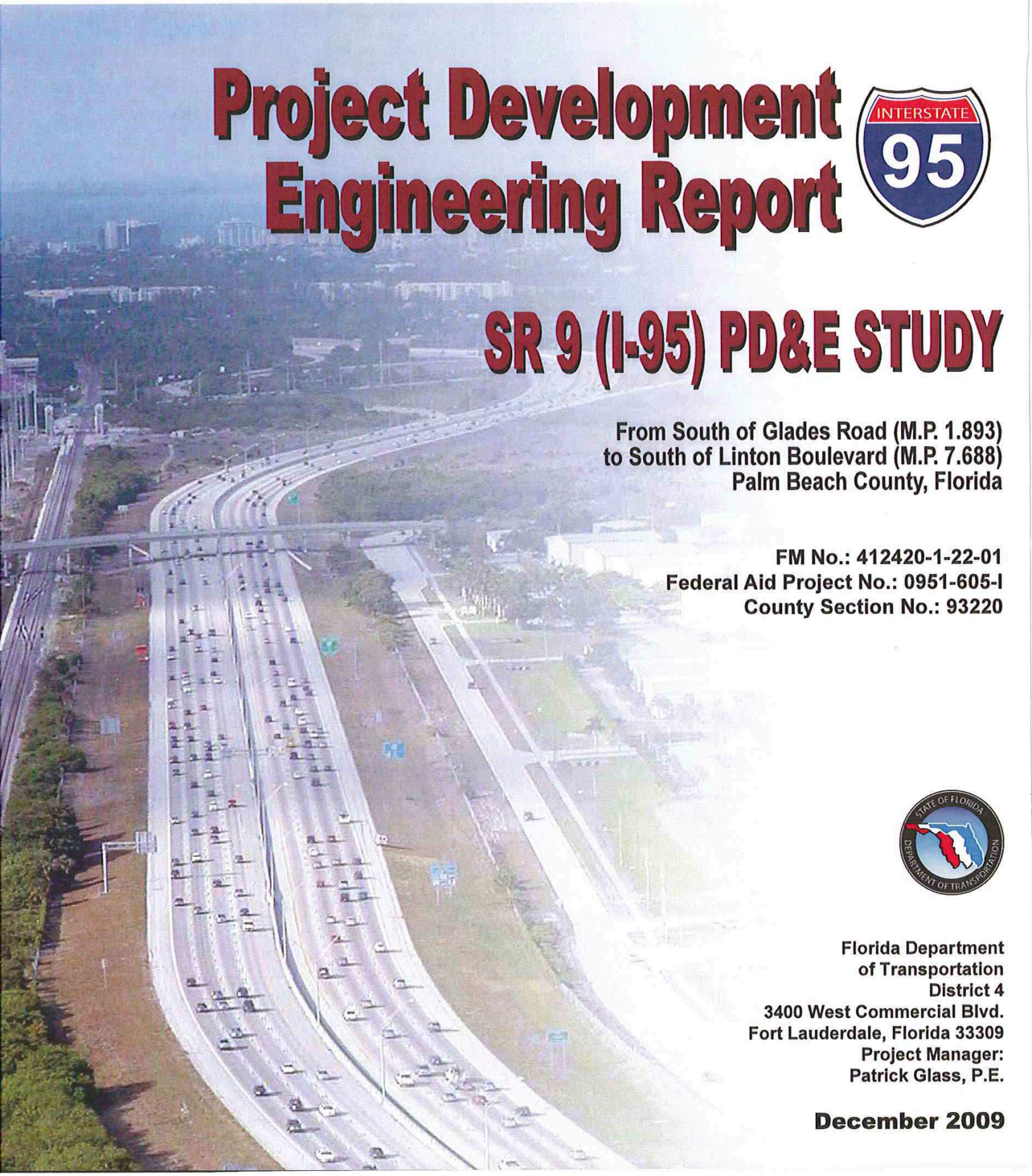

Project Development Engineering Report

SR 9 (I-95) PD&E STUDY

From South of Glades Road (M.P. 1.893)
to South of Linton Boulevard (M.P. 7.688)
Palm Beach County, Florida

FM No.: 412420-1-22-01
Federal Aid Project No.: 0951-605-I
County Section No.: 93220

Florida Department
of Transportation
District 4
3400 West Commercial Blvd.
Fort Lauderdale, Florida 33309
Project Manager:
Patrick Glass, P.E.

December 2009

PROJECT DEVELOPMENT ENGINEERING REPORT

From South of Glades Road
to South of Linton Boulevard
Palm Beach County, Florida

FM No: 412420-1-22-01
Federal Aid Project No: 0951-605-I
County Section No: 93220

Prepared by

TranSystems

2400 East Commercial Blvd
Ste 1000
Fort Lauderdale, FL 33308

Prepared for

Florida Department of Transportation
District Four
3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

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CHAPTER 1
Summary of Project

1.1 Recommendations

This I-95 Project Development Engineering Report (PDER) serves as a companion document to the I-95 Project Development Summary Report (PDSR) for the PD&E Study with limits from south of Glades Road (MP 1.893) to south of Linton Boulevard (MP 7.688). The study also includes the preparation of System Interchange Justification Report (SIJR) for a proposed new interchange between Spanish River Boulevard (NW 40th Street) and Yamato Road (SR 794) and is referred to as the "Airport Road/FAU" interchange for the PD&E Study. In addition to the new interchange and evaluating improvements for I-95, the project also includes improvements for Glades Road from Butts Road (MP 4.625) to just east of Florida Atlantic Boulevard (MP 6.680). A project location map for the study is provided in Figure 1-1.

The "Build" alternative is recommended as the proposed alternative for I-95. This report recommends the addition of two general use lanes from south of Glades Road to south of Linton Boulevard and two auxiliary lanes from Glades Road to the Congress Avenue Connector. A new interchange ("Airport Road/FAU" interchange) near Spanish River Boulevard is also recommended along with the eight-laning of Glades Road from Butts Road to east of Florida Atlantic Boulevard. The existing HOV lanes are to be maintained and incorporated into the "Build" alternative. Below is a list of these proposed improvements.

- **I-95 Mainline** – Add two general use lanes from south of Glades Road to south of Linton Boulevard, and add two auxiliary lanes from Glades Road to the Congress Avenue Connector.

- **Glades Road** – Glades Road is proposed to be widened from six lanes to eight lanes from Butts Road to just east of Florida Atlantic Boulevard. Intersection improvements along Glades Road are proposed to be implemented as needed based on forecast traffic.

- **Glades Road Bridges and Interchange** – The westbound Glades Road Bridge over Military Trail needs to be widened to accommodate the new eight-lane section. Separate bridges are provided for the two loop ramp extensions, to avoid widening the existing Glades Road bridges over I-95. This also avoids widening the eastbound Glades Road Bridge over Military Trail since the existing off-ramp lane will be converted to the fourth through-lane. The on-ramps from the two loops are to be accommodated by removing the slope pavement under the end spans of the Glades Road bridges over I-95.

- **New "Airport/FAU" Interchange** – A new three-level "Directional-T" interchange ("Airport/FAU" interchange) is proposed south of Yamato Road, connecting to the Florida Atlantic Boulevard/Spanish River Boulevard intersection leading into the Florida Atlantic University campus.

- **Yamato Road Interchange** – Two-lane on/off ramps for all Yamato Road connections to I-95 to/from the south are proposed. It is also proposed that the interchange geometry will be improved and both loop ramps will be modified. Braided ramps are to be provided, as needed, to avoid weaving conflicts with the new "Airport/FAU" interchange, located immediately south of Yamato Road. An eight-lane section is recommended on Yamato Road under I-95 to connect to the eight-lane section of Yamato Road to the west.

I-95 PD&E Study

Project Location Map **Figure 1-1**

- **Tri-Rail/El Rio Trail Pedestrian Overpass at Yamato Road –** A pedestrian overpass at Yamato Road is recommended on the alignment of the El Rio Trail, and providing for access to the Tri-Rail station, and to the El Rio Trail, as shown in Figure 1-2. If funding is not available for the pedestrian overpass over Tri-Rail then a diversion route, represented by the dotted lines in Figure 1-2 (1-2-3 & 4-5-6), could be implemented.

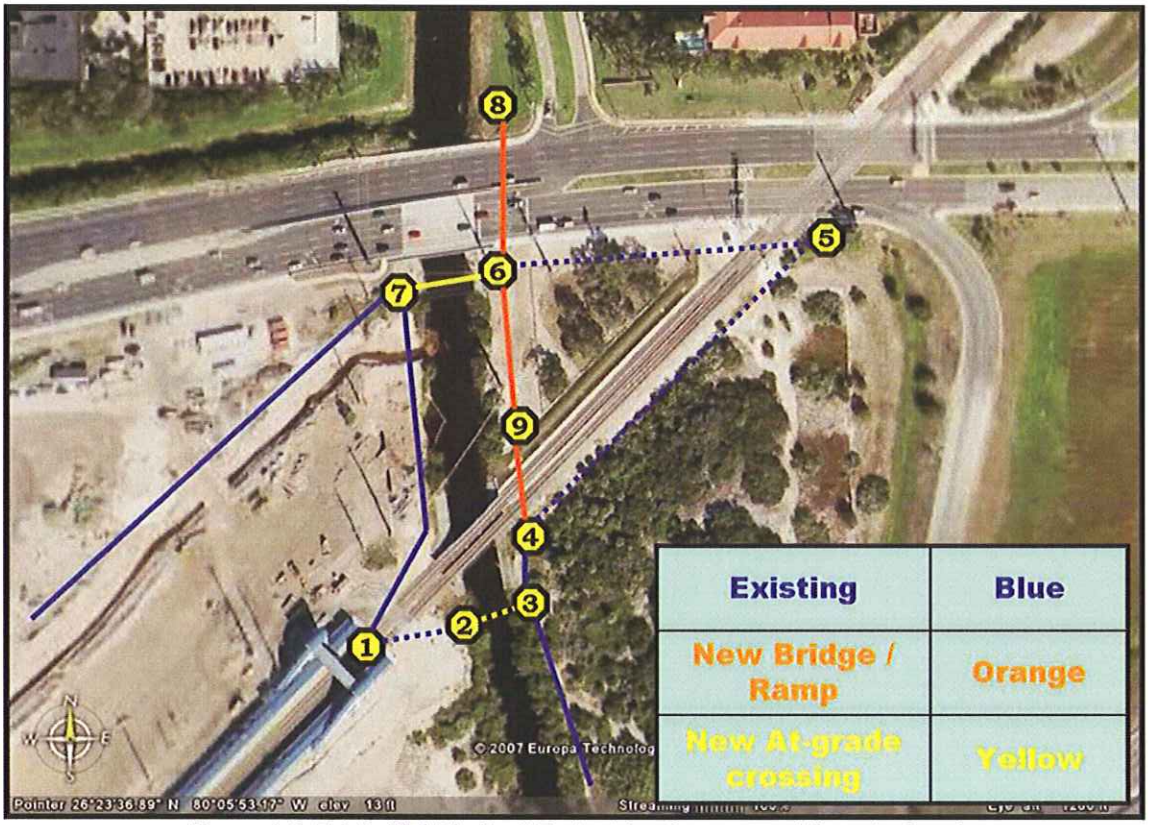


Figure 1-2: Tri-Rail/El Rio Trail Pedestrian Overpass at Yamato Road

- **Tri-Rail/FAU Connector Ramps** - Roadway ramps that provide for a direct connection between the Tri-Rail station, Yamato Road, and the "Airport/FAU" interchange connection to Florida Atlantic Boulevard are recommended to be integrated into the Yamato Road/FAU interchange subsystem. This will allow for direct shuttle bus service to/from FAU and the Tri-Rail station but will also be open for public use.

- **Variable Message Signing (VMS) Subsystem** – A ground-mounted variable message electronic signing system is suggested for further study for the subject section of I-95. This subsystem should be considered as part of an overall Intelligent Transportation Systems (ITS) for I-95 and Tri-Rail. Specific features of the VMS system should include: FAU stadium event traffic management, Tri-Rail departure data, alternative route information, and highway condition (congestion) data. Currently, an ITS project is under construction for I-95 throughout all of Palm Beach County. The estimated completion date is April 2011.

- **Congestion Management Study** – A congestion management study is recommended for the entire I-95 system, including this project. Horizon year forecast traffic has surpassed the projections in the "I-95 Master Plan", and LOS "F" conditions are predicted on the I-95 mainline from Oakland Park Boulevard in Broward County to Linton Boulevard in Palm

Beach County, even if I-95 is widened to 12-lanes. Congestion management, Intelligent Transportation Systems (ITS), and managed lane studies are needed to develop a system-wide strategy to cope with future congestion in this corridor.

The recommended improvements to I-95 are proposed in order to provide needed capacity and, thereby, improve the quality of life of local residents by improving public safety and by providing a positive economic and community development framework for the surrounding area. The proposed improvements will reduce travel-time, resulting in savings for the residents of Palm Beach County and cross county commuters.

The proposed improvements are anticipated to have minimal environmental impacts as a result of utilizing the existing corridor and by mitigating potential environmental impacts. The project does not negatively or seriously impact any known land use patterns, archeological or historical resources, recreational areas, wetlands, wild and scenic rivers, coastal zones, or floodplains. No negative impacts on air or water quality are anticipated. Potential noise impacts will be mitigated, if necessary, through the use of noise walls as part of the project. Thirty-four (34) sites within the project study area were determined to be handlers or potential handlers of hazardous material. Of those 34, 12 were given a contamination rating of "medium" and three of "high". The rest were rated "no" or "low" risk.

The acquisition of additional right-of-way for mainline improvements is not necessary, as the proposed mainline roadway typical section and all associated drainage needs can be accommodated within the existing right-of-way. Detention ponds are proposed within the footprints of the existing and proposed interchange areas. Acquisition of state-owned land for the proposed "Airport/FAU" interchange will be required. The majority of this property is owned by Florida Atlantic University. Therefore, it is anticipated that this land acquisition will not require eminent domain for the state-owned parcel. In addition, a narrow sliver of right-of-way will also be required from two parcels (one owner) in the southeast quadrant of the I-95/Yamato Road interchange. These parcels are east of the El Rio Canal and south of Yamato Road, adjacent to the existing northbound off-ramp at Yamato Road. This property will be needed to accommodate the proposed "braided" ramps and the northbound-to-westbound loop ramp extension at the Yamato Road interchange. Additional right-of-way is also needed between Butts Road and Renaissance Way along both sides of Glades Road. Right-of-way will also be required near the Airport Road/Glades Road intersection on the north side of Glades Road to accommodate the Glades Road widening and an expanded intersection at this location. This property is publicly-owned by the City of Boca Raton. On the south side of Glades Road at this intersection (NW 15th Avenue), a narrow sliver of right-of-way will be required on the west side from the Boca Raton High School. Finally, additional right-of-way will be needed along Spanish River Boulevard on both sides in order to accommodate widening to six lanes from Florida Atlantic Boulevard to NW 6th Terrace, a distance of approximately 900'. This right-of-way includes narrow slivers from state-owned (FAU) land, one vacant private parcel, and from the Vistazo at Boca Raton Community.

By creating the new "Airport/FAU" interchange, the traffic volumes on Spanish River Boulevard will increase. This is a concern, because the land uses to the east are residential. A public workshop (Nob Hill meeting) was conducted for residences in the area, and the vast majority of those attending were in favor of the new interchange, with very little opposition. Florida Atlantic University (FAU) and the Boca Raton Airport support the new interchange along with the FAU Research Park.

Energy consumption will be reduced through the reduction in travel-time and congestion.

It is recommended that no additional drainage be allowed to flow into existing wetlands due to implementation of the proposed improvements. Direct coordination with the South Florida Water Management District (SFWMD) as well as other local drainage districts is recommended to prevent any possible flooding due to the project.

Final recommendations include design and implementation of strategically-placed barrier wall-protected enforcement areas located in the median of the I-95 corridor. These barrier-protected areas will provide median-area protection for Florida Highway Patrol (FHP) vehicles and apprehended violators of the HOV lane system regulations. This recommendation should be considered in final design and based on a system-wide plan for selective enforcement developed in cooperation with the Florida Highway Patrol.

1.2 Commitments

This PD&E Study addresses the proposed roadway improvements that are required to provide I-95 with two additional general use lanes (one in each direction) from south of Glades Road to south of Linton Boulevard and two additional auxiliary lanes (one in each direction) from Glades Road to the Congress Avenue Connector.

An examination of the existing and future traffic data, within the limits of the project, reveals the need to expand the capacity of this segment of roadway from the existing eight lanes to ten and 12 lanes. The traffic volumes show the existing level-of-service along the mainline of I-95 to be "F" from Palmetto Park Road to Yamato Road, and from the Congress Avenue Connector to Linton Boulevard, and " E" from Yamato Road to the Congress Avenue Connector. The proposed widening will help relieve future congestion, enhance safety, and should reduce the number of accidents that would otherwise occur within the corridor.

The proposed roadway improvements are generally consistent with the *I-95/I-595 Master Plan Study* which calls for the addition of two general use lanes from Glades Road to south of Linton Boulevard.

In order to minimize the impacts of this project on the environment, the Florida Department of Transportation (FDOT) is committed to the following measures:

- The FDOT is committed to continuing coordination with the MPO, local communities, and appropriate regulatory agencies as required throughout the final design and permitting phases of the project, as well as prior to and during construction.

- The proposed storm-water facility design will include, at a minimum, the water quantity and water quality treatments as required by the South Florida Water Management District (SFWMD) in Rules FAC 40E-40 and minimum requirements of local water control districts. Rules FAC 40E-40 are the minimum standard rules needed for the project and no special rules apply to this project.

- Disturbed soil surfaces will be re-vegetated and stabilized when practical to minimize temporary construction impacts and prevent erosion.

- Floodplain encroachment will be minimized to the extent practicable and mitigation measures will be developed to compensate for the anticipated encroachment.

- Seventeen (17) potential contamination sites posing a "medium" or "high" risk have been identified. Level II testing will be performed for these sites as determined by the Department. A soil and groundwater survey and plan are recommended to address these areas of concern.

- In the event contamination is detected during construction, the FDOT will notify the Department of Environmental Protection (DEP) and Palm Beach County and the FDOT may address the problem through additional assessment and/or remediation activities.

- The FDOT will make arrangements to properly abandon (in accordance with Chapter 62-532, F.A.C.) and/or replace any groundwater monitoring wells or water production wells that may be destroyed or damaged during construction.

- The FDOT will ensure that any land clearing or construction debris is characterized for disposal. The FDOT will ensure that potentially hazardous materials are managed in accordance with Chapter 62-730, F.A.C. In addition, the FDOT will ensure that any solid wastes or other non-hazardous debris is managed in accordance with Chapter 62-701, F.A.C.

- The FDOT will ensure that staging areas are planned, with controlled access, in order to safely store raw material paints, adhesives, fuels, solvents, lubricating oils, etc. that will be used during construction. The FDOT will ensure that all containers are properly labeled. The FDOT will ensure that written construction Contingency Plans will be developed in the event of a natural disaster, spill, fire or environmental release of hazardous materials.

- The existing sidewalk on the north side of the Spanish River Boulevard Bridge over I-95 will be maintained during construction and temporary short-term detour routes for all required temporary closures will be provided.

- To protect the West Indian Manatee, the FDOT will adhere to the *Standard Manatee Conditions for In-Water Work*. The Conditions will be incorporated into the construction documents and FDOT will require that the construction contractor abide strictly to the guidelines during construction. In addition, grates will be placed over all culverts greater than eight inches to protect manatees.

- FDOT will continue to seek avoidance and minimization measures for wetland impacts through final design and permitting.

- FDOT will provide appropriate wetland mitigation for any loss of suitable wood stork foraging habitat in coordination with the United States Fish and Wildlife Service (USFWS).

- FDOT will coordinate with Palm Beach County Environmental Resource Management (ERM) to determine if scrub jays are present in the Yamato Scrub Natural Area. If scrub jays are present, FDOT will coordinate with USFWS to minimize impacts to the scrub jay.

- To minimize negative project effects to the burrowing owl, FDOT commits to: 1) Conduct a burrowing owl survey prior to construction; 2) Coordinate with the appropriate regulatory agency depending on nesting status. If adult owls are present between February 15 and July 10, or if eggs, hatchlings or fledglings are present, then USFWS Migratory Bird Coordination must occur. If it is non-nesting season, only coordination with FFWCC is required; 3) Obtain appropriate permits to destroy/relocate burrowing owl burrows depending on activity; and 4) Coordinate with the appropriate agency on suitable mitigation and ensure mitigation is implemented, such as, construction of starter burrows with an accompanying T-perch in an area outside of future disturbances.

- FDOT will conduct a preconstruction survey of Wetland W-3a at the FAU Fish Research Center for nesting activity by wading birds. If nesting is observed, then FDOT will

coordinate with Florida Fish and Wildlife Conservation Commission (FFWCC) to avoid adversely affecting State-listed wading birds. The Department will work with FAU and the FFWCC to preserve as much of the Fish Research Center as possible.

- To minimize adverse affects to the Eastern indigo snake, during construction, the FDOT will adhere to the *Standard Protection Measures for the Eastern Indigo Snake*. The measures will be incorporated into the final project construction documents and FDOT will require that the construction contractor abide strictly to the guidelines during construction.

- To minimize direct impacts to the gopher tortoise, FDOT commits to: 1) Avoid and minimize negative project effects to the maximum extent practicable to the gopher tortoise; 2) Conduct a gopher tortoise survey prior to construction; 3) Coordinate with the appropriate regulatory agency; 4) Obtain appropriate permits to relocate gopher tortoises; and 5) Utilize qualified personnel to relocate gopher tortoises to a mutually agreed upon/permitted location.

- The FDOT will scope gopher tortoise burrows located during the survey to determine the presence of any commensals, such as Florida mouse and gopher frog. If listed commensals are sighted, FDOT will coordinate with the appropriate agency.

- State and federally listed plants potentially present in the project area include those endemic to scrub habitats. Scrub areas proposed to be directly impacted by the new interchange, including Uplands U-1, U-2, U-4, U-5 and U-6, will be surveyed for listed plants prior to construction. If listed plants are present, FDOT will coordinate with the appropriate agency.

- The FDOT will continue to coordinate with the appropriate regulatory agencies as required throughout the design and permitting phases of the project, as well as during and after construction.

- The Endangered Species Biological Assessment (ESBA) prepared for this project will be distributed to the appropriate regulatory agencies for review and comment.

- Best Management Practices will be implemented during construction following FDOT's *Standard Specifications for Road and Bridge Construction*.

- The FDOT is committed to the construction of feasible noise abatement measures at noise impacted locations within the project corridor contingent upon the following conditions: 1) performance of a detailed noise analysis during the final design process supports the need for noise abatement, 2) reasonable cost analysis indicates that the economic cost of the barriers will not exceed the cost-reasonable criterion, 3) community input regarding desires, types, heights, and locations (if applicable), 4) consideration of preferences regarding compatibility with adjacent land uses, particularly as addressed by officials having jurisdiction over such land uses; and 5) consideration of safety and engineering aspects as related to the roadway user and the adjacent property owner.

- A PD&E Study for the possible six-laning of Spanish River Boulevard from Military Trail to US 1 is proposed. This study will be coordinated with the Palm Beach County MPO and the City of Boca Raton.

- Maintenance of traffic activities will be coordinated with the City of Boca Raton and Florida Atlantic University during construction.

- The Florida Department of Transportation will coordinate with the Federal Aviation Administration (FAA) during design and construction regarding the Boca Raton Airport runway approaches.

1.3 Description of Proposed Action

The FDOT has initiated a PD&E Study for I-95 in Southern Palm Beach County which involves widening I-95 as well as Glades Road and also includes the preparation of a SIJR for a proposed new interchange with I-95. The location of the new proposed I-95 interchange is between Spanish River Boulevard and Yamato Road and is referred to as the "Airport Road/FAU" interchange for this PD&E Study. The limits for this I-95 PD&E Study are from south of Glades Road (MP 1.893) to south of Linton Boulevard (MP 7.688) and Glades Road from Butts Road (MP 4.625) to just east of Florida Atlantic Boulevard (MP 6.680).

This project includes three existing interchanges. These three interchanges at I-95 are Glades Road, Yamato Road, and the Congress Avenue Connector. Modifications to the Glades Road and Yamato Road interchanges are proposed. Along Glades Road between Butts Road and Florida Atlantic Boulevard, there are seven signalized intersections. These intersections are Butts Road, Renaissance Way, I-95 southbound exit, I-95 northbound exit, Airport Road/NW 15th Avenue, NW 10th Avenue (FAU main entrance), and Florida Atlantic Boulevard. The Glades Road/Airport Road intersection is proposed to be significantly expanded to provide much needed additional capacity due to its close proximity with I-95. Within the Glades Road segment of the project, no access management modifications are proposed with the exception of a full median closure just east of the NW 10th Avenue (FAU main entrance intersection) which provides access to a Florida Power and Light (FP&L) facility.

Laneage

The "Build" alternative includes added lanes for different sections and links in the study area. All of these proposed improvements are illustrated in the Conceptual Plans provided under a separate cover for this project:

- Addition of Two General Use Lanes – This is recommended throughout the I-95 corridor from south of Glades Road to south of Linton Boulevard. This involves adding lanes nine and ten to the existing eight-lane cross-section of I-95 throughout the project limits.

- Addition of Two Auxiliary Lanes – This is recommended from Glades Road to the Congress Avenue Connector: adding lanes 11 and 12 to the I-95 ten-lane section, described above, for 12 lanes total.

- Glades Road – It is recommended that eight lanes be provided on Glades Road from Butts Road to just east of Florida Atlantic Boulevard including bicycle lanes and sidewalks. Glades Road is six lanes at present. A major expanded intersection is also recommended at the Glades Road/Airport Road intersection.

- Yamato Road – Yamato Road has been eight-laned west of the Tri-Rail. The proposed I-95 improvements at Yamato Road are recommended to "match" the eight-laning sectioned through the interchange area.

- Interchange Ramps – Selected ramps in the Glades Road and Yamato Road interchanges are proposed to be widened as required to meet forecast traffic volumes.

- Intersection Laneage – Intersections within the Glades Road and Yamato Road interchanges are recommended for expansion to provide added capacity.

Typical Sections

The recommended I-95 mainline and Glades Road typical sections are illustrated in Figures 1-3 through Figures 1-4. These typical sections reflect the recommended total lanes required for each corridor. A ten-lane section, plus two auxiliary lanes is proposed for I-95. This section is comprised of eight general use lanes, two auxiliary lanes, and two High Occupancy Vehicle (HOV) lanes, from south of Glades Road to Clint Moore Road. The auxiliary lanes taper off at Clint Moore Road and the section then becomes ten lanes up to the northern terminus of the project, south of Linton Boulevard.

The "Build" alternative's mainline typical section involves widening to the outside between south of Glades Road and north of Clint Moore Road. The existing two-foot Jersey barrier will remain in the median. Where the Jersey barrier is used, the two existing 15' shoulders will separate the barrier from the HOV lane. The 15' shoulders provide an extra margin of safety for HOV enforcement. A four-foot buffer (double broken white pavement markings) separates the HOV lane from the general use lanes. All lanes are 12' wide. Throughout the corridor, outside shoulders will be constructed to 12' (ten-feet of paved shoulder with a two-foot stabilized sod shoulder to the outside.)

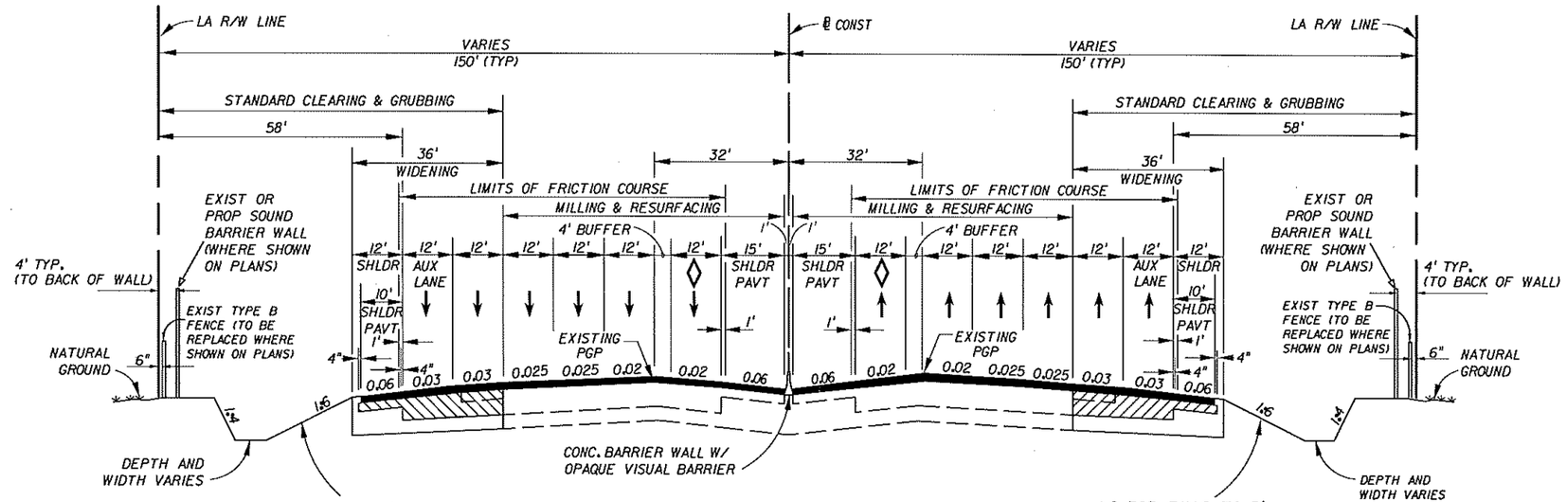
From north of Clint Moore Road to south of Linton Boulevard, widening will transition to the inside as shown in Figure 1-3 (b). Two general use lanes will be added in this section, to provide for ten lanes total, inclusive of two HOV lanes.

An eight-lane typical section is proposed for Glades Road from Butts Road to east of Florida Atlantic Boulevard. Three typical sections are displayed in Figures 1-4 (a,b,c). These sections provide for eight, 12' general use lanes, four-foot bicycle lanes, and curb and gutters plus five-foot, or six-foot sidewalks on both sides. In the "tight" section where the available right-of-way is minimal (between Butts Road and Renaissance Way), the proposed median is 15.5'. East of this location the median expands to 40' then narrows back to 20.5' on the east side of I-95.

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID	412420-1-22-01	FEDERAL AID PROJECT NO.	N/A	COUNTY NAME	PALM BEACH
SECTION NUMBER	93220	ROAD DESIGNATION	SR 9 (I-95)	LIMITS/MILEPOST	MP 1.893 TO MP 6.219
PROJECT DESCRIPTION	Widening and Resurfacing of SR 9 (I-95) from north of Palmetto Park Road to north of Clint Moore Road.				

PROPOSED ROADWAY TYPICAL SECTION
TEN LANE SECTION WITH TWO AUXILIARY LANES



1:6 FOR FILLS TO 5'
1:6 TO EDGE OF CLEAR ZONE &
1:4 FOR FILLS 5' TO 10'
1:6 TO EDGE OF CLEAR ZONE &
1:3 FOR FILLS 10' TO 20'
1:2 (WITH GUARDRAIL) FOR FILLS OVER 20'.

SR 9 (I-95)

STA. 116+33.35 TO STA. 343+42.15

1:6 FOR FILLS TO 5'
1:6 TO EDGE OF CLEAR ZONE &
1:4 FOR FILLS 5' TO 10'
1:6 TO EDGE OF CLEAR ZONE &
1:3 FOR FILLS 10' TO 20'
1:2 (WITH GUARDRAIL) FOR FILLS OVER 20'.

DESIGN SPEED = 70 mph

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2400 E. Commercial Boulevard
Suite1000
Fort Lauderdale, Florida 33308
(954) 653-4700

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

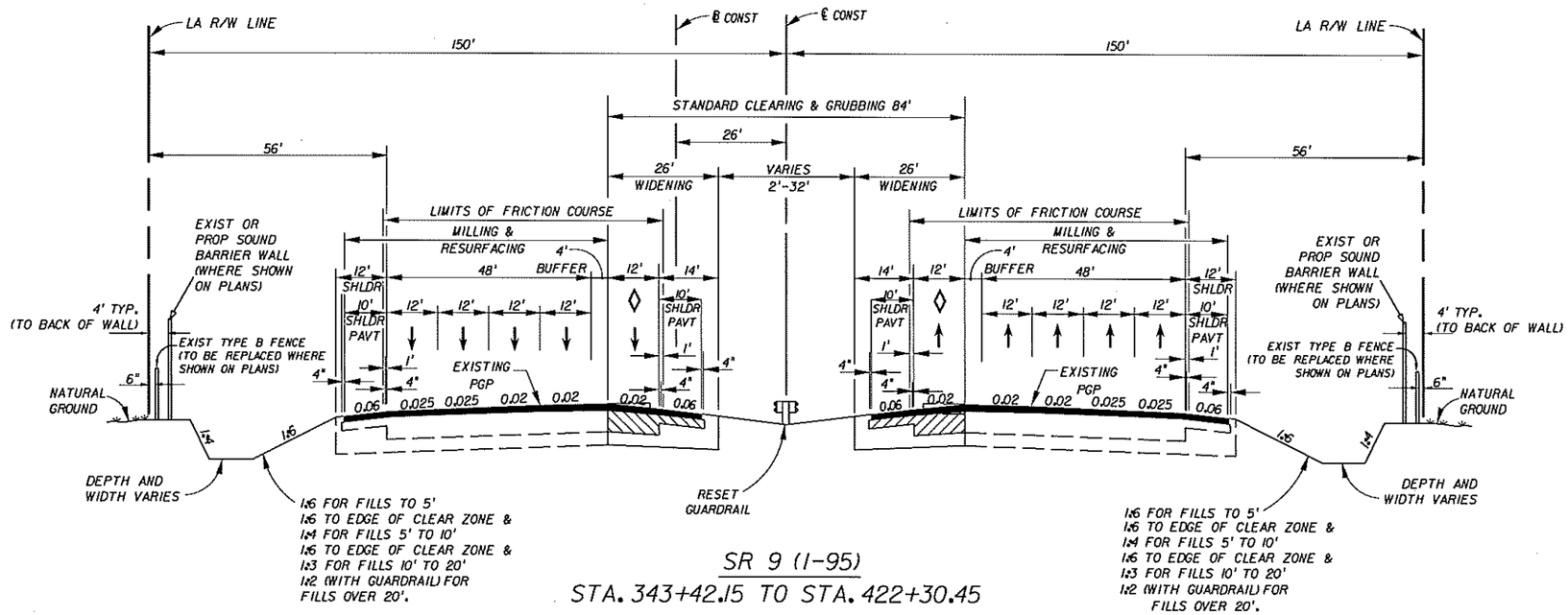
I-95 MAINLINE TYPICAL SECTION

FIGURE NO. 1-3 (a)

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID	412420-1-22-01	FEDERAL AID PROJECT NO.	N/A	COUNTY NAME	PALM BEACH
SECTION NUMBER	93220	ROAD DESIGNATION	SR 9 (I-95)	LIMITS/MILEPOST	MP 6.219 TO MP 7.688
PROJECT DESCRIPTION	Widening and Resurfacing of SR 9 (I-95) from north of Clint Moore Road to south of Linton Boulevard.				

PROPOSED ROADWAY TYPICAL SECTION
TEN LANE SECTION



SR 9 (I-95)

STA. 343+42.15 TO STA. 422+30.45

DESIGN SPEED = 70 mph

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Suite1000
Fort Lauderdale, Florida 33308
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

I-95 MAINLINE TYPICAL SECTION

FIGURE NO. I-3 (b)

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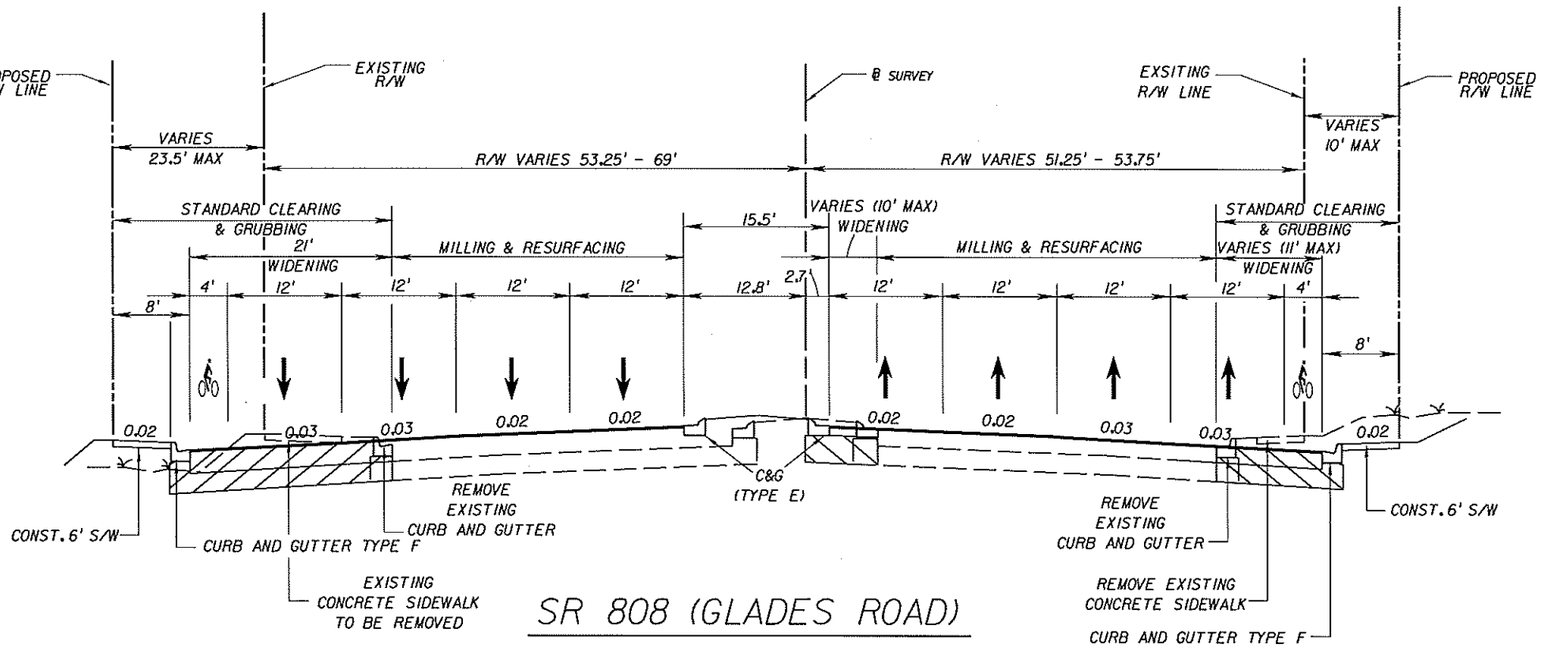
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID	412420-1-22-01	FEDERAL AID PROJECT NO.	N/A	COUNTY NAME	PALM BEACH
SECTION NUMBER	93220	ROAD DESIGNATION	SR 808	LIMITS/MILEPOST	MP 4.625 TO MP 4.879
PROJECT DESCRIPTION	Widening of SR 808 (Glades Road) from Butts Road to east of Renaissance Way.				

PROPOSED ROADWAY TYPICAL SECTION



SR 808 (GLADES ROAD)

STA. 244+00.00 TO STA. 257+32.64

DESIGN SPEED = 45 MPH

TranSystems
2400 E. Commercial Boulevard
Suite1000
Fort Lauderdale, Florida 33308
(954) 653-4700

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
808	PALM BEACH	412420-1-22-01

GLADES ROAD TYPICAL SECTION

FIGURE NO. 1-4 (a)

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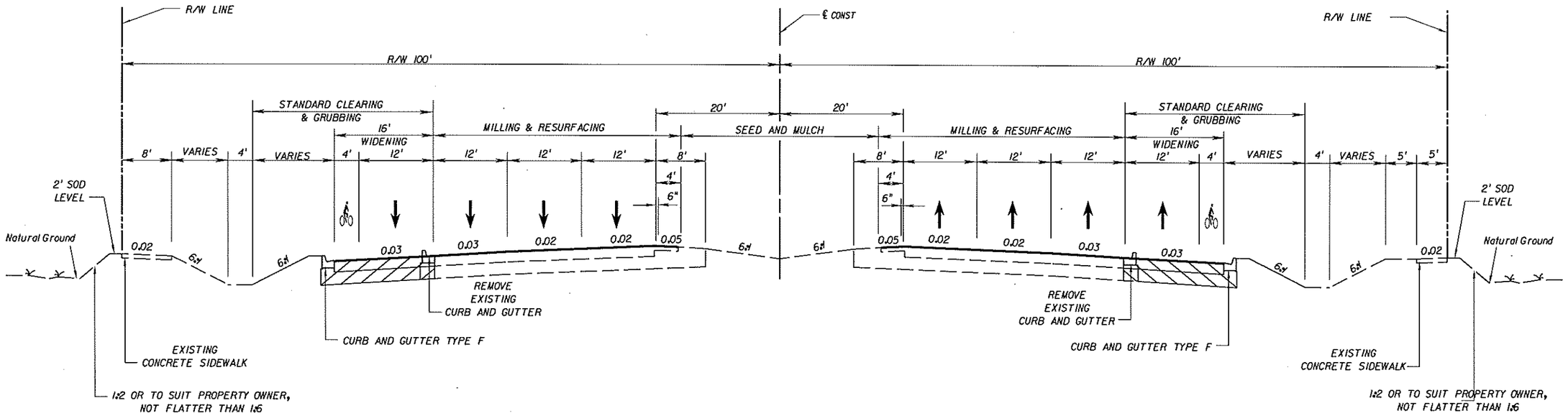
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID	412420-1-22-01	FEDERAL AID PROJECT NO.	N/A	COUNTY NAME	PALM BEACH
SECTION NUMBER	93220	ROAD DESIGNATION	SR 808	LIMITS/MILEPOST	MP 4.879 TO MP 6.309
PROJECT DESCRIPTION	Widening of SR 808 (Glades Road) from east of Renaissance Way to west of Oaks Medical Complex.				

PROPOSED ROADWAY TYPICAL SECTION



SR 808 (GLADES ROAD)

STA. 257+32.64 TO STA. 332+83.04

DESIGN SPEED = 45 MPH

TranSystems
2400 E. Commercial Boulevard
Suite1000
Fort Lauderdale, Florida 33308
(954) 653-4700

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
808	PALM BEACH	412420-1-22-01

GLADES ROAD TYPICAL SECTION

FIGURE NO. 1-4 (b)

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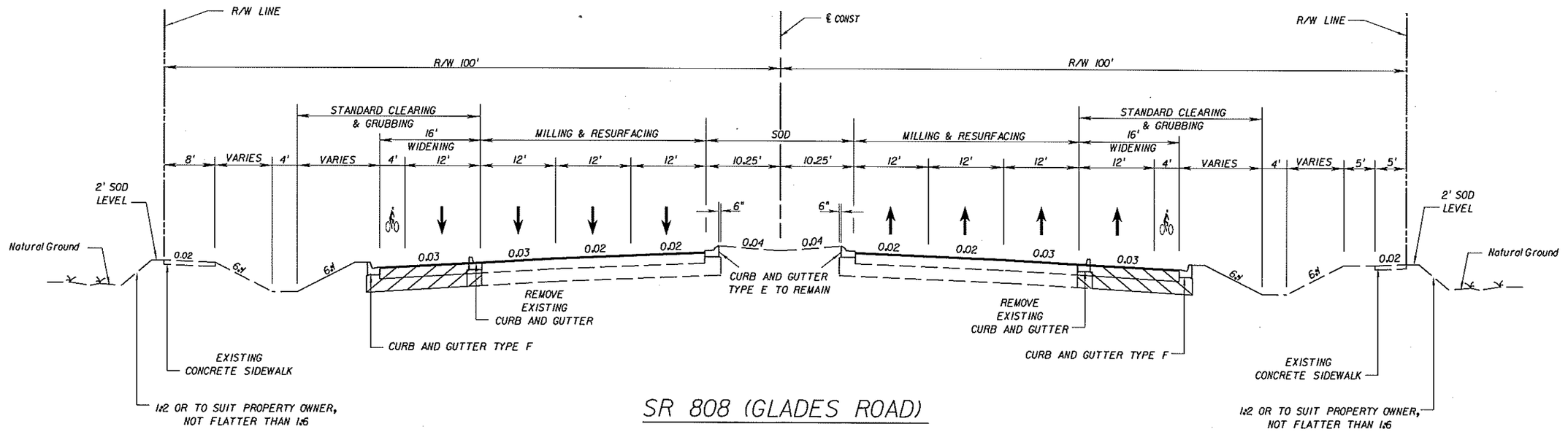
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID	412420-1-22-01	FEDERAL AID PROJECT NO.	N/A	COUNTY NAME	PALM BEACH
SECTION NUMBER	93220	ROAD DESIGNATION	SR 808	LIMITS/MILEPOST	MP 6.309 TO MP 6.680
PROJECT DESCRIPTION	Widening of SR 808 (Glades Road) from west Oaks Medical Complex to the El Rio (E-4) Canal bridge.				

PROPOSED ROADWAY TYPICAL SECTION



SR 808 (GLADES ROAD)

STA. 332+83.04 TO STA. 352+57.76

DESIGN SPEED = 45 MPH

TranSystems
2400 E. Commercial Boulevard
Suite 1000
Fort Lauderdale, Florida 33308
(954) 653-4700

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
808	PALM BEACH	412420-1-22-01

GLADES ROAD TYPICAL SECTION

FIGURE NO. 1-4 (c)

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CHAPTER 2
Existing Conditions

2.1 Functional Classification

The classification of I-95 is a state-maintained expressway. Interstate 95's operational classification is a Group One freeway in an urbanized area for FDOT generalized level-of-service analysis and a freeway for Highway Capacity Manual-based analyses. The functional classification of the crossroads for the project corridor is depicted in Table 2-1.

Two non-interchange crossroads are also included due to underpass/overpass structural impacts they are relative to the project. These are Spanish River Boulevard and Clint Moore Road.

TABLE 2-1
MAJOR CROSSROADS FUNCTIONAL CLASSIFICATIONS

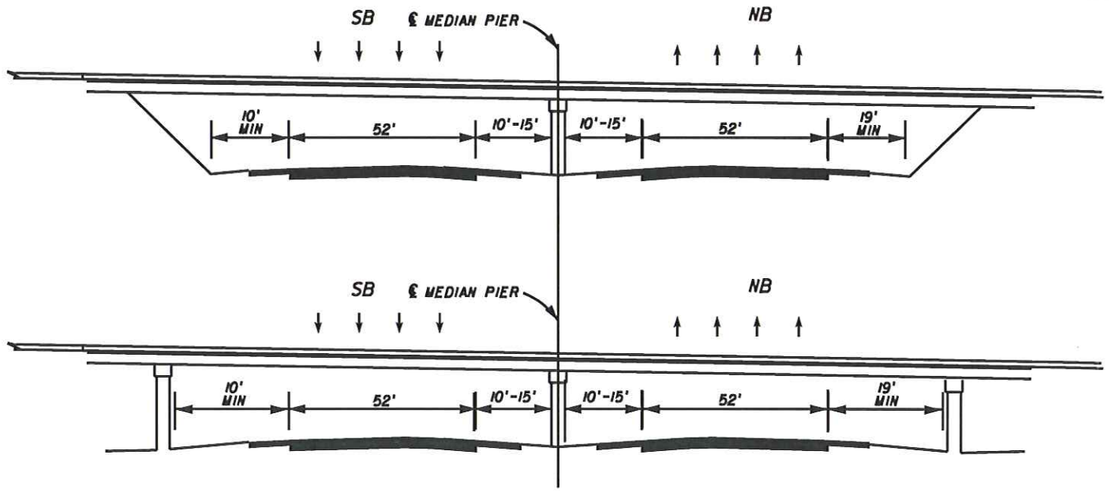
Overpass/Underpass	Functional Classification
Glades Road	State-Maintained Principal Arterial
Spanish River Boulevard	City-Maintained Urban Collector
Yamato Road (east of Military Trail)	State-Maintained Principal Arterial
Yamato Road (west of Military Trail)	State-Maintained Minor Arterial
Clint Moore Road (east of Congress Avenue)	County-Maintained Urban Collector
Clint Moore Road (west of Congress Avenue)	County-Maintained Minor Arterial
Congress Avenue Connector	County-Maintained Urban Collector

Source: TranSystems and Florida Department of Transportation (FDOT)

2.2 Typical Sections

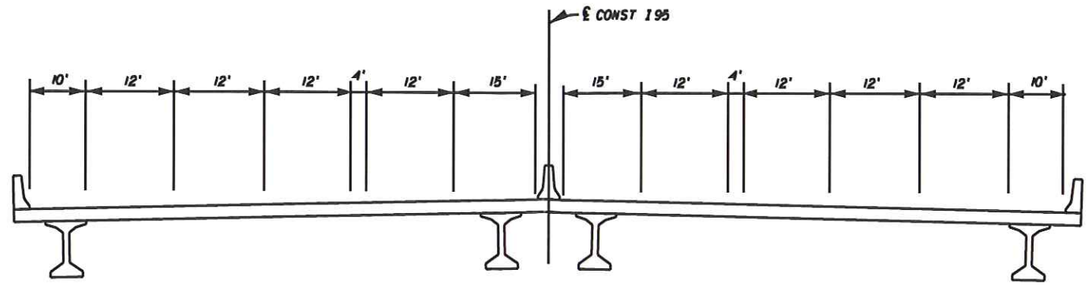
Mainline

The existing I-95 mainline typical section within the project limits consists of three 12' general use lanes (each direction) and one HOV lane (each direction) separated by a buffer. According to existing plans, the HOV buffer is four feet. However, the buffer measures less than four feet in various areas of the project, based on aerial review and field visits. Outside shoulders are 12' wide with ten feet of pavement. The section from Palmetto Park Road to just north of Clint Moore Road is separated by a barrier and generally has inside shoulders measuring less than the minimum allowable width of 14'. This is also based on field visits and aerial review. However, existing plans show a width of 15'. The inside shoulders measure 12' (ten feet paved), north of Clint Moore Road to near the end project limit. This section consists of a flared grass median that transitions back to a barrier separation at the end of the project, south of Linton Boulevard. The existing I-95 mainline typical sections per as-built plans are shown in Figure 2-1.



AT UNDERPASSES

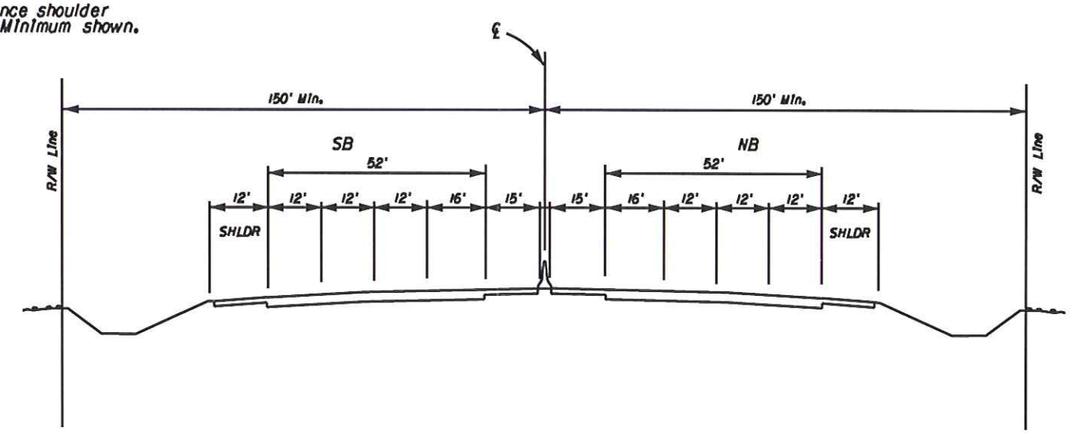
NOTE: Horizontal clearance shoulder dimensions vary. Minimum shown.

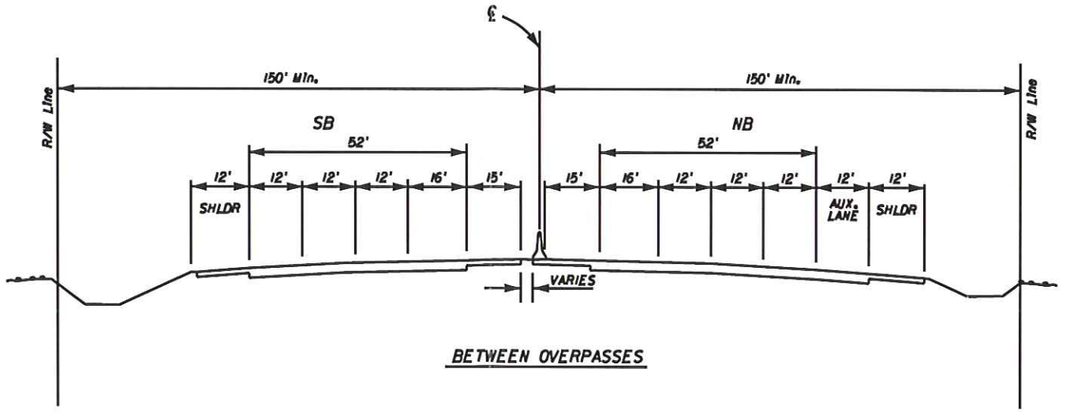


LEFT BRIDGE

RIGHT BRIDGE

AT OVERPASSES





BETWEEN OVERPASSES

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

TranSystems
2400 E. Commercial Blvd Suite 1000
Fort Lauderdale, Florida 33308
(954) 653-4700

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01 409355-3-2201

EXISTING CONDITIONS: HORIZONTAL ALIGNMENT

FIGURE 2-1

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Ramps

The three common types of ramps existing within the I-95 project study area are as follows:

1. **Slip Ramps** – Standard directional slip ramps have a 15' lane width and inside and outside shoulders of six feet in width. The inside shoulder has two feet of paved surface; the outside shoulder has four feet of paved surface.

2. **Loop Ramps** – The loop ramps found at the Glades Road/Yamato Road interchanges have a 15' lane width. The inside and outside shoulders measure six feet (four feet paved and two feet sod).

2.3 Pedestrian and Bicycle Facilities

Due to the fact that I-95 is a limited-access freeway, pedestrian and bicycle facilities are prohibited. Some means of pedestrian accommodation is provided by several of the crossroads. These are Glades Road, Spanish River Boulevard, Yamato Road, and Clint Moore Road. However, none of the crossroads provide designated bicycle lanes over or under I-95. Yamato Road contains undesignated three-foot bike lanes. Glades Road consists of undesignated bicycle lanes on the approaches to I-95 but not within the interchange. No pedestrian bridges exist within the project segment.

Table 2-2 provides details of the pedestrian and bicycle facilities as well as overall physical features of the crossroads.

TABLE 2-2
EXISTING CROSSROAD PHYSICAL FEATURES SUMMARY

Crossroad	Jurisdiction	Intersection Type with I-95	Minimum Right-of-Way	Typical Section	Pedestrian Facilities	Bicycle Facilities	Type Railroad Crossing
Glades Road	Boca Raton	Overpass Partial Cloverleaf	110' West of I-95, 200' East of I-95	Six Lane Divided	5' Sidewalk Eastbound	3' Undesignated Bike Lanes on Approaches to I-95	Overpass
Spanish River Boulevard	Boca Raton	Overpass	80' East of I-95, 120' West of I-95	Two Lane Not Divided	Westbound	None	Overpass
Yamato Road	Boca Raton	Underpass Partial Cloverleaf	120'	Six Lane Divided	Sidewalk Both Sides	3' Undesignated Bike Lanes	Protected At-Grade
Clint Moore Road	Boca Raton	Overpass	130'	Four Lane Divided	Sidewalk Both Sides	None	Overpass
Congress Avenue Connector	Boca Raton	Overpass T-Diamond Interchange	120'	Four Lane Divided	None	None	Overpass

2.4 Right-of-Way

The existing right-of-way (Limited Access) for the I-95 mainline from south of Glades Road to south of Linton Boulevard is 300'. The existing right-of-way for Glades Road from Butts Road to Renaissance Way is 110'. The right-of-way then flares out to a 200' section from Renaissance Way to just east of Florida Atlantic Boulevard.

2.5 Geometric Elements

This section provides information pertaining to cross sections, existing horizontal and vertical alignment, horizontal and vertical clearances, as well as design speeds.

Cross Sections

Table 2-3 provides a summary of the existing cross sections.

TABLE 2-3 I-95 EXISTING CROSS SECTIONS								
ROADWAY SEGMENT			NO. LANES	MEDIAN WIDTH	LANE WIDTH	CLEARANCE OUTSIDE	INSIDE SHOULDER	OUTSIDE SHOULDER
NO.	FROM	TO						
1	240+00.00	335+41.45	4	32'*	12'	82' min.	12'	12'
2	335+41.45	428+13.94	4	32' min.	12'	18' min.**	12'	12'

Note: *Barrier wall section, **Adjacent to auxiliary lane.
Source: FDOT Plans Project No.: 93220-3423 & 93220-3406.

Horizontal Alignment

Interstate 95's horizontal alignment generally runs north and south through Palm Beach County. The relative distance of I-95 to the Atlantic coast varies from approximately two to three miles. Within the project limits there are three horizontal curves. Using as-built stationing, these are located at P.I. Stations 139+43.02, 190+41.93 and 253+22.24. The minimum radius observed within the project corridor is 5,729.58'. Based upon horizontal curvature and superelevation, all three horizontal curves meet Department standards for an allowable design speed of 70 mph. Table 2-4 lists the existing horizontal geometry for the project segment.

TABLE 2-4 I-95 EXISTING HORIZONTAL ALIGNMENT					
ROADWAY SEGMENT			DEGREE OF CURVATURE	SUPER-ELEVATION (E)	ALLOWABLE DESIGN SPEED
NO.	FROM STATION	TO STATION			
1	116+33.35	149+56.27	01° 00' 00"	0.0039	70
2	176+02.32	204+23.15	01° 00' 00"	0.0039	70
3	245+00.00	261+33.33	01° 00' 00"	0.0039	70

Source: FDOT Plans Project No.: 93220-3423 & 93220-3406.

Vertical Alignment

The vertical alignment along the project's mainline varies with grades from -2.00 percent to +2.00 percent. There are several slight vertical curves within the project limits, along the right and left inside edge of pavement. Table 2-5 summarizes the mainline vertical alignment.

These curves are located north of the Spanish River Boulevard overpass. The standard vertical curves meet the minimum design criteria for 70 mph.

TABLE 2-5 I-95 EXISTING VERTICAL ALIGNMENT						
Roadway Segment			(a) Algebraic Difference in Grade %	Length of Curve (ft)	Calculated K Value	Allowable Design Speed
Curve No.	From	To				
1 - Sag	343+50.00	351+50.00	0.40	800	2,000	70
2 - Crest	356+50.00	366+50.00	1.6184	1,000	618	70
3 - Sag	368+00.00	376+00.00	0.6124	800	1,306	70

Source: FDOT Plans Project No.: 93220-3423 & 93220-3406.

Two sag curves are found within the I-95 project corridor have curve lengths of 800'. The Department's minimum standard for curve lengths for sag curves is 800'. The length of the crest curve has been identified to be less than the Department's allowable minimum of 1,800'. This substandard curve length could be lengthened with overbuild and special profiles, but a design variation is recommended to keep them as is. The minor difference achieved would hardly be perceptible to the driver. Also, the vertical curve at the bridge would be difficult to alter if at all possible with pavement work.

The most mentionable vertical curves occur off the mainline, at the Glades Road overpass over I-95. At this location, there are two sag and two crest curves. The first sag curve, approaching the overpass, has a "K" value of 115, which meets the Department's standards (design speed of 45 mph). Sag curves for a 45 mph design speed; require a minimum "K" value (ratio of minimum curve length over algebraic difference in grades) of 79.

The next vertical curve is a crest curve, and has a "K" value of approximately 49, which does not meet Department standards (design speed of 45 mph). Crest curves require a minimum "K" value of 98.

The next vertical curve is a crest curve on the north side of the bridge, and has a "K" value of approximately 66, which again, does not meet Department standards (design speed of 45 mph).

The final vertical curve is a sag curve, and has a "K" value of approximately 156, which does meet Department standards (design speed of 45 mph). Sag curves for a 45 mph design speed, require a minimum "K" value of 79.

2.6 Drainage

The existing roadway drainage system consists of roadside ditches, median drains, cross drains and two bridges. The ditches and drainage structures have been generally well maintained (except Cross Drain No. 8, see below) and a recent Resurfacing, Restoration, and Rehabilitation (RRR) project solved most of the erosion problems. There is one minor erosion problem remaining at the west end of Cross Drain No. 4, where the eroded soil has created a roadside hazard. These problems will be addressed when the culvert is extended for road widening and the end is replaced.

There are eleven cross drains and two bridges along the project. The cross drains vary in size from a 24 inch Reinforced Concrete Pipe (RCP) to a double nine-foot by seven-foot concrete box culvert.

The first cross drain is a 60 inch RCP located at Sta 419+31 (approximately 2,500' north of Palmetto Park Road). This pipe discharges into the Lake Worth Drainage District (LWDD) Lateral Canal L-47. The second cross drain is an eight-foot by four-foot Concrete Box Culvert. It is located at Sta 447+00 (approximately

1,200' south of Glades Road and provides drainage for the LWDD Lateral Canal L-46. The third cross drain is a 60 inch RCP located approximately 2,400' north of Glades Road. This pipe provides a connection for drainage on the northwest side of the Glades Road interchange with the relocated Airport Road Canal that was relocated east when I-95 was constructed. The Canal drains a portion of the Boca Raton Airport and flows south to the LWDD Lateral Canal 46.

The fourth cross drain along the project is a 24 inch RCP that drains a small area on the west side of I-95 between the roadway and the railroad tracks. This pipe eventually connects to the Airport Road Canal. The fifth cross drain is also a 24 inch RCP that performs a similar function as the fourth cross drain but is located a little further to the north (approximately 1,000' south of Spanish River Boulevard).

The sixth cross drain along the project is an eight-foot by four-foot Concrete Box Culvert for the LWDD Lateral Canal L-43. Although the LWDD vacated the Canal right-of-way prior to I-95 being constructed, and the Canal was terminated west of the roadway, the box culvert was still constructed. Since its construction, the culvert has become almost entirely filled with sediment. The City of Boca Raton currently owns the property vacated by the LWDD east of I-95.

The seventh cross drain along the project is a 24 inch RCP that serves to connect the east roadside ditch to the west roadside ditch. Drainage continues north to the LWDD Lateral Canal 40, which discharges into the El Rio Canal.

The eighth cross drain along the project is a double nine-foot by seven-foot Concrete Box Culvert for the LWDD Lateral Canal 40 (see photo of the culvert to the left). The internal wall between barrels exhibits impact damage. This will be repaired when the culvert is extended.

The ninth cross drain on the project is a 48 inch RCP that drains storm water from the west side of the interstate. This culvert has been included in a storm sewer system that also collects storm water along the southbound on and northbound off ramps for the Congress Avenue interchange. The storm sewer system also connects to a treatment pond and provides an outfall for the pond at its downstream end.

The tenth cross drain is a 48 inch RCP that receives water from a pipe under the railroad tracks just to the west and from the eleventh cross drain. Outfall from the tenth cross drain flows east about 300' in a lateral ditch east of the roadway and then turns south and flows approximately 2,000' and outfalls into the C-15 Canal.

The eleventh cross drain is a 36 inch RCP that receives storm water from a lake that was constructed as part of the Linton Center development, located on the east side of the roadway. Overflow from the lake enters the pipe through a 12 inch CMP. This cross drain also drains the east roadside ditch and discharges into the west roadside ditch. The storm water flows south in the ditch and into Cross Drain No 10.

TABLE 2-6: Tabulation of Existing Cross Drains

Culvert #	Station Location	Size and Material	Existing Length
1	119+30, 2500 ft N of Palmetto Pk Road	60 inch RCP	225 ft on skew
2	147+00, 500 ft S of Glades Road	8 ft by 4 ft CBC	328 ft on skew
3	182+95, 2200 ft N of Glades Road	60 inch RCP	232 ft
4	204+26, 4400 ft N of Glades Road	24 inch RCP	234 ft
5	230+30, 7000 ft N of Glades Road	24 inch RCP	204 ft
6	242+00, 300 ft N of Spanish River Blvd	8 ft by 4 ft CBC	353 ft on skew
7	323+00, 500 ft S of Clint Moore	24 inch RCP	212 ft
8	343+00, 1500 ft N of Clint Moore	Dbl 9 ft by 7 ft CBC	225 ft
9	378+00, 600 ft S of Congress O'pass	48 inch RCP	480 ft
10	417+75, 3200 ft S of Linton	48 inch RCP	268 ft
11	433+00, 1700 ft S of Linton	36 inch RCP	240 ft
Glades Rd	50+80, 500 ft E of Water Plant Entrance	72 inch RCP	230 ft

There is one cross drain under Glades Road that is within the limits of the project. It is a 72 inch RCP located about 500' east of the FAU Water Treatment Plant Entrance Road. This pipe was extended to be outside the right-of-way (on both sides) when Glades Road was improved in 1976. The extension and headwalls lie within a drainage easement. Since the improvements to Glades Road will be within the existing right-of-way, there will be no changes to the cross drain and no analysis is required.

The bridges along the project cross the El Rio Canal (Sta 267+50) and the C-15 Canal (Sta 397+10). The bridge over the El Rio Canal is at grade and is 120' long. The bridge over the C-15 Canal is also at grade and is 210' long.

2.7 Accident Data

Accident data provided by the Department for the I-95 and Glades Road project segments for the years 2006, 2007, and 2008 were analyzed. During the three-year study period (2006 - 2008), 1,008 and 490 crashes occurred within the I-95 and Glades Road study segments, respectively. These crashes resulted in a total of 1,169 injuries and 15 fatalities. Table 2-7 summarizes the crashes within the project segments of I-95 and Glades Road.

Crash rates were identified for three segments of the I-95 project corridor since each segment has a different Annual Average Daily Traffic (AADT) volume. The crash rate for each I-95 segment is identified by the following formula.

Crash Rate = (Number of Crashes x 1,000,000)/(AADT x 365 days/year x Number Years x Segment Length)

The three segments identified for I-95 are from MP 1.65 to MP 2.768 (approximately between south of Glades Road to Glades Road), MP 2.769 to MP 5.243 (approximately between Glades Road to Yamato Road), and MP 5.244 to MP 8.100 (approximately between Yamato Road to south of Linton Boulevard).[1] The AADT's associated with these three segments are 198,500, 186,000, and 197,500, respectively. Thus, the crash rates for these three segments are 0.72, 0.77, and 0.72, respectively.

[1] Crash analysis segments were extended to include the full segment which extends to the ramps at the Palmetto Park Road and Linton Boulevard interchanges.

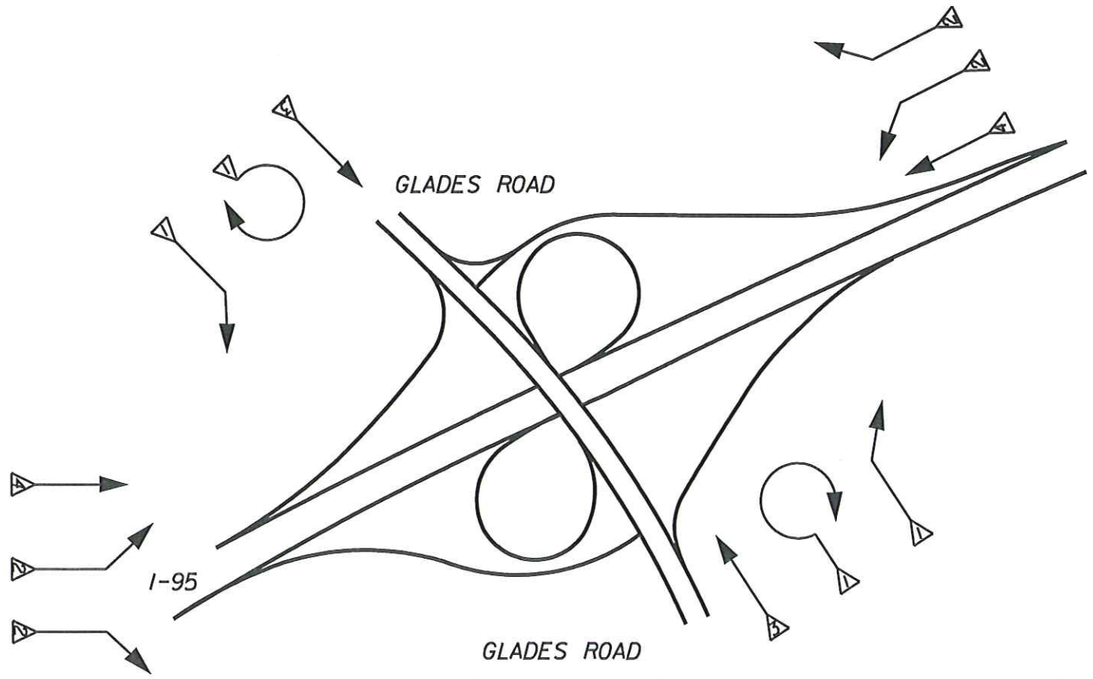
TABLE 2-7 CRASH SUMMARY											
For I-95	FATAL CRASH STATISTICS			INJURY CRASH STATS		PROPERTY DAMAGE	TOTALS			INFLUENCE CRASHES OCCURRING ON INTERSECTING	
YEAR	CRASH	FATALITIES	INJURIES	CRASHES	INJURIES	CRASHES	CRASHES	FATALITIES	INJURIES	AT INT.	INFL. AREA
2006	4	4	8	146	243	174	324	4	251	10	4
2007	4	4	3	145	264	208	357	4	267	11	5
2008	6	6	8	163	278	158	327	6	286	10	14
TOTAL	**14**	**14**	**19**	**454**	**785**	**540**	**1,008**	**14**	**804**	**31**	**23**
For Glades Road											
2006	0	0	0	72	118	88	160	0	118	11	4
2007	1	1	0	98	145	81	180	1	145	14	5
2008	0	0	0	67	102	83	150	0	102	9	6
TOTAL	**1**	**1**	**0**	**237**	**365**	**252**	**490**	**1**	**365**	**34**	**15**

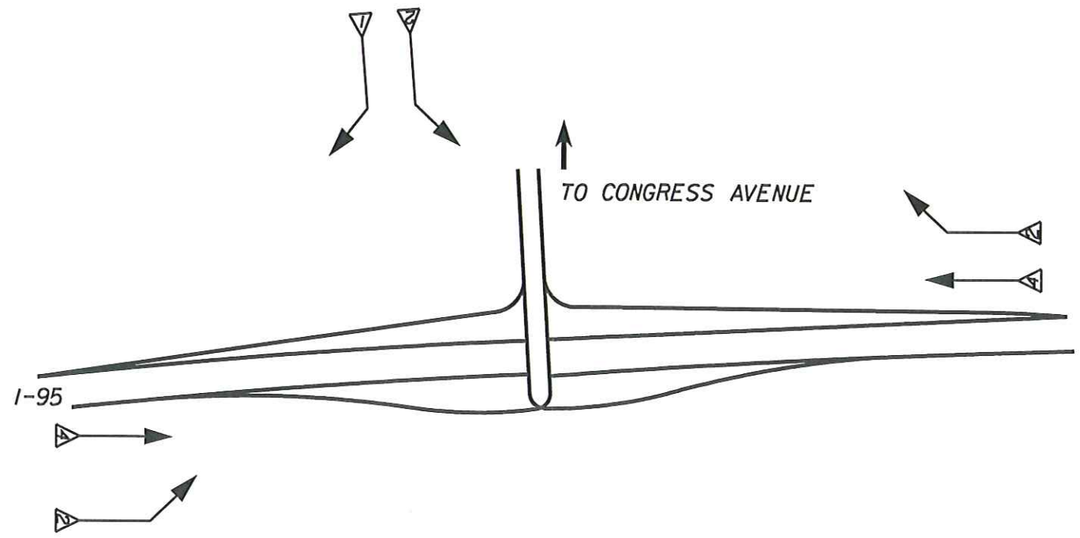
The economic losses due to mainline crashes were determined using crash costs specified by the Department. The Department gives an average cost per mile by facility type. For an interstate through an urban area, the average cost per crash is $73,805. Table 2-8 below shows the annual impacts that resulted to the Palm Beach County economy due to the I-95 crash totals.

TABLE 2-8 ANNUAL ECONOMIC IMPACT	
YEAR	ANNUAL IMPACT
2006	$23,912,820
2007	$26,348,385
2008	$24,134,235
3 YEAR TOTAL	$74,395,440

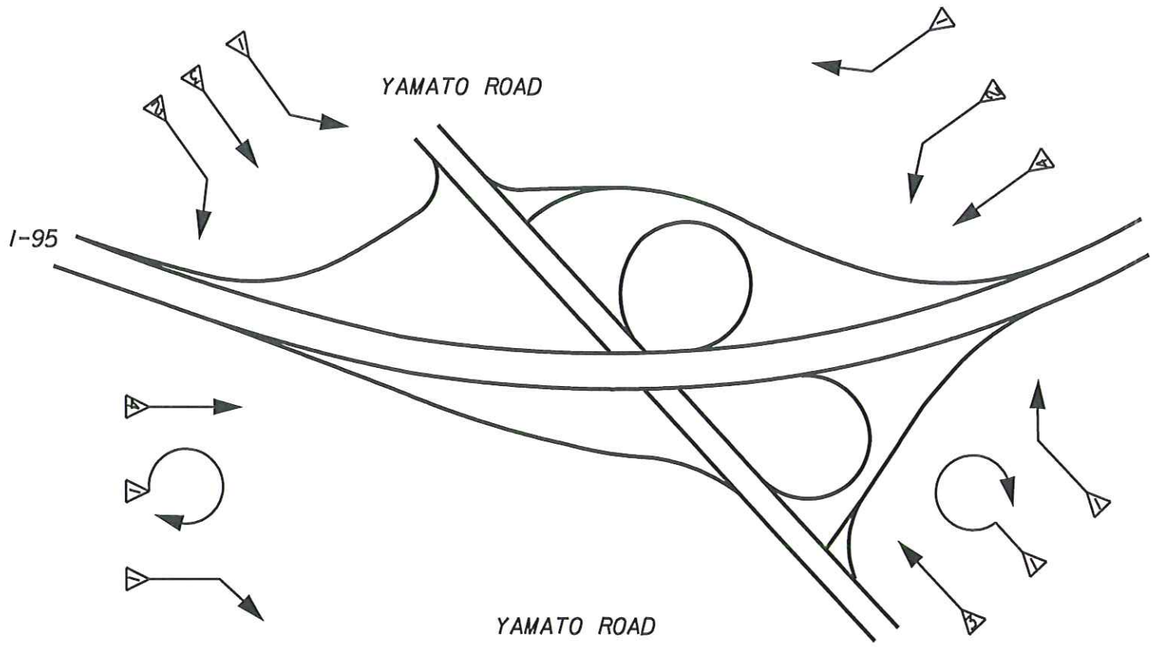
2.8 Intersection and Signalization

Figure 2-2 depicts the interchange layouts as well as existing laneage for the project corridor. Table 2-9 lists the general intersection features and signalization information for intersections that are signalized within the project limits.





CONGRESS AVENUE CONNECTOR



LEGEND

△ = NO. OF LANES

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

TranSystems
2400 East Commercial Blvd Suite 1000
Fort Lauderdale, Florida 33308
(954) 653-4700

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

PROJECT INTERCHANGES: EXISTING CONFIGURATIONS

SHEET NO. 2-2

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TABLE 2-9
EXISTING CONDITIONS: INTERSECTION AND SIGNALIZATION DATA

Intersection	Max. Level of Phasing	Signal Coordination	Length Cycle (secs)	All-Red (secs)	Amber (secs)	Special Features	Number of Through Lanes	Left Turns
I-95/Glades Road	Two Phase	Coordinated	130-180 AM & PM Peak = 180	1.0 E/W 2.0 NB & SB	4.0 all	Loop ramps EB to NB & WB to SB	Three WB Three EB	NB-Dual SB-Dual
I-95/Yamato Road	Two Phase	Not Coordinated	East 85-max. West 115-max.	2.0 All But EBLT, which=0	4.0 all	Loop ramps WB to SB & NB to WB*	Three WB Three EB	SB-Dual EB-Single
I-95/Congress Avenue Connector	Two Phase	NB & SB ramps on one controller-Not Coordinated	94-max.	2.2	4.5 all	Diamond Interchange With no East Approach	Two WB Two EB	NB-Dual EB-Dual
Glades Road/Butts Road	Four Phase	Coordinated	130-180 AM = 170 PM = 180	3.0 But E/W = 1.0	4.0 All	None	Three WB Three EB	WB-NB Dual EB-SB Dual
Glades Road/Renaissance Way	Four Phase	Coordinated	130-180 AM = 180 PM = 180	1.0 E/W 2.0 NB & SB	EB/WB = 4.3, NB/SB = 4.0	None	Three WB Three EB	WB-NB Single EB-SB Single
Glades Road/Airport Road	Four Phase	Coordinated	130-180 AM = 170 PM = 180	2.0 All	4.0 All	None	Three WB Three EB	WB-NB Dual EB-SB Single
Glades Road/NW 10th Avenue (FAU Main entrance)	Four Phase	Coordinated	120-160 AM = 150 PM = 160	2.3 – 3.1	LT = 4.0, All Other = 4.5	None	Three WB Three EB	WB-NB Dual EB-SB Single
Glades Road/Florida Atlantic Boulevard	Four Phase	Coordinated	120-160 AM = 150 PM = 160	2.3 – 3.1	LT = 4.0, All Other = 4.5	None	Three WB Three EB	WB-NB Single EB-SB Single

* Eastbound Yamato Road through movement is not signal-controlled on the eastside of I-95.
Source: Palm Beach County and TranSystems

2.9 Utilities and Lighting

The primary utilities within the corridor were identified through a detailed review of "as-built" plans for I-95 in Palm Beach County and standard utility coordination with the local utility companies. The existence of these utilities is partly due to roadway crossings, and continuing systems implemented prior to construction of I-95. A listing of the utilities found within the projects limits are shown in Table 2-10. Cable, sewer, water, electric, traffic communication, internet, fiber-optic, and telephone are some of the utilities found.

Table 2-10 Sunshine Ticket Utilities in Study Area	
Adelphia Business Solutions 2121 W. Prospect Road Fort Lauderdale, FL 33309	FPL Fibernet 9250 W. Flagler Street Miami, FL 33174
Adelphia - Communications 1401 Northpoint Parkway West Palm Beach, FL 33407	Florida Public Utilities Co 401 S Dixie Hwy West Palm Beach, FL 33401
City of Boca Raton - Traffic 201 W. Palmetto Park Road Boca Raton, FL 33432	MCI 2400 N. Glenville Richardson, TX 75082
City of Boca Raton Water Network 1401 Glades Road Boca Raton, FL 33432	Palm Beach County Traffic Operations 160 Australian Avenue West Palm Beach, FL 33406
City Of Delray Beach Water/Sewer Network 434 S. Swinton Avenue Delray Beach, FL 33444	Bellsouth 2021 S. Military Trail West Palm Beach, FL 33415
Florida Power & Light 4200 W. Flagler Street Miami, FL 33134	Fiberlight LLC. 22685 Holiday Park Dr., Suite 80 Sterling, VA 20166
Palm Beach County Finance Department 8100 Forest Hill Blvd West Palm Beach, FL 33413	Progress Telecom 100 2nd Ave South St. Petersburg, FL 33701
Emergia USA, Inc 6503 W. Rogers Circle Boca Raton, FL 33487	-

Source: Sunshine Ticket

Lighting is provided throughout the mainline of the I-95 corridor, and is generally located within the median of I-95. High-mast lighting is not provided along the mainline or at the interchanges. There is also lighting at the on and off-ramps composed of luminaries and ballasts mounted on DOT standard arms (Cobra style heads). The average spacing of lighting for on and off-ramps is between 200' and 240'. Overall, the lighting system is in good condition although a lighting analysis is recommended to determine compliance with Department standards. Likewise, Glades Road has a lighting system that will also require review and lighting analysis.

2.10 Pavement Conditions

The as-built drawings for I-95 in Palm Beach County were reviewed and showed that most of the project was originally built in the 1970's. Typical section sheets on those drawings show pavement characteristics that include ten inches of sub-base with twelve inches of base (LBR-40), which was standard for this project at the time.

An inspection of I-95's and Glades Road's pavement condition along the project segment was conducted by the Department and is summarized in the Interstate System Pavement Condition Forecast. The ratings were based on evaluations of the pavement's cracking, ride and rutting characteristics. The ratings for cracking, ride and rutting are based on a 1-10 scale. Ratings between seven and ten are considered good, five to seven are considered fair, and less than five are considered poor. The forecast values as provided by the report for the I-95 study segment show that cracking in 2009 is a 10, and that ride and rutting is 8.3 and 9.0,

respectively. The forecast values as provided by the report for the Glades Road study segment show that cracking in 2009 varies from 3.5 to 10, and that ride and rutting varies from 7.2 to 8 and 8 to 10, respectively. Table 2-11 below describes the existing pavement design for the project.

TABLE 2-11
EXISTING I-95 AND GLADES ROAD PAVEMENT DESIGN

Design		Location				
		I-95 Glades Road Interchange	I-95 North of Glades Road Interchange	I-95 Yamato Road Interchange	I-95 North of Yamato Road Interchange	Glades Road
BASE	Limerock Thickness	12"	10"	10"	10"	10"
	No. Courses	Double	Double	Double	Double	Double
	Primed	Yes	Yes	Yes	Yes	Yes
	Min LBR	40	40	40	40	40
STRUCTURE COURSE	Asphalt Spec	S-1	S-1	S-1	S-1	S-1
	Depth	3"	5"	5"	7.5"	2.5"
	No. Courses	Double	Triple	Triple	N/A	Double
	Top	1.5"	1.5"	0.0" (Milled)	1.5"	1.25"
	Middle	-	1.5"	1.5"	2.0"	1.25"
	Bottom	1.5"	2.0"	2.0"	4.0"	1.25"
SURFACE COURSE	No. Courses Top/Bottom	-	-	3	-	-
	Surface Course	-	-	Type S Overbuild	-	-
	Wearing Course	-	-	Type S	-	-
	Friction Course	-	-	FC-2	-	FC-2/FC-3

Source: FDOT Plans Project No.: 93220-3423, 93220-3406, 93004-3503, 93004-3507, 93004-3510, 93004-3518.

2.11 Existing Bridges

Along the I-95 project corridor, there are a total of three interchanges, two crossroads, two canal crossing overpass bridges, and two canal box culvert structures at the following locations:

- L-46 Canal – canal box culvert crossing
- Glades Road – overpass with interchange that consists of two loops
- Spanish River Boulevard – overpass with no interchange

- Spanish River Boulevard – crossing over the E-4 (El Rio) Canal
- E-4 (El Rio) Canal – canal crossing/I-95 overpass
- Yamato Road – underpass with interchange that consists of two loops
- Clint Moore Road – crossroad/overpass with no connection to I-95
- L-40 Canal – canal twin box culvert crossing
- Congress Avenue Connector – overpass with Diamond T-interchange
- C-15 Canal – canal crossing/underpass

Below is a description of the structures listed above.

I-95 Over the L-46 Canal

- The culvert draining the L-46 Canal is an eight-foot by four-foot concrete box culvert with a barrier wall inlet in the median. The median inlet is needed because the roadway is in superelevation and the southbound roadway is draining to the center. The box culvert is on a 12 degree skew and is 328' long with headwalls at each end and extends under the southbound on-ramp and northbound off-ramp at the Glades Road interchange. Riprap was also placed at each end of the culvert and extends to the right-of-way lines.

Glades Road Over I-95

- **Superstructure** - Glades Road splits into two separate bridges with similar geometry where it spans I-95. Four (4) lanes pass over each bridge, and each bridge has four simple spans – two 102'-1" sections over I-95 northbound and southbound, one 50' section at the west end of the bridge and one 33' section at the east end of the bridge. Type II beams are used as the inside girders for the short spans and Type IV beams were used for the 102' spans. For aesthetic purposes, Type IV beams were used as the outside girder on every span. The number of beams needed to support the deck decreases as the span length decreases; 11, nine, and seven beams support the 102'-1", 50', and 33' sections, respectively. The seven-inch thick deck that rests atop these beams has two concrete handrail barriers on either side and the southern bridge (Glades Road eastbound) also has an eight-inch thick sidewalk on the south side.

- **Substructure** - The superstructure is supported by concrete bents that are 3'-4" wide, 63' long, and a maximum of 4'-7" deep. They sit at an approximate skew of 77° with respect to the centerline of the bridge. The three columns that support each of these bents have a diameter of three feet and are 23'-3" apart (c. to c.). These columns sit on top of driven-pile footings, with seven to nine piles underpinning each footing. The piles supporting the short spans and the end bents are 18" square piles, and the piles supporting the center bent are 20" square piles. The end bents have an additional pile supporting the wingwalls on either side of the bent.

- **Access** - Glades Road has ramps for both eastbound and westbound traffic onto I-95, and I-95 also allows traffic onto both directions of Glades Road. The off-ramps from I-95 northbound and southbound are both governed by traffic lights, one slightly past each end of the bridge, but the on-ramps from Glades to I-95 are not signal-regulated.

Glades Road has one sidewalk on the south side of the eastbound bridge to allow pedestrians to cross I-95. From that sidewalk, pedestrians and bicyclists may either stay on the same side of Glades Road and walk to Boca High School (on the southeast corner), or they may cross the street and access the executive park (northwest corner), the airport, or the FAU campus (both on the northeast corner). The sidewalk allows pedestrian access to the neighborhoods and residential areas in the vicinity as well.

Glades Road has a minimum horizontal clearance of 30' and a minimum vertical clearance of 16'-4.625".

- **Condition -** Glades Road was built in 1974. In a bridge inspection report from 2004, it was judged to be in fair condition and was given a sufficiency rating of 97.

Spanish River Boulevard Over I-95

- **Superstructure -** Spanish River Boulevard is a ten-span bridge that crosses not only I-95, but also the Lake Worth Drainage District's (LWDD) E-3 ½ Canal, the CSX Railroad and Airport Road. With the exception of the two 120'-4" spans, all of the spans are simply supported and range from 120'-4" (across I-95 northbound and southbound) to 34'-9" in length. Since using the same beam type for this wide variety of spans would have been inefficient, the designers chose to use AASHTO Type II Beams for the spans under 50' in length, Type III Beams for the 62'-6" span between I-95 and Airport Road, and Type IV beams for the seven remaining spans (74'-3" to 120'-4"). All beams sit atop composite neoprene bearings and support a seven inch deck slab. Two (2) concrete barriers, and an 8 ½"-thick concrete sidewalk and handrail on the north side of the westbound lane. These barriers are arranged so that, although the two concrete barriers flank either side of the bridge, the sidewalk and handrail are on a ledge outside of the barrier. This provides a barrier between the traffic on the bridge and the pedestrians on the sidewalk, making the bridge safer for pedestrians. The total bridge length is 804'-3" and the total bridge width is 45'-9".

- **Substructure** - The substructure of the Spanish River Bridge consists of nine column bents and two end bents. The end bents are surrounded on three sides by concrete slope pavement and are 52'-6" long and 8'-9" high. The interior bents are 51'-6" long and vary in height from 4'-0" (supporting the smaller spans) to 4'-8" (supporting the larger spans). Both the end bents and the interior bents lie on a 55° 57' 41" skew. These interior bents sit on top of three three-foot diameter columns, and these in turn are upheld by driven-pile footings. The footings range in thickness from 3'-3" to 4'-3" and have between five and nine 18" square prestressed concrete piles beneath them. The same type of piles, support the end bents; each bent has nine piles along the face and two additional piles along each side to support the wingwalls.

- **Access -** Spanish River Boulevard allows both vehicles and pedestrians to access the roads to the east and west of I-95, but it is not connected to I-95. It does connect with Airport Road to the east of the I-95 Bridge, however. This connection allows traffic to access both the airport and adjacent residential areas.

  Spanish River Boulevard has minimum vertical and horizontal clearances of 17.81' and 30.62', respectively.

- **Obstructions** - Boca Airport is located to the southeast of the overpass, which means that any new construction in that area must meet Federal Aviation Administration (FAA) height requirements. There are also gopher tortoises located on the northeast corner, in the scrub habitat. The gopher tortoises are an endangered species but could be moved if absolutely necessary. The

same type of undergrowth is located in the southwest corner, and there are quite possibly more tortoises in that location as well.

- **Condition** - Spanish River Boulevard was built in 1974. In a bridge inspection report from 2005, it was judged to be in fair condition and was given a sufficiency rating of 95.2.

Spanish River Boulevard over El Rio Canal

- **Superstructure** - The Spanish River Boulevard Bridge currently serves traffic in the eastbound and westbound direction over El Rio Canal located east of I-95. The existing structure is a simply supported bridge with a span length of 60'-0" and an overall width of 91'-1". The bridge is symmetrical and facilitates a total of four 11'-0" lanes, two 4'-0" bike lanes, one 17'-0" median, and two 6'-6" sidewalks. Running along the outside of the bridge on both sides are 32" – F shape traffic barriers that rest atop the raised sidewalks. The superstructure consists of twelve prestressed FBT 30 beam units that are transversely post-tensioned. Additionally, the FBT beam units include a seven inch top flange acting as the deck.

- **Substructure** - The superstructure is supported on a substructure that consists of end bents supported on 13' - 18" prestressed concrete piles with a maximum spacing of 8'-4". An additional 18" pile is provided for supporting the wingwalls on each side of the end bents. The end bents also utilize precast anchor beams that tie back to anchor pile caps supported on 10"x30" anchor piles.

- **Access** - The Bridge facilitates access to FAU, east of I-95 and to residential areas in the vicinity. As previously mentioned, the bridge provides access to pedestrians and bicyclists on both sides of the bridge.

- **Condition** - The Bridge is a newly constructed structure built in the early 2000's. A fair assessment of the bridge is that it is in good condition due to its recent time of construction.

I-95 Over E-4 (El Rio) Canal

- **Superstructure** - The E-4 (El Rio) Canal Bridge superstructure is 120' long when measured along the centerline of I-95 and is divided into three 40' spans. Although the I-95 northbound and southbound bridges over the Canal were originally separate, widening was done to the inside of the bridges that added a travel lane in each direction, connecting the two bridges. Four (4) major travel lanes for both I-95 northbound and I-95 southbound now span the Canal, bringing the total superstructure width to approximately 175'. There is an auxiliary lane entrance ramp from Yamato Road to I-95 southbound that joins the bridge as it crosses the Canal. The bridge deck is eight-inches thick and has three concrete barriers on top of it; one barrier runs down the center of the bridge and the other barriers flank either side. Type II beams support the deck. Nine (9) beams run beneath the northbound side of I-95 and 12 beams run beneath the southbound side. As the ramp onto southbound I-95 merges with the main thoroughfare, however, those 12 beams reduce to 11 (the ramp does not actually merge with I-95 until a few hundred feet after the bridge ends).

- **Substructure** - Supporting the Type II beams are four pile bents, which sit at a skew of approximately 77° to the centerline of the bridge. They are three feet wide, three feet deep, and vary in length according to their location along the bridge. Each pier has 24 supporting piles and each end bent has slightly more (32 for the south end bent and 33 for the north end bent). The supporting piles are all 18" square pre-stressed piles, and a few are battered. Riprap surrounds the end bents on either side of the Canal.

- **Access** - The E-4 (El Rio) Canal is between Glades Road and Yamato Road along I-95. Both Glades and Yamato have on-ramps to I-95 northbound and I-95 southbound for vehicular traffic. Pedestrian traffic is prohibited both over and under the bridge; fences and dense undergrowth run along the banks to deter anyone from traveling underneath.

I-95 Over Yamato Road

- **Superstructure** - The I-95 Bridge over Yamato Road is a ten-lane divided bridge (five northbound lanes and five southbound lanes). Five (5) piers supporting four spans comprise the bridge. The spans, from south to north, are 55', 81'-7", 95'-11", and 50', and are supported by Type II, Type III and Type IV beams. The beams that support the two longer spans are Type IV beams, whereas Type III beams support the 55' span and Type II beams support the 50' span. Before widening, the exterior girders in all of the spans were Type IV beams for aesthetic purposes. When widening occurred, those girders remained, and more girders were added that matched the interior beams in the span. After that, the new outside girders (again, all Type IV's for aesthetic purposes) were placed. The bridge deck is 172' wide (post-widening) and 7" thick, and traffic barriers line the sides and the center. Since there is no non-motorized vehicle traffic on I-95, there are no sidewalks or bicycle lanes.

- **Substructure** - Three concrete bents make up each pier. Since two bents existed before the widening (one for I-95 northbound and one for I-95 southbound), the designer used the existing bents and designed one additional bent that fit the gap between the original two. This additional bent supported the two new lanes added during the widening. The designer also tried to match the design of the original bents; all of the bents are four-foot high and 3'-4" wide and lie on a 49° +/- 2° skew (the skew varies because I-95 curves as it goes over Yamato Road). The interior bents cap 3' diameter columns. The bents that existed before the widening each have four of these columns (spaced at 22'-4" apart), but the bents added during the widening only have three (spaced at approximately 20' apart). These columns are in turn supported by multi-pile spread footings. The pre-widening footings have six 18" square pre-stressed piles per footing, whereas the footings added during widening only have five. Most of the original piles are battered. The same type of pile also anchors the end bents.

- **Access** - Because it is a major highway, I-95 has no non-motorized vehicle access. However, cars, trucks, buses, and other motorized vehicles may access I-95 by using the access ramps that connect to it from either the eastbound or westbound travel lanes of Yamato Road. The eastbound and westbound lanes each connect to the northbound and southbound lanes of I-95. I-95 also does the same; the northbound and southbound lanes of I-95 each connect to the eastbound and westbound lanes of Yamato Road. Henceforth, this will be referred to as "free access", since traffic traveling on either road in either direction is in no way restricted from getting onto the other road in either direction.

  Though there is no pedestrian access to I-95, there are sidewalks on both sides of Yamato Road as it passes under I-95. This provides pedestrians with a way of getting to the residential neighborhoods on the east side of I-95 and the hotels on the west side. Many locals use these sidewalks as a fitness route for bicycling or running.

- **Condition** - The northbound and southbound I-95 bridges over Yamato road were built in 1973 and were reconstructed in 1993. The northbound and southbound bridges were given a sufficiency rating of 85.7 and 85, respectively, in a bridge inspection report from 2004. Both bridges were judged to be in poor condition. The horizontal clearance for the road is 8'-1". The minimum vertical clearance is 15'-6", which is sub-standard.

Clint Moore Road Over I-95

- **Superstructure** - The Clint Moore Road Bridge is the only bridge along the corridor that has a steel superstructure. It is 522'-2" long and 100'-9" wide when measured perpendicular to the centerline of the bridge. The deck is seven inches thick. Each side of the bridge has two travel lanes, a wide shoulder, a five-foot sidewalk, and a concrete handrail. A 12'-6" wide grass median divides the bridge and keeps cars from crossing into oncoming traffic lanes. Beneath the deck are twelve steel beams that cross both the CSX Railroad and I-95. A total of six spans accomplish this task, with the end spans being the shortest (57'-6" at the west end and 32'-6" at the east end), and the spans crossing I-95 being the longest (both are 134'-3"). The other two spans are 81'-10" long; one crosses the railroad and the other crosses the median between the railroad and I-95. The railroad lies just west of I-95. The beams that span the bridge are of varying heights and thicknesses, depending upon their location along the bridge. The beams that support the 32'-6" deck section are W27x84's, and the exterior beams are plate girders with a web thickness of 3/8" and height of 48". The top and bottom flanges are 9/16" thick and 12" wide. Though the top and bottom flange thickness does not change as the span length increases, all of the other thicknesses increase due to the heavier loads and longer span lengths being applied. The 57'-6" section has W30x99's as the interior beams, and the web thickness of the exterior beams is 7/16". Web height remains 48" in both of these spans as well as in the 81'-10" spans. In those spans, however, an additional 1/16" was added to the thickness of the web, making it ½" x 48". The flange plates are also different; instead of 9/16" x 12", they are 13/16" x 16". The amount of steel needed to support the 134'-3" spans is even more than that, with the flanges and webs of the exterior beams being 7/8" x 14" and 9/16" x 56", respectively. These beams are braced against torsion and buckling by a series of cross frames and diaphragms that run the length of the bridge.

- **Substructure** - The 12 beams lie across five concrete column bents and two end bents. All of the bents are skewed 48° with respect to the centerline of the bridge. Five (5) columns that are three-feet in diameter and 26' apart support each of the five column bents, but the end bents are supported directly by 18" square pre-stressed concrete piles. Each end bent is 120' long and has 21 piles spaced at six-feet on center underneath it. The wingwalls have one pile per wall for the west end and two per wall for the east end of the bridge. The pre-stressed piles also support the columns beneath the interior bents, each column having a footing with six to twelve piles beneath it.

- **Access** - Clint Moore Road has no direct connection with I-95, and there are no exits from I-95 to it. There are sidewalks on both sides of the bridge so that pedestrians can access the neighborhoods to the east and the office park to the west. It has a horizontal clearance of 30.05' and a vertical clearance of 16.32'.

- **Condition** - Clint Moore Road was built in 1974. In a bridge inspection report from 2004, it was judged to be in fair condition and was given a sufficiency rating of 90.6.

I-95 Over L-40 Canal

No plans are available for this structure. However, according to Straight Line Diagrams, this is a twin 7' X 9' concrete box culvert and is 288' in length.

Congress Avenue Connector Over I-95

- **Superstructure** - The overall length of the Congress Avenue Connector over I-95 is 259'-6". This

distance is divided into two spans, one 127'-3" span that crosses I-95 southbound and one 132'-3" span that crosses I-95 northbound. An eight-inch deck carries two lanes of traffic in both directions and sits on top of 12 AASHTO Type V beams. The deck has a concrete barrier on both sides and a median curb to prevent cars from crashing into oncoming traffic.

- **Substructure** - These beams are supported by three bents. Two of these are end bents, and one is a column bent. Three columns that are 3'-6" in diameter support the column bent. Beneath the columns are five-foot-thick footings that are supported by eight 18" prestressed piles. The same type of piles supports the end-bents, but the bents bear directly on the piles. Seventeen (17) piles support both the western and eastern bents, but the eastern one has two additional piles that uphold the wingwalls.

- **Access** - This intersection is a "free access" intersection for motorized vehicles. Since there is no pedestrian traffic allowed on I-95, and since the Congress Avenue Connector does not connect to any residential or business area on the east side of I-95, there are no sidewalks that traverse it. It serves only vehicular traffic. Minimum horizontal and vertical clearances are 36.21' and 23.63', respectively.

I-95 Over C-15 Canal

- **Superstructure** - The superstructure of I-95 over the C-15 Canal consists of nine spans of 15" thick deck. The deck is 210' long and 121' wide across the northbound portion of I-95. The southbound bridge is also 210' long but has a width of only 77'-2". Both decks are 15" thick, but the southbound deck added a two-inch overlay during widening. Concrete barriers run along both sides of the deck for the entire length of the deck. The deck rests directly on top of the ten bents that support it. No beams are used in this bridge.

- **Substructure** - There are ten bents supporting each bridge. The bents that carry the northbound traffic each have eleven 18" square pre-stressed concrete piles that support them. The spacing of these piles range from 11'-3" to 12'-4", with the wider spacing being at the south end of the bridge. Both the intermediate bents and the end bents are three-feet wide by 2'-6" high. Riprap surrounds the end bents on both sides of the Canal. No data for the substructure of the southbound bridge is available.

- **Access** - There is no non-motorized vehicle access across this bridge. Fences were erected along both banks of the Canal for the purpose of keeping people out from under the bridge.

- **Condition** - The bridges over the C-15 Canal were built in 1993. In the bridge inspection report from 2005, they were judged to be in fair condition and were given a sufficiency rating of 93.8 and 99.2 for the northbound and southbound lanes, respectively. The minimum horizontal clearance is 22', and the minimum vertical clearance from the lowest point of the superstructure to the design high water level is 4.4 feet.

The horizontal clearance standards for freeways with a 70 mph design speed are as follows:

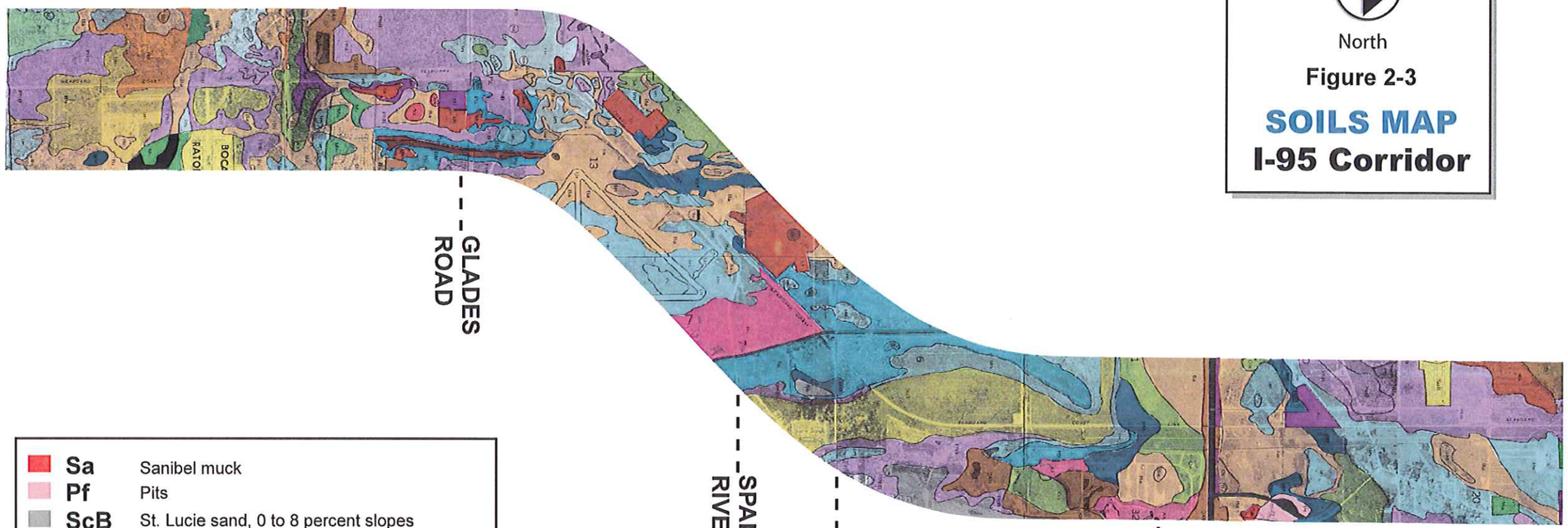
- 12' from the edge of a travel lane to the face of guardrail
- 24' from the edge of an auxiliary lane to the face of any fixed object
- 36' from the edge of a general use lane to the face of any fixed object

2.12 Geotechnical Data

A United States Geological Survey (USGS) Soil Survey for Palm Beach County was obtained from the United States Department of Agriculture to review the existing soils within the project limits. Review of these maps indicated there are 17 types of soil identified adjacent to the project corridor which are listed below:

Arents-Urban Land Complex
Basinger Fine Sand
Basinger – Urban Land Complex
Basinger and Myakka Sands, depressional
Boca Fine Sand
Myakka – Urban Land Complex
Okeelanta Muck
Pahokee Muck
Pineda Sand
Pits
Pomello Fine Sand
Pompano Fine Sand
Quartzipsamments, shaped
Sanibel Muck
St. Lucie Sand (zero to eight percent slope)
St. Lucie – Urban Land Complex
Urban Land

Portions of the I-95 project segment were found to have hydric soils, primarily Basinger Fine Sand (Ba) and Basinger and Myakka sands, depressional (Bm). However, it is possible that the hydrology of the soils may have changed due to urbanization of the surrounding area following the date of the survey. Hydric soils in the area may effect engineering plans made for the mainline and interchange "Build" alternatives. Refer to Figure 2-3 - Soils Map for a more descript view of the soils.



North

Figure 2-3

SOILS MAP
I-95 Corridor

Sa	Sanibel muck
Pf	Pits
ScB	St. Lucie sand, 0 to 8 percent slopes
Ur	Urban Land
Au	Arents-Urban Land Complex
Pa	Pakokee muck
Po	Pompano fine sand
Im	Immokalee Fine Sand
Mu	Myakka-Urban land complex
AX	Arents-Urban land complex, Organic substratum
BM	Basinger and Myakka sands, depressional
PhB	Pomello fine sand
BO	Boca fine sand
Ba	Basinger fine sand
Pd	Pineda sand
SuB	St. Lucie-Urban land complex
On	Okeelanta muck
QAB	Quartzipsamments, shaped
Bc	Basinger-Urban land complex

CHAPTER 3
Planning Phase and Corridor Analysis

The previous I-95 PD&E Study, from Linton Boulevard to Indiantown Road, evaluated I-95 in addition to five other corridors which could reasonably be considered as alternatives to widening I-95 through Palm Beach County. These corridors included the South Florida Rail Corridor, Florida's Turnpike, Military Trail, Congress Avenue, and US 1. These facilities are parallel limited access, or uncontrolled-access arterial roadway facilities and rail corridors to the east and west of the I-95 corridor. For this study, the SR A1A corridor and the Dixie Highway corridor were added to the list of alternative corridor candidates. The locations of these alternatives are shown in Figure 3-1. For the reasons provided in the sections that follow, each of the alternatives to I-95 was rejected and improvements within the existing I-95 corridor were deemed to be the most appropriate location for corridor-wide capacity enhancement.

3.1 Evaluation of Alternate Corridors

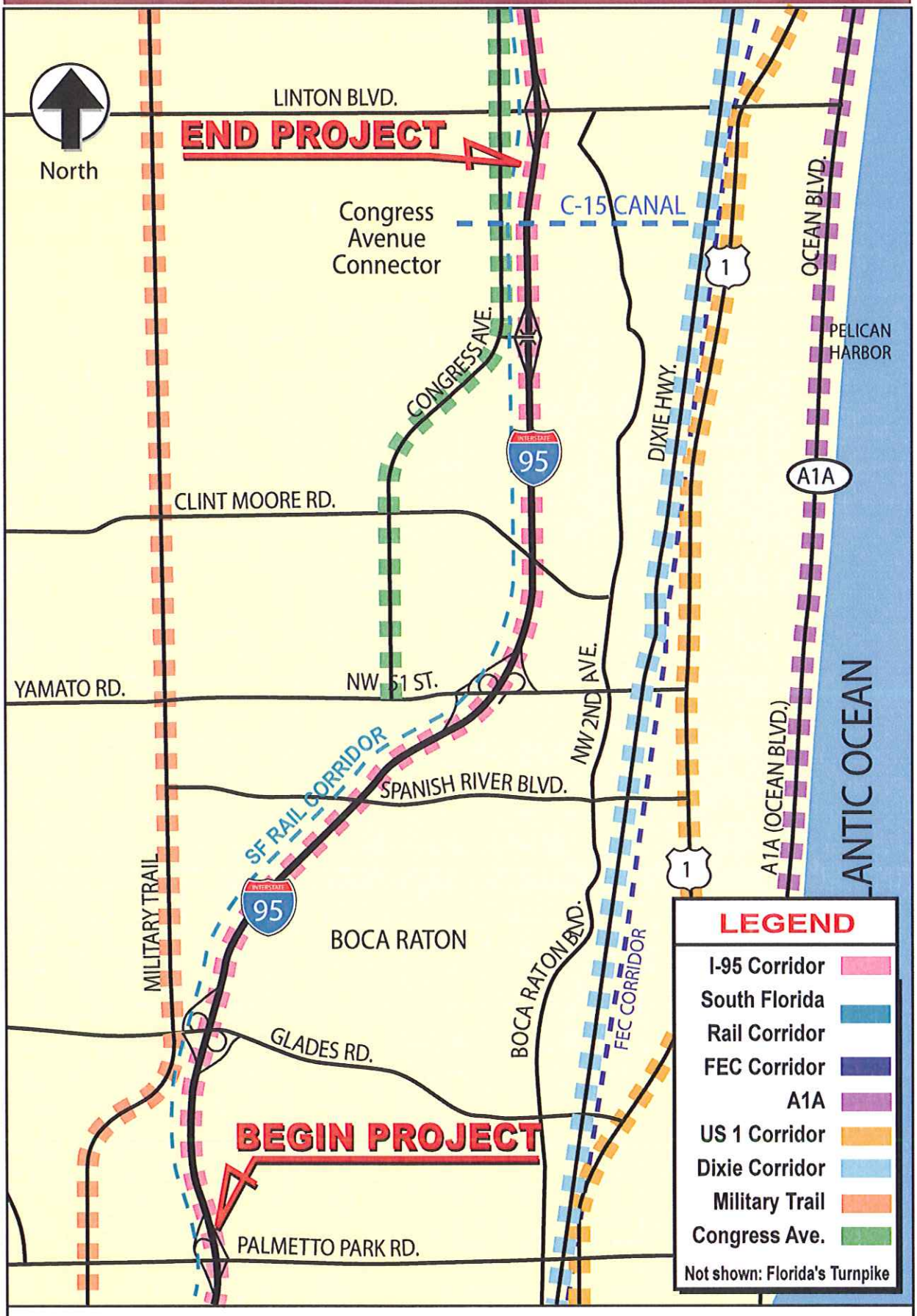
An evaluation of each corridor is provided in the sections that follow.

3.1.1 South Florida Rail Corridor/CSX Rail Line

The CSX Rail Line parallels I-95 from SR 826 in North Miami to immediately north of the Belvedere Road interchange, where it veers to a northwesterly course. Through the southern and central portions of Palm Beach County the CSX Rail Line lies approximately 200' west of the centerline of I-95. South of Belvedere Road, the railroad and I-95 separate, then veer toward each other, crossing between the Belvedere Road and Okeechobee Boulevard interchanges. The CSX Rail Line moves to the east side of Clear Lake and Lake Mangonia through West Palm Beach. Interstate 95 lies west of the lakes. Interstate 95 again crosses over the CSX Rail Line, together with Beeline Highway (SR 710), approximately 0.75 miles south of the Blue Heron Boulevard interchange. The CSX Rail Line follows a northwest-southeast alignment through the northern portion of Palm Beach County and does not parallel the I-95 corridor north of SR 710. Therefore the CSX Railroad corridor does not represent a viable alternative corridor when viewed in the context of inter-county travel in northern Palm Beach County, from SR 710 to the north. The market shed served by the I-95 project does not overlap the CSX or South Florida Rail Corridor market shed on an interstate or intrastate basis. Therefore, though previously included in other corridor studies of I-95, the South Florida Rail Corridor cannot be viewed as a viable alternative for the I-95 corridor for inter-county travel to the north.

Even under optimum assumptions and providing for maximum diversion of passengers from I-95 highway usage to commuter rail, and using 100 percent peak hour load-factors for Amtrak and Tri-Rail, there would not be sufficient modal diversion to eliminate the need for capacity improvements to the highway component of the I-95 corridor. The future demand for travel within the I-95 corridor exceeds all off-project available capacity. The operation of the commuter rail system means that the I-95 corridor will enjoy the advantages of modal choice and added passenger throughput. This will enable a greater percentage of the total corridor travel demand to be met. However, the large majority of additional vehicular and passenger demand will remain to be satisfied, in large part, within the highway element of the overall multimodal I-95 corridor. It should be noted that the term "highway element" in this context also includes HOV lanes and park-ride facilities, too.

I-95 PD&E Study



Alternate Corridors **Figure 3-1**

3.1.2 Parallel Highway Facilities

Florida's Turnpike (SR 821)

Florida's Turnpike is the only north-south arterial through Palm Beach County, which is truly comparable to I-95 as a limited-access facility. However, the Turnpike ranges in distance from 3.0 to 5.0 miles west of I-95 throughout much of southern and central Palm Beach County. In the northern part of Palm Beach County, the Turnpike right-of-way actually abuts I-95's right-of-way, making it a reasonably competitive route in northern Palm Beach County. A close examination of the market shed served by the Turnpike and I-95, however, places the Turnpike's market considerably west of the highest concentration of both residential and employment centers, which are more effectively served by I-95 in southern Palm Beach County. The Turnpike's widely-spaced interchanges also fail to serve the short-haul travel market that is served in the I-95 corridor. North of the subject project, the US 1 Corridor Study (in Martin/St. Lucie Counties) tested additional interchanges on the Turnpike, using the Treasure Coast Regional Planning model, in an attempt to attract/divert traffic from US 1. The results were marginal, and very few trips diverted to the Turnpike. This reinforces the notion that the Turnpike serves a long-haul market that does not overlap US 1 and/or I-95 market sheds to any significant degree. In addition, the Turnpike serves the central Florida market from a statewide perspective while I-95 serves the heavily urbanized east coast of Florida. For these reasons, Florida's Turnpike was not considered a viable alternative corridor for the I-95 travel market.

Military Trail (CR 809)

Military Trail is the only north-south arterial lying between Florida's Turnpike and I-95, which extends from the Broward County line, terminating at Indiantown Road. It is a six-lane principal arterial where it underpasses I-95 at Glades Road just north of PGA Boulevard. Moderate levels of access control have been provided by limiting curb and median cuts to adjacent properties. Just north of PGA Boulevard, the I-95 alignment shifts to the west, passing over Military Trail.

The maximum cross-section of six lanes, permitted under FDOT policy, has already been constructed through portions of Military Trail. In addition, signalized intersections reduce the capacity of Military Trail when compared to a grade-separated, limited-access facility such as I-95. Current traffic projections for Military Trail for the year 2030 show very heavy volumes just north of Glades Road. These volumes exceed the maximum service volume which can be achieved on typical six-lane Group "A" arterials for level-of-service "D".

Any additional volumes diverted from I-95 to Military Trail would push level-of-service conditions to less than acceptable levels. The market shed served by Military Trail terminates at Indiantown Road, while I-95 serves a vast market to the north of this limit. The two markets are very dissimilar. Therefore, Military Trail was not pursued as a viable alternative corridor.

Congress Avenue (SR 807)

The remaining north-south facility west of I-95, in Palm Beach County, which could be considered as an alternative corridor to I-95, is Congress Avenue. Several factors preclude Congress Avenue from being retained for more serious study.

- **Length** - Congress Avenue only extends as far north as 45th Street, and, therefore, does not serve Martin County and regions to the north. It also terminates at Yamato Road on the south, failing to serve southern Palm Beach County and regions to the south.

- **Collector** - Congress Avenue is an urban collector facility, not an arterial. It has a higher

priority to provide access to adjacent properties than does an arterial and, as such, has a lower per-lane service volume than does an arterial.

- **State Maintenance** - As an urban collector, Congress Avenue is not a state-maintained facility.

The last factor is significant. For the Department to use this facility as a reliever to I-95, it would be necessary to upgrade the highway to State standards throughout the project length, in addition to providing additional through lanes to accommodate the increased demand diverted from I-95. With the low per-lane capacity of an improved and widened Congress Avenue, coupled with its inability to provide a parallel alternate route for long-distance travel over the entire limits of the I-95 corridor, Congress Avenue was not pursued as a viable alternate corridor.

Dixie Highway (SR 811)

This typical section consists of four lanes, generally, and operates at or slightly below capacity. Dixie Highway is not an interstate facility, but it does have good inter-county continuity, with a few exceptions. In some areas, it operates as a one-way pair (i.e. Pompano Beach). This facility, however, is constrained by its capacity, its right-of-way and abutting land-uses, making it unacceptable as an alternative corridor that could significantly divert traffic from the heavily-congested I-95.

US 1 (SR 5)

The US 1 corridor is also referred to as US 1, Federal Highway, Broadway, Dixie Highway, and Olive Avenue at different locations within Palm Beach County. It is one of three State-maintained north-south principal arterials lying between I-95 and the Intracoastal Waterway. The US 1 typical section varies from a four-lane divided facility at the northern and southern ends of the County to a six-lane divided, or two three-lane one-way sections through other parts of the County. The US 1 corridor is the central north-south business route through many of the eastern cities such as Delray Beach, Boynton Beach, Lake Worth, West Palm Beach, Riviera Beach, and Jupiter. As such, it is heavily built up with commercial and retail properties. Signal spacing is very close through much of the corridor, further reducing capacity and the utility of the facility. The US 1 corridor was deemed an unfeasible alternative corridor because of the very limited additional traffic volume which could be added in the existing built-up corridor. The cost of expanding the facility would be impractical due to the cost of right-of-way and business damages that would be needed to implement a widening plan in a fully developed commercial corridor.

SR A1A (Ocean Boulevard)

The SR A1A corridor suffers from many of the same difficulties as the US 1 corridor. This corridor generally serves the barrier island, oceanfront communities along the beach adjacent to the Atlantic Ocean. To a degree, SR A1A is discontinuous in that it meanders westward, connecting with and combining with US 1 in order to bypass selected inlets separating the barrier islands. Such is the case for a distance between PGA Boulevard and a point south of Donald Ross Road, where SR A1A shares the US 1 designation, before bifurcating again. The same thing occurs at the Port Everglades inlet, where SR A1A "diverts" to US 1 via the SE 17th Street Causeway and Dania Beach Boulevard. Since SR A1A and US 1 must share the same right-of-way in different parts of Palm Beach and Broward Counties, SR A1A has the same capacity problems that US 1 does. Where the two facilities combine into a single right-of-way, the capacity problem is exacerbated.

Couple this with the fact that SR A1A is a discontinuous and remote facility, east of US 1, and SR A1A becomes a candidate for rejection as a viable alternative to I-95. For these reasons, SR A1A was discarded from further consideration.

3.2 Evaluation Matrix

A formal evaluation matrix was prepared (see Table 3-1) for the corridor study element of the I-95 project. An evaluation of the technical feasibility of these corridors to accommodate a significant portion of the demand in the I-95 corridor was discussed, in detail, in Section 3.1: *Evaluation of Alternate Corridors*. The matrix analysis clearly shows that I-95 is superior, in almost every category, to every other corridor alternative. In the rare case the other alternative might "match" I-95 under one criterion, that same alternative often "loses" and is clearly inferior, in most or several other categories. It is clear that I-95 is, by far, the best corridor to satisfy predicted corridor traffic demand and the long trip lengths associated with interstate travel.

3.3 Selection of Viable Alternative Corridors

An evaluation of each of the six alternative corridors presented in Section 3.1 shows that no viable alternative to I-95 exists in the overall north-south corridor that could physically or operationally accommodate the anticipated forecast traffic demand. Therefore, this report evaluates improvement options to I-95 only. However, possible improvements to facilities and services within the alternative corridors are not dismissed and such improvements, consistent with the MPO's *LRTP* should be encouraged to provide increased mobility within the overall project corridor and to reduce the demand on I-95, to the extent possible. The traffic forecasts for this project assume that the off-project improvements in the MPO's *Cost Feasible Plan* will be implemented.

TABLE 3-1 ALTERNATIVE CORRIDORS MATRIX ANALYSIS								
Evaluation	Alternative Corridors							
CRITERIA	I-95	South Florida Rail Corridor	Florida's Turnpike	Military Trail	Congress Avenue	US 1	Dixie Highway	SR A1A
Interstate Route?	Yes	Yes	No	No	No	Yes	No	No
Inter-county Route?	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Continuity of Route	Good	Good	Good	Good	Poor	Good	Good	Poor
Significant right-of-way and Capacity Available for reasonable cost?	Yes	No	Yes	No	No	No	No	No
Utilization	Good	Poor	Fair	Good	Good	Good	Fair	Fair
Serves I-95 market sheds?	Yes	No	No	No	No	No	No	No
Effectiveness as Reliever to I-95	Excellent	Poor	Fair	Poor	Poor	Poor	Poor	Poor
Proximity to I-95	Excellent	Poor	Fair	Good	Good	Fair	Poor	Poor
Freeway Capacities Available?	Yes	No	Yes	No	No	No	No	No
EVALUATION								
No. "Positive" Grades	9	3	4	4	2	4	2	1
No. "Negative" Grades	0	6	2	5	7	4	6	7
No. "Fair" Grades	0	0	3	0	0	1	1	1
Overall Ranking	1	5	2	4	6	3	7	8

CHAPTER 4
Project Design Standards

The "Build" alternative is based on current design standards and criteria. Standards and criteria used in the previous I-95 HOV lane, mainline, and interchange studies conducted in the Tri-County area have also been examined and evaluated. Current information on new advances in engineering analysis and technology were also used for the development of the "Build" alternative.

4.1 ROADWAY

Roadway engineering criteria were based on the Department's *Project Development and Environment (PD&E) Manual* and the *Roadway Plans Preparation Manual (PPM)*. Other primary references used for roadway design standards are listed below.

- *Roadway and Traffic Design Standards*, State of Florida: Florida Department of Transportation, 2010
- *A Policy on Geometric Design of Highways and Streets*, American Association of State Highway and Transportation Officials (AASHTO), 2004
- *Roadway Plans Preparation Manual*: Volume 1 Design Criteria and Process, Florida Department of Transportation, January 1, 2009 update
- *Manual on Uniform Traffic Control Devices for Streets and Highways*, Federal Highway Administration (FHWA), 2009 Edition
- *Highway Capacity Manual*
- *FDOT Structures Design Guidelines*
- *FDOT Drainage Manual*
- *FDOT Interchange Development and Review Manual*

The need for proper lane and median widths, bridge and roadway shoulder widths, horizontal curvature, superelevation, horizontal clearances, grades, and vertical clearances have been considered as well as design speeds and levels-of-service. Some roadway standards and criteria apply to all three types of roadway conditions within the project segment; mainline, interchange area entrance and exit ramps, and crossroads. Others vary according to the roadway type. The roadway design criteria used in the development of the "Build" alternative is listed on Table 4-1.

TABLE 4-1
ROADWAY DESIGN CRITERIA

ROADWAY TYPE		DESIGN SPEED	LEVEL-OF-SERVICE	LANE WIDTH	SHOULDER INSIDE	SHOULDER OUTSIDE	MEDIAN WIDTH	HORIZONTAL CLEARANCE	VERTICAL CLEARANCE	DEGREE (Dmax)	RADIUS	e	MAX. GRADE	STOPPING SIGHT DISTANCE	K / V.C. LENGTH (min.) CREST	K / V.C. LENGTH (min.) SAG
MAINLINE		70 MPH	E[i]	12'	14'	12'	26' MIN.[a] 64' [b]	36' [h]	16'-6" [g]	03°30'00"	1,637'	0.1	4%	820' [f]	506 / 500'	206 / 400'
I-95 ENTRANCE AND EXIT RAMPS	FLYOVERS AND DIAMOND TYPE INTERCHANGES	30 MPH	E[i] Ei	15' [d] 24'	6' 8'	6' 10'	N/A N/A	10'	16'-6"	24°45'00"	260'	0.1	5% to 7%	200'	N/A	N/A
		45 MPH	E[i] Ei	15' [d] 24'	6' 8'	6' 10'	N/A N/A	14'	16'-6"	10°15'00"	560'	0.1	4% to 6%	360' [c]	98[e] / N/A	79[e] / N/A
	LOOP CONNECTIONS	30 MPH	Ei	15' 24'	6' 8'	6' 10'	N/A	10'	16'-6"	24°45'00"	260'	0.1	5% to 7%	200'	N/A	N/A
BRIDGE SECTION		70 MPH	E[i]	12'	10'	10'	N/A	10'	16'-6"	03°30'00"	1,637'	0.1	3%	820'	506 / 500'	206 / 400'
CROSSROAD		45 MPH	D	12'	10'	10'	19.5'	14'	16'-6"	10°15'00"	637'	0.1	5% 6%	360' [c]	98[e] / N/A	79[e] / N/A

Source: FDOT Plans Preparation Manual - 2007 update

Notes:

Median Width:
a - Based on two foot median barrier and two 12' shoulders
b - 88' when future lanes planned

Stopping Sight Distance:
c - Based on average speed of 45 mph
f - Length of crest vertical curves on interstate mainlines are not to be less than 1000' for open highways and 1800' within interchanges

Lane Widths:
d - Ramp widths vary from 15' min. to 23' depending on radius

"K" Values
e - Based on 45 mph arterials

Vertical Clearance for Bridge Structure Underpass
g - Includes future underpass resurfacing (six inches over pavements)

Horizontal Clearance for Bridge Structure Underpass
h - Horizontal clearances based on highway with flush shoulders

LOS
i - E is exceptable since Tri-Rail is present adjacent to the corridor.

I-95 Border Width (Standard): 94-ft

I-95 Roadway Cross Slopes: 0.02/0.03

In the development of the HOV lane treatments, other documents were evaluated. A number of documents and approaches have been developed, geared towards HOV lane use. Along with information from the standard roadway design literature (described above), the basis for HOV travel forecasts and designs were developed. The references used for the study are:

- *Guide for Design of High Occupancy Vehicles and Public Transfer Facilities,* AASHTO Task Force for Public Transportation Facilities, 1983
- *Safety Evaluation of Priority Techniques for High-Occupancy Vehicles*, FHWA, February 1979, prepared by N. Craig Miller, M.S., P.E., Principal Investigator, Beiswenger, Hoch and Associates, Inc. (with R. Deuser and Univ. of Florida).
- *Enforcement Requirements for High Occupancy Vehicle Facilities,* FHWA, 1978, prepared by N. Craig Miller, M.S., P.E., Principal Investigator, Beiswenger, Hoch and Associates, Inc. (with R. Deuser and Univ. of Florida).
- *Traffic Control in Carpools and Buses on Priority Lanes on Interstate 95 in Miami,* Transportation Research Center, University of Florida, August 1977
- *A Comparative Analysis of Results from Three Recent Non-Separated Concurrent Flow High Occupancy Freeway Lane Project*: Boston, Santa Monica and Miami, Simkowitz, H.J., US Department of Transportation, June 1978
- *Predicting Travel Volumes for HOV Priority Techniques*, FHWA, 1982

The designs were analyzed for methods of avoiding or minimizing the need of additional right-of-way throughout the project. The termini location criteria were taken from the Department's *Roadway and Traffic Design Standards 2010.*

Both Department and South Florida Water Management District (SFWMD) policies and specifications were complied with for the segment's drainage requirements and stormwater runoff design.

- *Permit Information Manual: Volume IV.* South Florida Water Management District. Latest Edition.
- *Florida Department of Transportation Drainage Manual.* State of Florida: Florida Department of Transportation. Latest Edition.

Since most of the widening is proposed to the outside, we anticipate modification to interchange ramps at Glades Road and Yamato Road. Reconstruction of the Spanish River Boulevard overpass will also be required in order to provide adequate horizontal clearance. Glades Road is proposed to be eight-laned as part of this project and a new interchange "the Airport/FAU" interchange is proposed between Spanish River Boulevard and Yamato Road which will provide direct access into and out of FAU.

4.2 AIRPORT/RUNWAY

The Boca Raton General Aviation Airport is located adjacent to I-95 on the east side between Glades Road and Spanish River Boulevard. Adequate clearances must be maintained for all Federal Aviation Administration (FAA) approach surfaces. These criteria are documented in "*Airport Design Advisory Circular*", U.S. Department of Transportation, FAA document AC: 150/5300-13, dated 9/29/89, plus updates. Geometric elements of interest for this project include all runway horizontal clearance standards and FAA's

required approach and departure surfaces for the Boca Raton Airport. A preliminary geometric evaluation of the proposed bridges nearest to the FAA approach surfaces was conducted, including the proposed new "Airport/FAU" interchange and the new ramp-extension bridge over I-95 on the north side of Glades Road. The proposed "Build" alternative satisfies all pertinent FAA design criteria and required clearances.

4.3 PARK-RIDE FACILITIES

Ancillary HOV facilities, such as park-ride lots, are necessary to promote the full use of HOV lanes in a multi-modal service corridor. Therefore, additional evaluation of park-ride sites identified in earlier studies was conducted during this project. As with the development of design guidelines for roadways and HOV lanes, the standards and criteria used in the *Level II Park-Ride Analysis* represent a combination of the factors considered in the evaluation and design of Miami-Dade and Broward County park-ride facilities and the latest in field experience and research by transportation personnel. Park-ride lots should meet the Institute of Transportation Engineers (ITE) standards set forth in "*Guidelines for Parking Facility Location and Design*", ITE, Technical Committee 5D-8, dated April 1994, plus the City of Boca Raton's planning and zoning standards for parking layout and design, as provided for in the City's land development regulations.

The project study area contains one existing park-ride lot in the northeast corner of the Congress Avenue/NW 82nd Street intersection which is underutilized at present. The "Build" alternative does not include additional park-ride facilities, at this time. Additional study is needed before confirming the need for additional park-ride sites in the study area due to the underutilization of existing park-ride facilities.

CHAPTER 5
Alternative Alignment Analysis

The final alignment of the I-95 widening is dictated by the existing centerline alignment of I-95, along with the existing profile grade. The most cost-effective alignment consists of an alignment that matches, to the maximum extent practical, the existing alignment and grades. Other options, such as executing all of the widening to one side makes no sense, and are not viable options. Therefore, the only viable alignment options are approaches to widening that maintain existing centerline alignment geometries, and conduct the widening equally to the inside, or outside shoulders, while minimizing the amount of reconstruction required. A realignment of the centerline near Yamato Road was considered, but rejected as unnecessary and too costly. Additional documentation of alternatives is available in the Value Engineering (VE) Report that was prepared by VE Group, LLC as part of the PD&E Study.

Alternative alignments for the new "Airport/FAU" interchange were studied, in some detail. Three of the better alignments are shown in Figure 5-1. Alignment "A" was chosen as the preferred alternative for several reasons:

- It provided the most direct connection to I-95
- It requires three parcels of right-of-way, one of which is owned by the State (FAU).
- It did not impact the environmentally-sensitive area (scrub habitat) in the southwest corner of the affected parcel.
- It minimized the amount of land "trapped" in a possible unusable "remainder", to the east of the proposed alignment

This PD&E Study was preceded by the *I-95/I-595 Master Plan Study* prepared by Reynolds, Smith & Hills, Inc. for the Florida Department of Transportation (FDOT). The Master Plan Study evaluated a number of I-95 (SR 9) improvement options and recommended the implementation of the Locally Preferred Alternative (LPA). The LPA suggested that I-95 be widened from eight to12 lanes from Glades Road to Yamato Road and from eight lanes to ten lanes from Yamato Road to south of Linton Boulevard. The Master Plan also suggested a new interchange to serve the Boca Raton Airport and Florida Atlantic University (FAU).

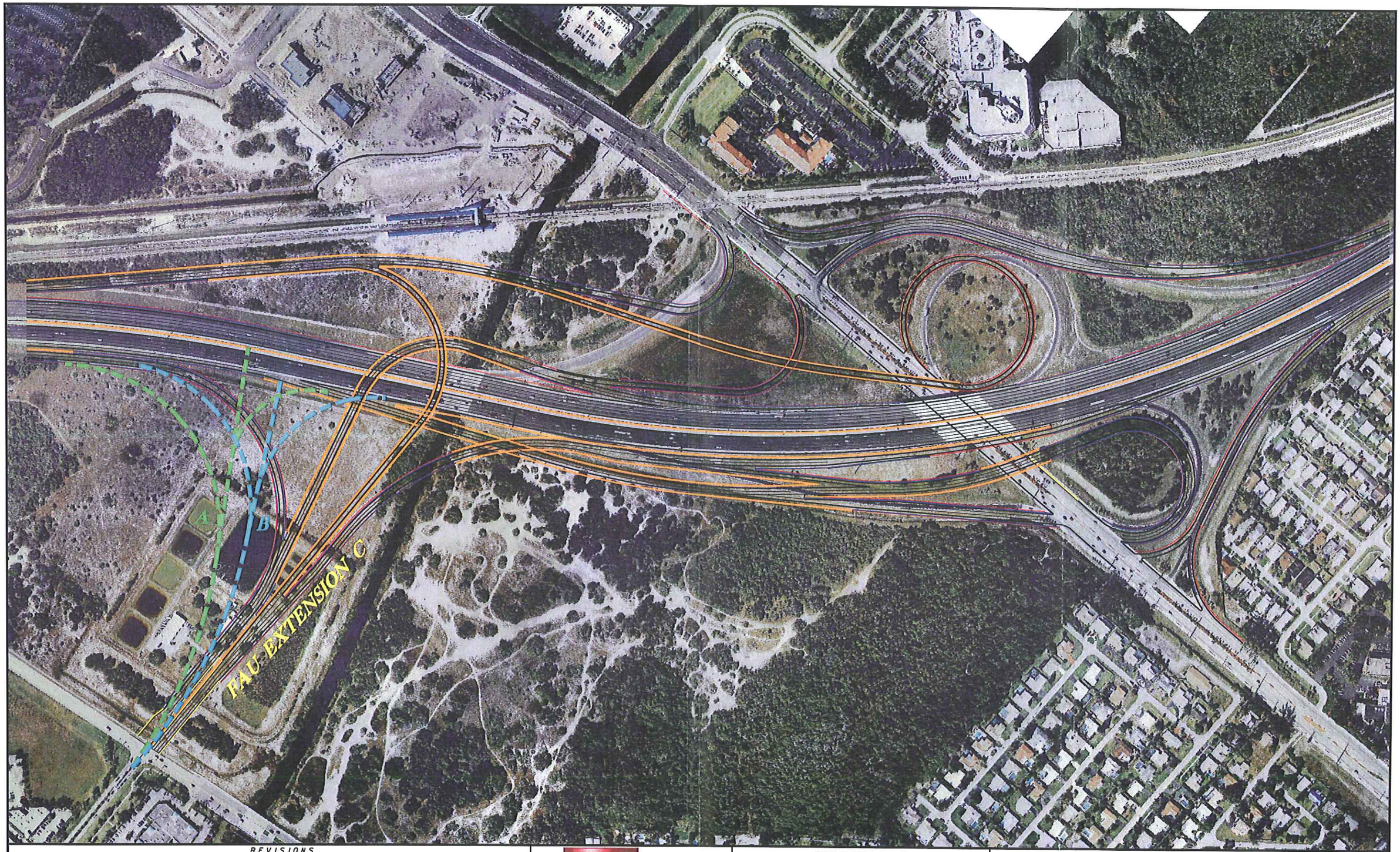
Several approaches for improvement of the corridor as well as analysis of the "No-Build" alternative are discussed in this chapter.

5.1 "No-Build" Alternative

The advantages and disadvantages of the "No-Build" alternative are discussed below.

5.1.1 Mainline

Under the "No-Build" alternative, no modifications or improvements are implemented for the mainline of I-95, Glades Road, or otherwise. Four (4) northbound and four southbound lanes would continue to be available to accommodate future year traffic volumes on I-95 and Glades Road would continue to function as a six-lane highway. The existing High Occupancy Vehicle (HOV) lanes would continue to operate as part of the South Florida HOV system. The limited capacity of the "No-Build" alternative would constrain the available



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Fort Lauderdale, Florida 33308
(954) 653-4700

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

"AIRPORT/FAU" INTERCHANGE ALTERNATIVE ALIGNMENTS

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highway capacity of I-95. With other current projects under design and/or construction, HOV lanes (or express lanes) will eventually be continuous from the I-195/Airport Expressway in Miami-Dade County to Indiantown Road in Palm Beach County. The capacity of I-95 from south of Linton Boulevard to Indiantown Road would be a minimum of ten lanes, being fed/discharged into only eight lanes, south of Linton Boulevard. The "No-Build" alternative would create a feeding-discharge imbalance that would devalue or lessen the benefits of the capacity investments on I-95 north of Linton Boulevard. In other words, the ten-lane capacity available at Linton Boulevard would not be fully utilized or effective due to the eight-lane constraint created by the "No-Build" alternative to the south.

The "No-Build" alternative would retain existing structures, regardless of any deficiency related to vertical clearances. Not all structures meet the Department's minimum vertical clearance standards.

Under the "No-Build" alternative, slight alterations may occur in the future through construction of auxiliary lanes. Auxiliary lanes serve a purpose for safety, and localized operations improvement, but they do not increase the person or vehicle throughput of the overall corridor.

The primary advantages of the "No-Build" alternative are that it does not directly require any capital, or expenditure of state/federal transportation trust funds, and it produces no physical or social impacts.

The disadvantages of the "No-Build" alternative are numerous:

- It produces poorer level-of-service and more traffic congestion.
- It increases air pollution.
- It increases motor vehicle crashes, property damages, and injuries/fatalities.
- It is non-conforming to the MPO's *LRTP*, and local comprehensive plans.
- It increases passenger travel-time and degrades the quality of life.
- No multimodal improvements are provided.
- Emergency vehicle access is degraded.
- Hurricane evacuation clearance time will degrade.
- Increased user costs occur due to congestion.

In summary, there are more disadvantages than advantages.

5.1.2 Interchanges within a "No-Build" Context

Crossroad improvements could be made in the future, under the "No-Build" concept. However, these improvements would serve to improve east-west travel, not the north-south travel, which is the focus of the corridor improvements. Existing horizontal and vertical clearances associated with the I-95 structures could restrict crossroad improvements.

The current interchange configurations at Glades Road and Yamato Road will not accommodate projected Year 2033 traffic volumes at acceptable levels-of-service under the "No-Build" alternative.

5.2 TRANSPORTATION SYSTEM MANAGEMENT

A Transportation System Management (TSM) plan has been developed as an integrated component of the "Build" alternative, and not as a stand-alone, separate alternative. The "Build" alternative for the mainline is one component of a systematic approach to improving the person-carrying capacity deficiencies in the corridor. Other components are equally important for accommodating the region's north-south travel needs. Eight TSM measures support the most efficient use of the I-95 corridor system: 1) HOV lanes, 2) park-ride facilities, 3) rail corridor development, 4) traffic operations improvements to the Glades Road interchange, 5) traffic operations improvements to the Yamato Road interchange 6) an Intelligent Transportation Systems (ITS) package 7) special ramp connections to/from the Yamato Road Tri-Rail station and Florida Atlantic University (FAU) for shuttle buses, and 8) a system of interconnected non-motorized trails, bridges, pedestrian and bicycle facilities. Each of these TSM measures is vital to creating a multimodal system by combining ITS, traffic operations, signalization, park-ride, commuter rail, shuttle bus, non-motorized, crossroad, and HOV lane improvements. These improvements are designed to maximize multimodal efficiency, passenger throughput, modal choices, connectivity, and congestion management in the project study area.

5.2.1 HOV Lanes

The introduction of an HOV lane policy was the first TSM measure considered for use within the project corridor. Mainline capacity and economic analyses conducted for previous studies[1] have shown that use of HOV lanes is warranted within the Palm Beach County I-95 corridor. It is evident that traffic forecasts support the need to continue the operation of the HOV lanes within the project study area. The HOV lanes are critical in developing a mainline I-95 segment, which can accommodate year 2033 person-throughput demands throughout the corridor in an optimum manner.

5.2.2 Park-Ride Facilities

The purpose of park-ride facilities is to support and enhance the use of the HOV and/or commuter rail options in the corridor. The *Park-Ride Justification Study: Palm Beach County*, was prepared for the Department in November 1991 for the I-95 segment from Linton Boulevard to PGA Boulevard. This study indicated that construction of park-ride facilities would boost utilization of the HOV lanes. Although a park-ride justification study has not been developed for the subject segment of I-95, it is anticipated from the previous studies, that park-ride locations would enhance HOV lane usage and that analysis would need to be performed on possible park-ride facilities, before implementation. There is a concern relative to the underutilization of park-ride facilities that must be addressed. Therefore, park-ride lots are not part of the "Build" alternative, at this time.

5.2.3 Rail Corridor Development

Planned South Florida Rail Corridor commuter services are insufficient to preclude the need for additional capacity within the I-95 mainline. The commuter rail system does, however, serve the I–95 market shed in the immediate study area. As with HOV lanes, utilization of the rail corridor's potential and capacity is important for a coordinated systems approach to meet the total capacity demands of the corridor. Double-tracking the South Florida Rail Corridor has been completed in addition to the newly constructed Boca Raton Tri-Rail Station just west of the I-95/Yamato Road interchange.

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[1] JHK & Associates and Reynolds, Smith & Hills, Inc. *Justification Report for I-95 High Occupancy Vehicle (HOV) Lanes and General Purpose Lanes Palm Beach County.* State Proj. no. 93220-1420, WPI Number 4147533, January 21, 1993.

The interstate's HOV lanes, park-ride facilities, ITS elements, and Rail Corridor all serve as a coordinated corridor-wide set of multimodal options available to the commuter. Together, the multimodal assets in the study area represent a coordinated and mutually beneficial system of transportation assets. It is envisioned that the I-95 HOV lanes can be used by express buses or a future Bus Rapid Transit (BRT) system serving the corridor similar to Miami-Dade Transit's (MDT) Express Route 95, which utilizes the I-95 HOV lanes in Miami-Dade County.

5.2.4 Traffic Operations Improvements

The "Build" alternative includes traffic operations improvements at the interchange intersections, as elements of the TSM plan as follows:

- **Glades Road** – The "Build" alternative includes modifying the existing Parclo interchange to a "high capacity" Parclo to improve the performance of the interchange by putting the ramp connections on independent structures. Eight-laning of Glades Road from Butts Road to Florida Atlantic Boulevard and an expanded intersection at the Glades Road/Airport Road intersection will help reduce congestion.

- **Yamato Road Interchange** – Eliminating the weaving condition of the two loops by putting in a stop right and expanding the loop capacity will improve the design, safety, and operation of this interchange. The intersections will also be expanded to reduce congestion as part of the "Build" alternative.

5.2.5 Intelligent Transportation Systems (ITS)

The proposed I-95 ITS infrastructure system must be designed and coordinated with the overall ITS plan for I-95. This task will be handled under a separate contract during the design phase. Existing and future ITS additions include: 1) a single-mode fiber-optic communications cable, including HDPE conduits, splice vaults, pull-boxes, and branch conduits to ITS devices; 2) dynamic message signs with attendant power provisions; 3) closed circuit television (CCTV) cameras, and 4) Microwave Detectors, often co-located with CCTV installations, or on existing sign trusses. Future ITS infrastructure will also include a communications hub to house Ethernet switching equipment, and Service Patrol Automatic Vehicle Locating (AVL) equipment which will include wireless transmitters at all CCTV installations. Currently, an ITS project is under construction for I-95 throughout all of Palm Beach County. The estimated completion date is April 2011.

A multi-part ITS concept plan is recommended for the "Build" alternative and is included in the project's TSM program. This plan includes Closed-Circuit Television (CCTV) freeway surveillance, variable message boards, a route diversion subsystem, a Tri-Rail/modal diversion subsystem, a HOV/park-ride modal diversion subsystem, and a FAU stadium traffic management subsystem.

5.2.6 Special Shuttle Bus Ramps

Special ramp connections were added to the proposed new "Airport/FAU" interchange so that shuttle buses could access FAU directly from the new Tri-rail station near Yamato Road. These ramps are included in the "Build" alternative.

5.2.7 Non-motorized Modes

The "Build" alternative includes a pedestrian bridge over Yamato Road connecting to the El Rio Trail. An

elevated connection to the Tri-Rail station is also provided which establishes an interconnected system of trails, bike paths, and pedestrian paths in the study area. A multipurpose bicycle/pedestrian connection is also provided on Spanish River Boulevard and pedestrian and bicycle paths are provided on Glades Road and Yamato Road.

5.3 "BUILD" ALTERNATIVE

The *I-95/I-595 Master Plan Study* covered the segment of I-95 from Glades Road to the Linton Boulevard, and beyond. The Study reviewed numerous "Build" alternatives for capacity improvements within the Palm Beach County I-95 corridor. The Study covered each of the corridor's main components: mainline, interchange areas, non-interchange crossroads, and the South Florida Rail Corridor. An *"I-95 Interchange Improvements and Railroad Grade Crossing Elimination Study"* was previously developed that included this project segment. The only at-grade railroad crossing in this study corridor is at Yamato Road. All other crossroads pass over the CSX Rail Line. Access to/from the HOV lanes will be provided via general use lanes. No special flyover connections are proposed due to costs and underutilization of other flyovers in more densely traveled locations (i.e. I-95/Broward Boulevard flyovers).

5.3.1 Mainline Treatment

The following section provides information on the recommended laneage for the mainline and ramps for the "Build" alternative. Conceptual Plans are provided in Chapter 6.

Laneage

The "Build" alternative includes added lanes for different sections and links in the study area. The proposed improvements for this project include:

- **Addition of Two General Use Lanes** – This is recommended throughout the corridor from south of Glades Road to south of Linton Boulevard. This involves adding lanes nine and ten to the existing eight-lane cross-section of I-95 throughout the project limits. Proposed I-95 mainline typical sections are provided in Figure 1-3 (a) and Figure 1-3 (b) in Chapter 1.

- **Addition of Two Auxiliary Lanes** – This is recommended from Glades Road to Congress Avenue: adding lanes 11 and 12 to the ten-lane section, described above, for 12 lanes total.

- **Glades Road** – It is recommended that eight lanes be provided on Glades Road from Butts Road to Florida Atlantic Boulevard including bicycle lanes and sidewalks. Glades Road is six lanes at present. A major expanded intersection is also recommended at the Glades Road/Airport Road intersection. Proposed Glades Road typical sections are provided in Figures 1-4 (a) through 1-4 (c) in Chapter 1.

- **Yamato Road** – The proposed I-95 improvements at Yamato Road are recommended to "match" the eight-laned section west of the Tri-Rail through the interchange area.

- **Interchange Ramps** – Selected ramps in the Glades Road and Yamato Road interchanges are proposed to be widened as required to meet forecast traffic volumes.

- **Intersection Laneage** – Intersections within the Glades Road and Yamato Road interchanges are recommended for expansion to provide added capacity.

Usage: HOV vs. General Use Lanes

Traffic and economic analyses support the continued incorporation of an HOV policy in Palm Beach County similar to policies in place along I-95 in Broward County and Miami-Dade County. The two existing HOV lanes will continue to be operated as concurrent-flow lanes with a four-foot buffer as part of the "Build" alternative.

Type of HOV Configuration

The *I-95/I-595 Master Plan Study* recommended continued operation of concurrent flow HOV lanes within the corridor. Concurrent flow HOV lanes place the additional HOV lanes adjacent to, and in the same direction of travel as the adjacent mainline general use lanes. Concurrent flow lanes have been built in both directions for use in the morning and evening peak periods. This design is ideal for areas of relatively balanced directional peaks as experienced in the I-95 corridor in Broward and Palm Beach Counties. HOV restrictions are applied during peak periods. The concurrent flow HOV lanes are located adjacent to general use lanes, having only a striped buffer between the HOV and general lanes for separation. This HOV lane arrangement provides continuous access to and from the adjacent general use lanes. This operation is consistent with I-95 sections to the south and north and will remain in place, as part of the "Build" alternative.

5.3.2 Right-of-Way

Widening will be done to the outside throughout the I-95 project corridor except for the section north of Clint Moore Road where widening will transition to the median. No right-of-way will be needed for mainline improvements on I-95. Acquisition of state-owned (FAU) land for the proposed "Airport/FAU" interchange will be required. However, it is anticipated that this land acquisition will not require eminent domain, which will avoid lengthy delays. Relocation of the FWC Fish Research Facility, located on FAU property will be required due to the new interchange. This property is leased from FAU by the FWC and they are currently on a month to month lease. In addition, a narrow sliver of right-of-way will also be required from two parcels (one owner) in the southeast quadrant of the I-95/Yamato Road interchange. These parcels are east of the El Rio Canal and south of Yamato Road, adjacent to the existing northbound off-ramp at Yamato Road. This will be needed to accommodate "braided" ramps and the northbound-to-westbound loop ramp extension at the Yamato Road interchange. Additional right-of-way is also needed between Butts Road and Renaissance Way along both sides of Glades Road and also near the Airport Road/Glades Road intersection to accommodate widening and an expanded intersection, respectively. This latter property consists of publicly-owned land by the City of Boca Raton as well as narrow piece of land from the Boca Raton High School. Finally, additional right-of-way will be needed along Spanish River Boulevard on both sides in order to accommodate widening to six lanes from Florida Atlantic Boulevard to NW 6th Terrace, a distance of approximately 900'. This right-of-way includes narrow slivers from state-owned (FAU) land, one vacant private parcel, and from the Vistazo at Boca Raton Community.

5.3.3 Interchange Improvements

The following section provides information on the suggested interchange reconfigurations. The interchange reconfigurations suggested under the "Build" alternative are included within the scope of the study and are those which can be accomplished with minimum impacts to adjacent properties and within existing right-of-way except for the new interchange near Spanish River Boulevard. The suggested operational improvements for the project interchanges are discussed and summarized below and in Table 5-1.

Glades Road – Several improvements are recommended at Glades Road. The main improvement is eight-laning Glades Road from Butts Road to Florida Atlantic Boulevard and providing expanded intersections as needed to accommodate design year forecast traffic. Widening the westbound Glades Road Bridge over Military Trail to accommodate the new eight-lane section on Glades Road, plus the auxiliary lanes for the Glades Road loop-ramp extensions are included. Provide separate bridges for the two loop ramp extensions, to avoid widening the Glades Road bridges over I-95. Accommodate the on-ramps from the two loops by removing the slope pavement in the end spans of the Glades Road bridges over I-95.

Yamato Road – The "Build" alternative includes two-lane on/off ramps for all Yamato Road connections to I-95 to/from the south, plus improved interchange geometry and modifications to both loop ramps (ramps to be constructed as independent structures). Braided ramps are included, as needed, to avoid weaving conflicts with the new "Airport/FAU" interchange, to the immediate south. An eight-lane section is recommended on Yamato Road under I-95 to connect to the eight-laned section on Yamato Road west of the Tri-Rail.

New "Airport/FAU" Interchange – A new interchange ("Airport/FAU" interchange), connecting the existing Florida Atlantic Boulevard/Spanish River Boulevard intersection to I-95 is recommended as part of the "Build" alternative. A minimum design speed of 35 mph is recommended for a "Directional T" interchange connection to I-95.

TABLE 5-1
Recommended Operational Improvements to Project Interchange Areas

Interchange	Recommended Improvements
Glades Road	Widen Glades Road bridges over Military Trail to accommodate new lanes and/or independent loop ramp structures. Expand intersections as needed.
Yamato Road	Increase capacity on the existing loops and eliminate weaving condition by reconstructing the loops as independent structures and introducing a stop right. Provide a two-lane southbound on-ramp and two-lane northbound off-ramp. Expand signalized intersections.
New "Airport/FAU" Interchange	Add new interchange connecting Florida Atlantic Boulevard to I-95. Provide a minimum of 35 mph ramps for a "Directional T" type connection to I-95.

5.3.4 Preliminary Drainage and Water Quality

The proposed design for stormwater storage for the project involves storing the roadway runoff in the proposed roadside ditches where feasible, and constructing stormwater storage ponds in infield areas at the interchanges or expanding existing ponds. The right-of-way for I-95 is typically 300' wide and expands at the interchanges. The proposed roadway will feature four general purpose lanes, an HOV lane, auxiliary lanes, and two paved shoulders in each direction. The remaining right-of-way available for drainage and stormwater treatment is limited and is approximately 40' wide on each side (except at the interchange areas).

Since the availability of areas for stormwater storage along the roadway is limited, it will be necessary to use the infield areas at the interchanges for this purpose. Fortunately, the proposed interchange configurations will provide ample opportunity for stormwater ponds. The partial cloverleaf at Glades Road will provide more than enough area for stormwater ponds and other considerations such as aesthetics and environmental considerations that will come into play. Similarly, the proposed changes to the interchange at Yamato Road will provide ample room for ponds. At the Congress Avenue Connector, the opportunities are not as great, and use of retaining walls may be necessary to provide sufficient storage. Retaining walls can be used to

reduce grass slopes and increase the area available for storage of stormwater runoff. The existing ponds along the east side of the project will also have to be expanded and while some right-of-way does exist for this purpose, walls may also have to be considered there too.

Up to the Clint Moore Road overpass (Sta. 325+00.00), the roadway is being widened to the outside. From the Clint Moore Road overpass to the end of project, the roadway is being widened along the inside. Where the roadway is widened along the outside, the existing ditches will be displaced. In many areas, these ditches are part of the existing stormwater collection and treatment system. As such, the new ditches will have to provide the same function for the new roadway, and treatment quantities will have to be calculated for the entire roadway.

In addition, much of the roadway alignment in the project area is curvilinear and the roadway is superelevated. The result is that on the high side of the superelevated sections, the toe of slope naturally lands outside the right-of-way line using standard side slope ratios. This problem can be remedied by constructing retaining walls, which will also allow room for ditch construction, and it is anticipated that this will be required for a significant part of the project. Guardrail can also be used, which allows steeper side slopes and helps to keep the roadway footprint within the existing right-of-way. The exact limits of where guardrail can be used or where retaining walls are needed will be determined during final design.

Stormwater storage requirements will be met by providing storage within the proposed right-of-way. The existing interchange infield areas at Glades Road and the Congress Avenue Connector will provide the storage needed that cannot be met by storing stormwater in the road side ditches. The proposed modifications to the Yamato Road interchange and new connection to Florida Atlantic Boulevard will provide additional land area for storage. The availability of land, plus the fact that the soil is permeable and the water table is deep in most areas, means that there will be no problems meeting stormwater storage requirements.

The major waterbodies found in the immediate vicinity of the project corridor are the C-15 Canal which crosses I-95 between Clint Moore Road and Linton Boulevard, the L-40 Canal which crosses I-95 just north of Clint Moore Road, and the El Rio Canal, located just east of I-95 between Glades Road and Spanish River Boulevard, then crossing over to the west side of I-95 at Yamato Road. In addition, a Lake Worth drainage canal is present along the west side of I-95 adjacent to the T-Rex Trail, and the El Rio (E-4) Canal runs in a north-south direction adjacent to the Patch Reef Trail to the west of the project area. Some other minor drainage canals and wet ditches are also present within the project area.

The project area is underlain by the Biscayne Aquifer, an EPA-designated sole-source aquifer. Coordination with the US Environmental Protection Agency (EPA) has occurred through the Advance Notification (AN) process to determine if the proposed project will have any impact to the Biscayne Aquifer.

A Water Quality Impact Evaluation (WQIE) has been conducted for this project to comply with the Clean Water Act (surface waters) and the Safe Drinking Water Act (groundwater impacts). A WQIE Checklist has been prepared for this study.

5.3.5 Utilities

It is important to keep design and construction of mainline improvements confined to the existing right-of-way wherever possible. This limits the impacts that the project will have on utilities crossing the corridor. Maximum utility involvement will occur at the crossroad locations where proposed bridge modifications/replacements and roadway and ramp widening may impact existing utilities in the interchange areas. If Glades Road is to be widened beyond the existing sidewalk to the south side between Butts Road and Renaissance Way, utility impacts will occur. The conceptual plan layout for the "Build" alternative

suggests most, or all, of the widening in this section will be constructed on the north side, thereby avoiding these utility impacts.

5.3.6 Traffic Control Concepts

Five conceptual Traffic Control Plans (TCP's) (Figures 5-2 through 5-6) have been created, keeping in line with the Manual on Uniform Traffic Control Devices (MUTCD) and FDOT standards. The first and second TCPs address mainline improvements between interchanges for widening to the outside for ten and 12 lanes, respectively. The third plan involves mainline widening to the inside. The fourth TCP addresses construction phasing at the Glades Road interchange. The fifth addresses construction phasing at Yamato Road and the new "Airport/FAU" interchange.

Each of the mainline widening plans utilizes two construction phases. These TCP's are conceptually detailed in Figures 5-2 through 5-6 and summarized in Table 5-2. Figure 5-3 shows a conceptual two-phase construction-sequencing plan for the Glades Road interchange. Where the existing roadways overlap the proposed improvements (i.e. southbound and northbound off-ramps) temporary and/or shoulder pavement will be required, per FDOT standards, to mill/resurface existing pavement. The Yamato Road interchange and "Airport/FAU" interchange, if built together, would require two phases as shown conceptually in Figure 5-4. Standard Index No 616 pg. 2 and/or manual of Uniform Traffic Devices (MUTCD) Figure 6C-1 (Sect. 6C.04) provide some general concepts that can be adapted for work zone traffic management for this general condition.

TABLE 5-2
Maintenance of Traffic for Mainline Between Interchanges/Mainline Overpasses Crossroad

Phase	Elements
1	Four lanes of I-95 traffic will be directed to inside or outside lanes and shoulders. Temporary barrier walls will be erected, as required along the edge of the four temporary lanes. The permanent new lanes and shoulders will be constructed adjacent to temporary barrier.
2	After the outside area improvements are made, work shifts to the inside. When complete, ten lane or 12-lane sections are opened to traffic.

Construction Packaging and Staging

The section of I-95 from south of Linton Boulevard to 12th Avenue South in Lake Worth has already been widened to ten lanes and opened-to-traffic. Therefore, the subject project will tie-in south of Linton Boulevard with a ten-lane typical section that matches the existing ten-lane section. The I-95 project can be logically divided into a maximum of four construction projects. Depending on construction funding availability, the following sequence is suggested:

> **Phasing** - Using up to four contracts, 1) build the "Airport/FAU" interchange 2) build the I-95 improvements from south of Glades Road to Yamato Road; 3) build the Glades Road eight-laning project; and 4) build the I-95 project from Yamato Road to south of Linton Boulevard.

Design and construction for these segments is not currently in the Department's Five-Year Work Program, but is proposed in the 2010 to 2015 timeframe of the MPO's *LRTP*.

NOTE: Typical sections pertain to the northbound roadway. The same concept would also apply to the southbound roadway.

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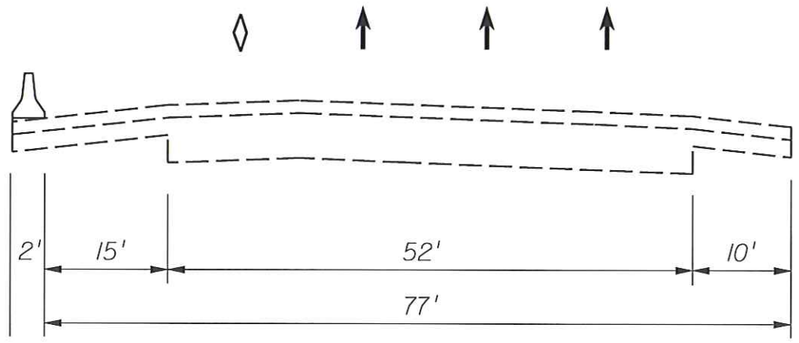

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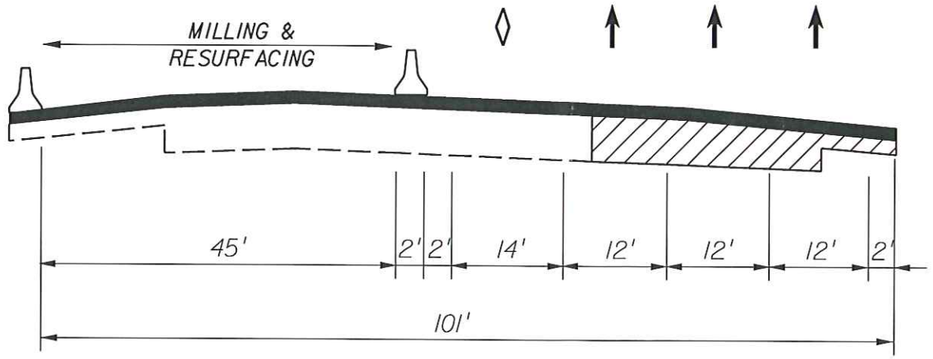
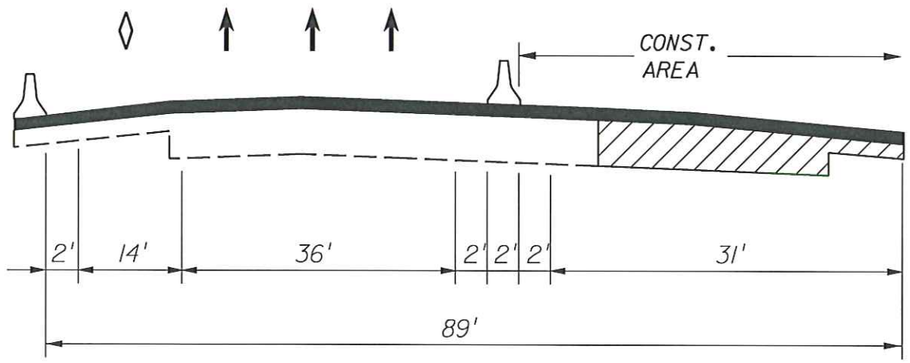
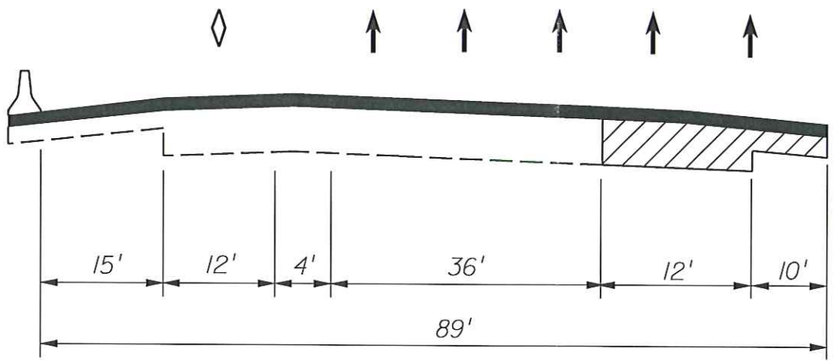


PHASE 2
CONSTRUCTION



PHASE 1
CONSTRUCTION

NORTHBOUND ROADWAY



PROPOSED (PAVED SURFACE)

WIDENING TO THE OUTSIDE -10 LANE ULTIMATE SECTION

NOTE: Interior lanes to be milled and resurfaced using barricades and lane closures.

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

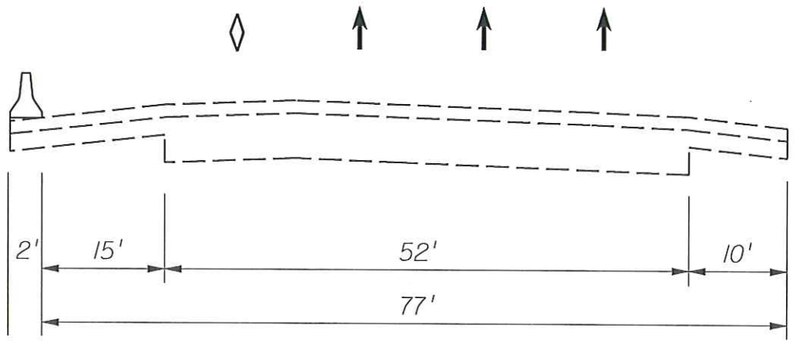
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	

TRAFFIC CONTROL PLAN
TYPICAL SEQUENCE OF CONSTRUCTION
I-95 MAINLINE ROADWAY

FIGURE NO. 5-2

NOTE: Typical sections pertain to the northbound roadway. The same concept would also apply to the southbound roadway.

NOT TO SCALE



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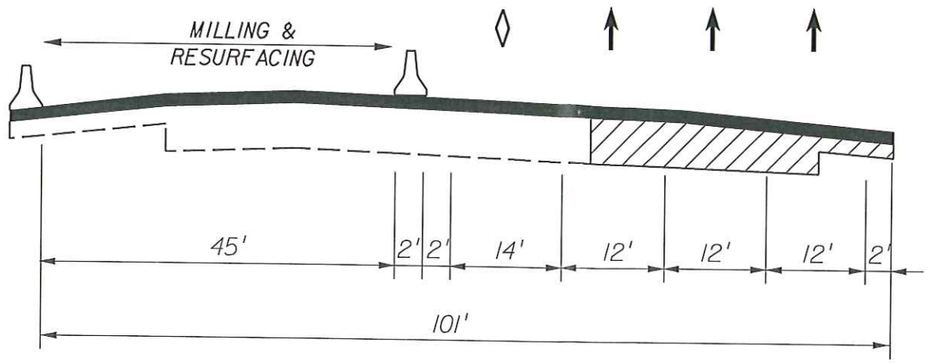
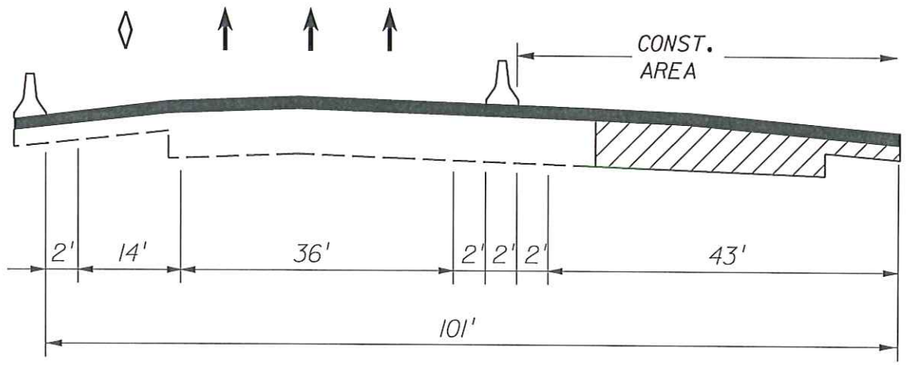
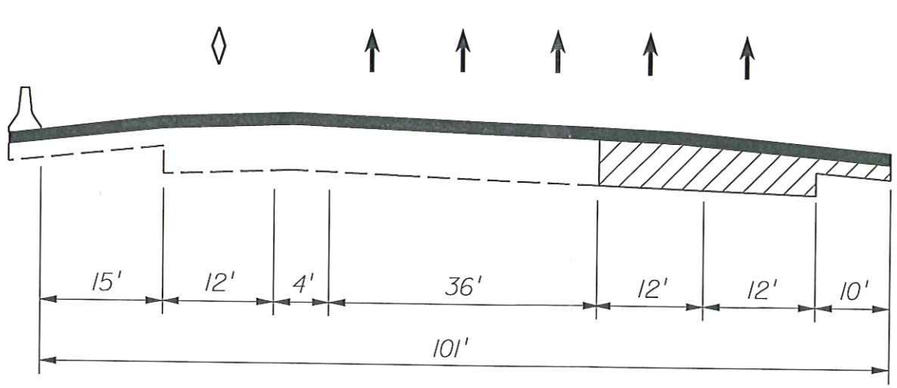


PHASE 2
CONSTRUCTION

NORTHBOUND ROADWAY



PHASE 1
CONSTRUCTION



PROPOSED (PAVED SURFACE)

WIDENING TO THE OUTSIDE - 12 LANE ULTIMATE SECTION

NOTE: Interior lanes to be milled and resurfaced using barricades and lane closures.

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TRAFFIC CONTROL PLAN
TYPICAL SEQUENCE OF CONSTRUCTION
I-95 MAINLINE ROADWAY

FIGURE NO. 5-3

NOTE: Typical sections pertain to the northbound roadway. The same concept would also apply to the southbound roadway.

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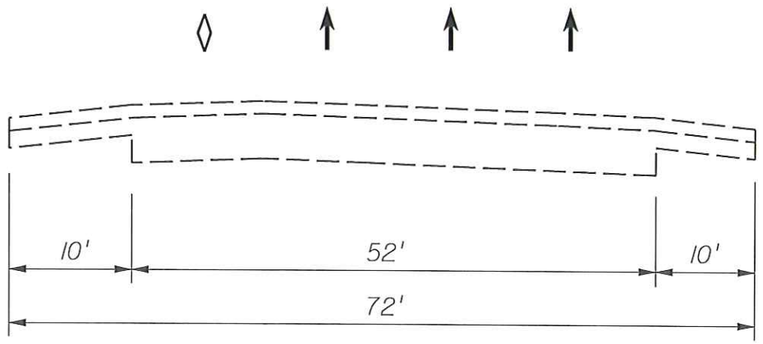
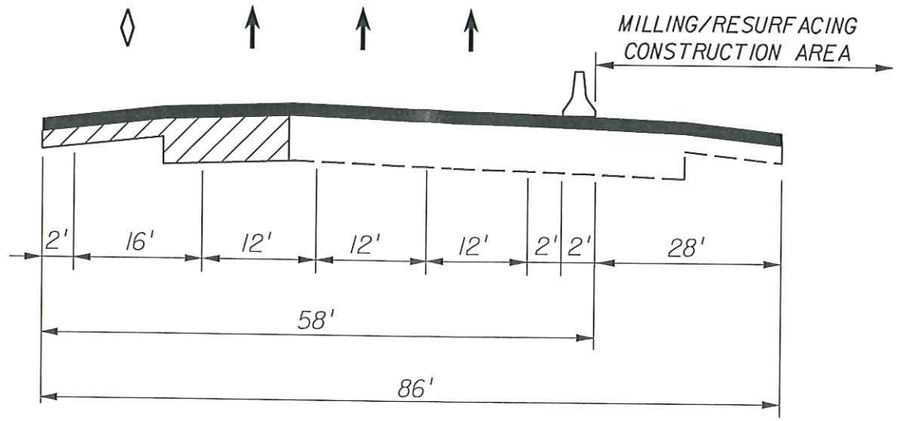
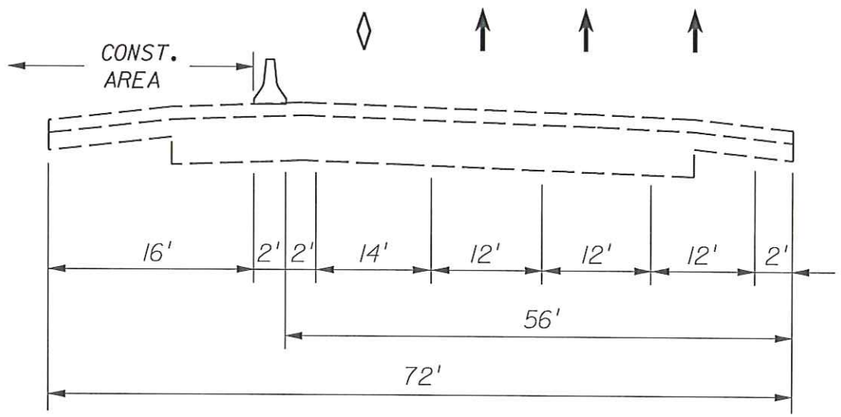


EXISTING (PAVED SURFACE)

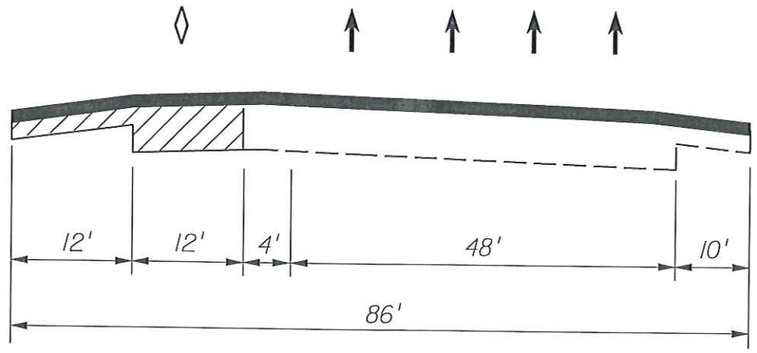


PHASE 2
CONSTRUCTION



PHASE 1
CONSTRUCTION

NORTHBOUND ROADWAY



PROPOSED (PAVED SURFACE)

WIDE MEDIAN
NORTH OF CLINT MOORE ROAD
WIDENING TO THE INSIDE ONLY

NOTE: Interior lanes to be milled and resurfaced using barricades and lane closures.

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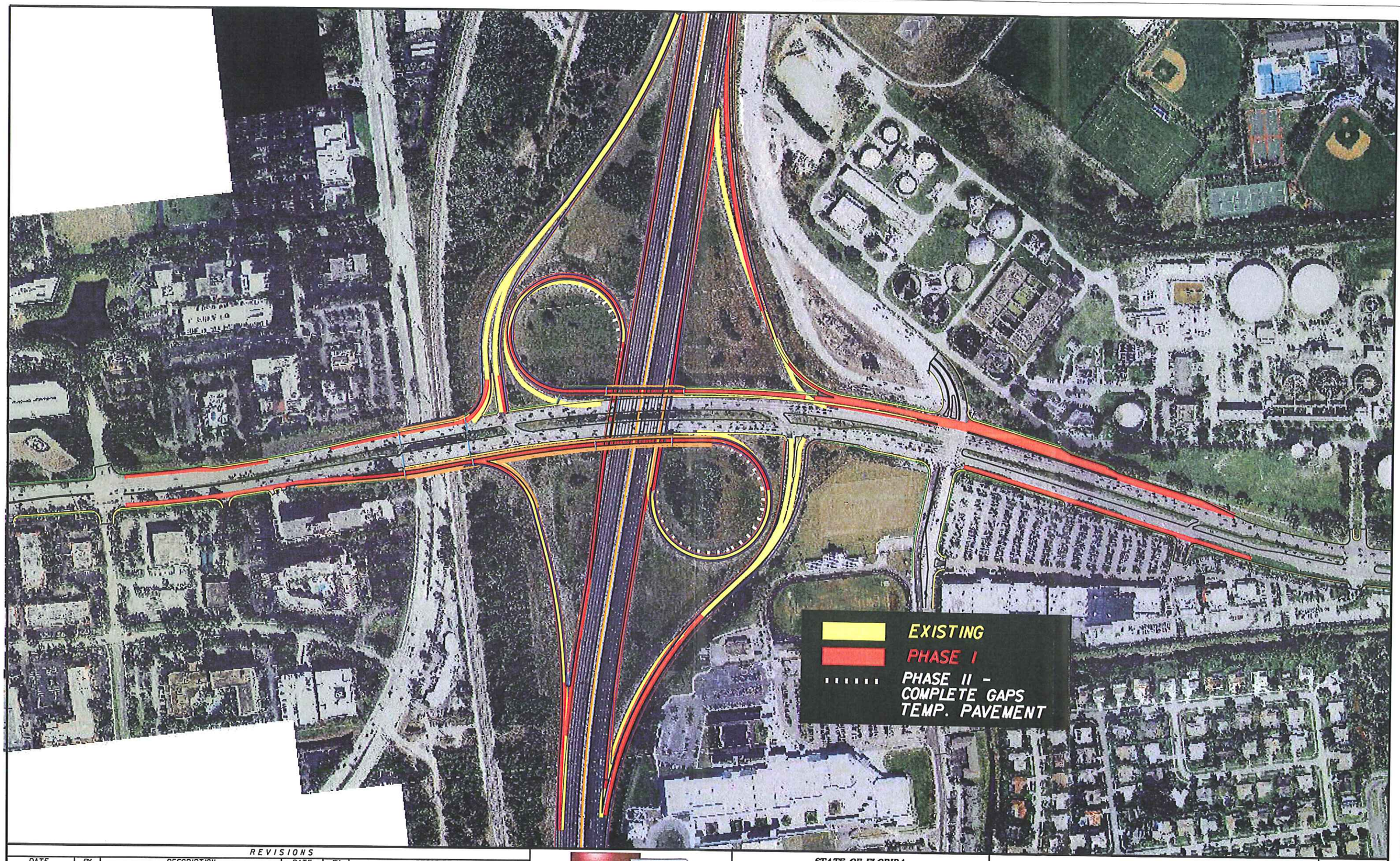
TRAFFIC CONTROL PLAN
TYPICAL SEQUENCE OF CONSTRUCTION
I-95 MAINLINE ROADWAY

FIGURE NO. 5-4



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GLADES ROAD CONSTRUCTION PHASING

FIGURE 5-5

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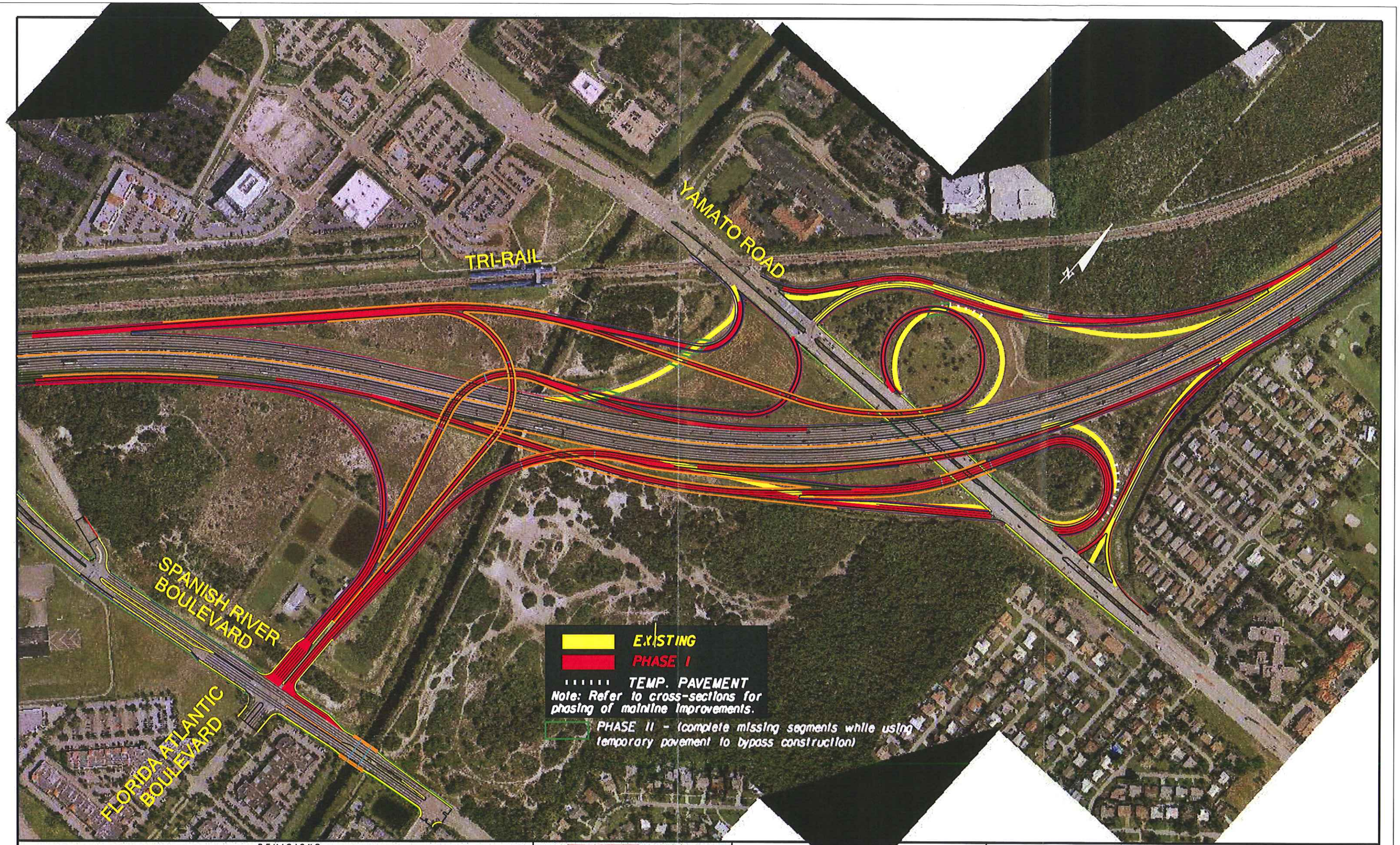

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"AIRPORT/FAU" & YAMATO ROAD CONSTRUCTION PHASING

FIGURE 5-6

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5.3.7 Bicycle and Pedestrian Accommodations

Due to the fact that I-95 is a limited-access freeway, pedestrian and bicycle facilities are prohibited. However, bicycle lanes and sidewalks are proposed on both sides of Glades Road and Yamato Road. An eight-foot wide pedestrian bridge sidewalk is proposed adjacent to the Spanish River Boulevard Bridge over I-95.

The project will not affect any existing pedestrian or bicycle service within the corridor. A bike path planned along the E-4 (El Rio) Canal corridor will not be significantly impacted by this project, which will pass over the proposed bike path with adequate vertical clearance. In addition, a pedestrian overpass of Yamato Road is proposed which will connect to the El Rio Trail and the new Tri-Rail station near Yamato Road.

5.3.8 Access Management

The design of the mainline and related crossroad improvements are in accordance with the access management practices established by the Department's access management approach for I-95's roadway classification and the classification of each cross street.

The access classification for Glades Road is Class 5 and the Access Management Plan (approved and signed on 1/4/07) for the portion of the highway within the project limits is shown in Table 5-3.

Project Number: 412420-1-22-01
Section Number: 93004
State Road Number: 808
Project Limits: Butts Road (MP 4.625) to Florida Atlantic Boulevard (MP 6.583)
County: Palm Beach County
Speed: 45mph
Classification: 5
Date: 9/14/06

TABLE 5-3

Opening	Mile Post	Approx. Sta.	Existing Opening Type	Existing Spacing	Recommended Changes	Proposed Spacing (ft)	Deviation from Standard (%)	Constructed by	
								Project	Others
Butts Road	4.625	244+00.00	Full (Signal)	0	None	0	-		
Directional Median Opening	4.752	251+00.00	WB Directional	700	None	700	0%		
Shoratc Way/Executive Drive	4.859	256+64.00	Full (Signal)	564	None	564	15%		
I-95 Southbound Exit	5.172	273+25.00	SB Off-Ramp (Dir/Sig)	1661	None	1661	0%		
I-95 Northbound Exit	5.381	283+95.00	NB Off-Ramp (Dir/Sig)	1070	None	1070	19%		
NW 15th Ave/Airport Road	5.512	290+80.00	Full (Signal)	685	None	685	48%		
Directional Median Opening	5.696	301+00.00	WB Directional	1,020	None	1,020	0%		
Boca Raton Utility Entrance	5.821	307+60.00	Full	660	None	660	0%		
NW 10th Ave/FAU Entrance	6.070	320+33.00	Full (Signal)	1,273	None	1,273	4%		
FP&L	6.169	325+55.00	Full	522	Close	0	0%		
Entrance to Oaks Medical Complex	6.438	79+20.00	WB Directional	1,420	None	1,942	0%		
NW 13th Street/Florida Atlantic Blvd	6.583	86+50.00	Full (Signal)	730	None	730	0%		

Beth Coe — 1/4/07 Date
Recommended By:
Beth Coe
District Traffic Access Manager

Patrick R Glass — 1/4/07 Date
Concurred By:
Patrick Glass, P.E.
Project Manager

Variances Approved By:
Howard Webb — 1/4/07 Date
Howard Webb, P.E.
District Design Engineer

Tim Brock — 1/4/07 Date
Tim Brock, P.E.
District Maintenance Engineer

Mark Plass — 1/4/07 Date
Mark Plass, P.E.
District Traffic Operations Engineer

REVISIONS		
Date	By	Description

5.4 EVALUATION

The following section introduces the method of evaluation and effectiveness for each of the two alternatives, "No-Build" and "Build".

5.4.1 Alternatives Evaluation

The "paired comparison" analysis method of evaluation was applied to the two alternatives presented: the "No-Build" alternative and the "Build" alternative.

Establishment of Evaluation Criteria

Through analysis, the levels-of-service for the main project elements: mainline, mainline ramp terminals, and crossroad intersections were determined. The Highway Capacity Software (HCS) designed to implement the analysis procedures established by the *Highway Capacity Manual* was used to determine the levels-of-service for the project.

The effectiveness of each alternative was reviewed.

- Does the alternative improve the safety of the mainline and ramp terminal areas over existing conditions?
- Does the alternative provide adequate capacity to support forecasted traffic volumes for the year 2033?
- Does the alternative correct deficiencies, such as substandard geometric features?
- Is the alternative consistent with local long-range transportation plans?
- Does the mainline alternative provide improvements within the existing right-of-way?
- Does the alternative support the social and economic plan for this area?
- Do the interchange concepts provide improvements with minimal right-of-way acquisition, if any (designs requiring minimum or no business and/or residential relocations)?

The evaluation criteria also determined the ability of each alternative to meet minimum engineering design standards.

- Will it be necessary to replace existing structures to accommodate the proposed changes or can they be accommodated by modifications, as needed, to existing facilities?
- Does the design meet minimum allowable horizontal and vertical clearances, provide adequate sight distance, stopping distance, and horizontal geometry for the desired design speed, based on the Department's functional classification, as well as *Local Government Comprehensive Plan* classification of the facility?
- Does the design have moderate-to-significant environmental impact or socioeconomic impacts? Included in these issues are the effect and severity of loss in access to adjacent properties and the acres of additional right-of-way required for each alternative.

Energy consumption is reduced through the reduction in travel-time and congestion.

No significant utility impacts were identified. Utility impacts are anticipated on the south side of Glades Road from Butts Road to Renaissance Way based on the proposed alignment which will require some minor right-of-way taking. However, these utility conflicts can be mitigated if right-of-way is only taken from the north side of Glades Road as opposed to both the north and south sides.

5.4.2 Evaluation Results

"No-Build" Alternative

The existing I-95 mainline provides unacceptable levels-of-service under baseline traffic volumes. The situation worsens significantly when design year 2033 travel demand volumes are assigned to the existing mainline cross-section. All segments function at level-of-service "F" when design year-design hour traffic volumes are applied to existing conditions for the northbound and southbound AM and PM peak hours.

The "No-Build" alternative does not meet the project objectives. Existing substandard design features and motorist safety are not improved. Rather, the increased congestion associated with the "No-Build" alternative will introduce a safety hazard throughout the corridor as future traffic volumes use the existing facilities under degraded conditions. Rear-end collisions and the attendant costs of damages and injuries are well-known by-products of congestion. The "No-Build" alternative is not consistent with, and does not support local long-range transportation plans or social and economic development plans for the area.

The "No-Build" alternative meets minimum horizontal clearance requirements, but does not meet vertical clearance design standards established by the Department in some areas. Loop ramp radii and ramp tapers at the mainline also do not meet current minimum design standards.

The "No-Build" alternative will have an adverse effect on air quality, fuel consumption, and economic growth. No additional right-of-way is required for the "No-Build" alternative and thus will not affect existing patterns of access to adjacent properties. With no right-of-way acquisition or construction requirements, there are no direct costs associated with the "No-Build" alternative. However, general costs will be incurred by the Palm Beach County community through increased gas consumption, increased user costs, increased travel-time, detrimental impact to economic growth in the region, and decreases in air quality coupled with attendant increases in health-related costs. Increased traffic congestion leads to increased delay, which adversely effects air quality and economic costs through higher distribution and delivery costs.

"Build" Alternative

The "Build" alternative consists of two mainline elements: implementation of two general use lanes (one per direction) from south of Glades Road to south of Linton Road plus two auxiliary lanes (one per direction) from Glades Road to Congress Avenue. Interchange elements consist of improvements at Glades Road, Yamato Road, and the new "Airport/FAU" interchange near Spanish River Boulevard.

The "Build" alternative's mainline typical section proposes widening to the outside from Palmetto Park Road to just north of Clint Moore Road, for a total of 12 lanes in this section. North of Clint Moore the widening transitions to the inside median area. Concurrent-flow HOV lanes will continue to operate as presently designed and will also allow corridor users to better access the HOV facilities than they would under a physically-separated HOV lane scenario. The concurrent flow HOV lane scheme is that which has been implemented along other portions of the I-95 corridor in Southeast Florida, consistent with the existing HOV plan for the region. The auxiliary lanes "drop" at the Congress Avenue ramps which provides for a smooth

transition to the ten lane section south of Linton Boulevard. The auxiliary lanes also "drop" for short distances, as they pass through the Glades Road and Yamato Road interchanges.

When compared to the "No-Build" alternative, the "Build" alternative improves levels-of-service throughout all of the mainline and ramp terminals. It meets all project needs, goals and objectives, including the objective of accommodating mainline improvements within the existing right-of-way. The only exception to this is the I-95 mainline level-of-service. The 2033 horizon-year traffic drives mainline LOS to "F" even at 12-lanes of capacity. However, at 12-lanes, I-95 is anticipated to operate at LOS "E" until the year 2019. At this time, a 14-lane section is deemed inappropriate and further system-wide study of other congestion management techniques, including managed lanes is recommended. The acquisition of additional right-of-way for mainline improvements is not necessary, as the proposed mainline roadway typical section and all associated drainage needs can be accommodated within the existing right-of-way. Acquisition of state-owned (FAU) land for the proposed "Airport/FAU" interchange will be required. However, it is anticipated that this land acquisition will not require eminent domain, which will therefore avoid lengthy delays. Relocation of the FWC Fish Research Facility, located on FAU property will be required due to the new interchange. This property is leased from FAU by the FWC and they are currently on a month to month lease. In addition, a narrow sliver of right-of-way will also be required from two parcels in the southeast quadrant of the I-95/Yamato Road interchange. These parcels are east of the El Rio Canal and south of Yamato Road, adjacent to the existing northbound off-ramp at Yamato Road. This will be needed to accommodate "braided" ramps and the loop ramp northbound to westbound at the Yamato Road interchange. Additional right-of-way is also needed between Butts Road and Renaissance Way along both sides of Glades Road to accommodate the eight-laning and near the Airport Road/Glades Road intersection to accommodate widening and an expanded intersection. The properties affected at the Glades Road/Airport Road intersection are from the City of Boca Raton and Boca Raton High School. On the south side at this intersection (NW 15th Avenue), a sliver of right-of-way will be required on the west side which is from the Boca Raton High School. Finally, additional right-of-way will be needed along Spanish River Boulevard on both sides in order to accommodate widening to six lanes from Florida Atlantic Boulevard to NW 6th Terrace, a distance of approximately 900'. This right-of-way includes narrow slivers from state-owned (FAU) land, one vacant private parcel, and from the Vistazo at Boca Raton Community.

5.4.3 Environmental Impacts

Floodplains

According to FEMA Flood Zone Maps (Maps Numbers 125102 0006D, 120195 0006C, 120195 0005C, 120195 0004C, and 120195 0002C) the majority of the I-95 corridor is located outside the 100-year flood plain. The exceptions to this are located east of I-95 just north of Palmetto Park Road, east of I-95 just south of Glades Road, the area east of I-95 by the Boca Raton Airport, the Yamato Road interchange, between Spanish River Boulevard and Yamato Road, an area west of I-95 and the FEC Railroad just south of Yamato Road, and the area just east of I-95 and south of Linton Boulevard. There are no designated floodways in Palm Beach County.

Wetlands/Surface Waters

In accordance with Executive Order 11990, Protection of Wetlands, dated May 23, 1977 and Part 2, Chapter 18 of the PD&E Manual, a wetland evaluation was conducted for the project. The objectives of this study were to identify, map, and evaluate potential wetland impacts that may be associated with the construction of the project, and to assess the function and value of wetlands potentially affected. The Unified Mitigation Assessment Methodology (UMAM) was utilized to assess functional values of each of the potentially affected wetlands. A *Wetland Evaluation Report* has been prepared for this PD&E Study.

Direct wetland impacts to 0.05 acres of W-3a (FLUCFCS 618 - Willow) are anticipated by the project. Additional impacts to swales/wet ditches (FLUCFCS 511) are anticipated due to both the new interchange and the proposed roadway widening and displacement of the stormwater treatment ponds. The UMAM impact raw score for the 0.05 acre assessment area of W-3a was 0.50 based on the fact that this is an isolated, man-made wetland created to treat the water from the fish ponds at the FAU Fish Research Center. The resulting functional loss of this wetland is 0.025 acres. Secondary impacts to the remainder of wetlands W-3a and W-3b are anticipated since the wetland will no longer receive input from the fish ponds due to the construction of the interchange. Impacts to the other wetlands identified by the project have been avoided. Since W-3a is a man-made wetland that is not hydrologically connected to waters of the US, mitigation for impacts to W-3a are not anticipated. Even so, Wetland W-4 will be expanded by 1.39 acres as part of the stormwater treatment improvements. If required, wetland mitigation will occur pursuant to S. 373.4137 F.S. to satisfy all mitigation requirements of Part IV, Chapter 373, FL and 33 USCs 1344.

Wildlife and Habitat

An Endangered Species Biological Assessment (ESBA) has been prepared for this PD&E Study. The results of the ESBA indicate that adverse impacts to protected species are not anticipated as a result of the proposed project. Five federally listed species were evaluated to determine the potential effects of the proposed project on these species. It is unlikely that the West Indian Manatee could travel as far west as the project area along the drainage/flood canals due to the presence of flood control gates. However, the remote possibility exists; therefore, the FDOT will adhere to the USFWS *Standard Manatee Conditions for In-Water Work* during construction. The FDOT has determined that the project may affect, but is unlikely to adversely affect the manatee. Minor impacts to wood stork foraging habitat may occur due to loss of the drainage ditches and swales. However, since replacement foraging habitat in the form of stormwater treatment areas will be created, the FDOT has determined that the project may affect, but is not likely to adversely affect the wood stork. Although a portion of the project is within the snail kite consultation area, no involvement with this species is anticipated. At this time, the Florida scrub jay is not present in the project area, even though the project is within the scrub jay consultation area. The FDOT will coordinate with Environmental Resource Management (ERM) to determine if scrub jays have been re-introduced into the area, especially the Yamato Scrub Natural Area and, if so, coordinate with United States Fish and Wildlife Service (USFWS) accordingly. The eastern indigo snake was directly observed during field surveys in close proximity to, but south of the project limits. Suitable habitat for this species exists within and adjacent to the project area. In order to minimize adverse impacts during construction activities, the *Standard Protection Measures for the Eastern Indigo Snake* will be implemented.

Nine (9) additional state listed animal species were evaluated to determine if the proposed project will affect these species. The scrub areas provide habitat for the gopher tortoise and any potential commensal species, including the gopher frog and Florida mouse. Impacts to gopher tortoise habitat are anticipated. A preconstruction survey will be conducted to determine if these species are present within the construction area of impact and, if present, coordination with the appropriate agency will occur to minimize adverse impacts to the maximum extent practicable. Impact to burrowing owl habitat is also anticipated. Preconstruction surveys will be conducted to determine the status of owls and burrows in the impact areas. Depending on status and time of year, FDOT will coordinate with the appropriate agency(ies) to minimize adverse impacts to the burrowing owl to the maximum extent practicable. Minor impact to habitat for four state listed wading bird species, including the snowy egret, little blue heron, tri-colored heron, and white ibis may occur. Habitat impacts include swales/wet ditches and Wetland W-3a at the Florida Atlantic University (FAU) Fish Research Center, which is reportedly a nesting site for little blue heron and white ibis. A nesting

survey will be conducted by FDOT prior to construction to determine if nesting is occurring at this site. If so, coordination with Florida Fish and Wildlife Conservation Commission (FFWCC) will occur to avoid and minimize adverse impacts. Foraging habitat for wading birds will remain in the project area or be replaced with new stormwater treatment areas.

Construction Impacts

Construction activities for the proposed project will have air, noise, water quality, visual and minor traffic flow impacts for those residents and travelers within the immediate vicinity of the project.

Construction activities will cause minor short-term air quality impacts in the form of dust from earthwork and unpaved roads, and diesel-powered construction equipment. Air pollution associated with the creation of airborne particulates will be effectively controlled through the use of watering or the application of other controlled materials in accordance with FDOT's *Standard Specifications for Road and Bridge Construction* as directed by the FDOT Project Engineer.

Noise and vibrations impacts will be from heavy equipment movement and construction activities such as vibratory compaction of roadway and embankments. Noise generated during construction will be controlled in accordance with the latest edition of the FDOT's *Standard Specifications for Road and Bridge Construction* and through the use of Best Management Practices (BPM). Adherence to local construction noise and/or construction vibration ordinances by the contractor will also be required where applicable.

Water quality impacts resulting from erosion and sedimentation will be controlled in accordance with FDOT's *Standard Specifications for Road and Bridge Construction* and through the use of Best Management Practices.

Construction of the roadway requires excavation of unsuitable material (muck), placement of roadway fill, and use of materials, such as limerock, asphaltic concrete, and portland cement concrete. Demucking will be controlled by Section 120 of the FDOT *Standard Specifications*. Disposal will be on-site in detention areas or off-site. The contractor is responsible for his methods of controlling materials from the project. Temporary erosion control features as specified in the FDOT's *Standard Specifications*, Section 104, will consist of temporary grassing, sodding, mulching, sandbagging, slope drains, sediment basins, sediment checks, artificial coverings, and berms.

5.4.4 Bridge Analysis

Treatments at the location of each structure within the project area will be executed as necessary, in order to accommodate the proposed I-95 improvements. The treatments at these structure locations can be categorized into four general treatments.

- **Widen** - The existing I-95 mainline overpass structures will require widening at Yamato Road (from eight to 12 lanes) and the C-15 Canal (from eight to ten lanes).
- **No Change** – At the Congress Avenue Connector, the horizontal clearances for I-95 under the existing crossroad structures are sufficient to permit the proposed mainline section to be constructed to current design standards without making any structural modifications. This site

carries the crossroad over the mainline.

- **Bridge Replacement** – Due to insufficient horizontal clearances, the Spanish River Boulevard overpass must be reconstructed. The Spanish River Boulevard Bridge is proposed to be reconstructed as a four-lane bridge with a sidewalk on the north side and a multi-purpose two-way pedestrian/bike path on the south side.

- **Span Lengthening** – A creative treatment is recommended at the Clint Moore Road overpass, where there is currently insufficient horizontal clearance to accommodate the widening of I-95. The continuous span steel girder is proposed to be extended and the end-bent treatment modified so that additional northbound widening can be achieved on I-95 without replacing the entire Clint Moore Road Bridge. More detail is provided in the "Conceptual Bridge Report" for this project.

- **New/Independent Bridges** – There are a number of new bridges proposed as part of this project. The independent parallel "ramp-connector" bridges are proposed at Glades Road to provide additional capacity and connect to the two loop ramps in this interchange. Auxiliary lanes on the existing bridges are proposed to be connected to through-lanes as part of the eight-laning of Glades Road. The other new bridges are all associated with the new "Airport/FAU" interchange connecting to the Spanish River Boulevard/Florida Atlantic Boulevard intersection.

Listed below are the existing and proposed bridges, and major structures within the project corridor. The bridge alternatives considered are: remain as is, widen, modify, or fully replace. The proposed improvements identified below are shown in the preliminary plans.

Existing Bridges

B01 Glades Road Overpass (two bridges) – modify east and west end spans to provide for new loop ramps to I-95 at grade. Upgrade bridge rails and include bike lanes within existing six-foot shoulders.

B02 Glades Road over Military Trail / South Florida Rail Corridor (CSX Railroad) – Eastbound Bridge: upgrade bridge rails. Include striped bike lanes within the existing six-foot shoulder. Westbound Bridge: Widen to the north to provide a bike lane, barrier walls, and new covered sidewalk.

B03 Spanish River Boulevard Overpass – full replacement with a new four-lane bridge. The bridge will have a raised median, a covered sidewalk on the north side, and an eight-foot wide sidewalk on the south side. Bike lanes will be included within the outside shoulders.

B10 I-95 over El Rio Canal – Both the northbound and the southbound sides of the I-95 Bridge crossing the El Rio Canal will be widened. The overhangs and barriers on each side will be removed and more deck and beams will be added. Modified beams are needed to reduce the structure depth and maintain the existing eight-foot clearance above the El Rio Trail.

B11 I-95 over Yamato Road - This bridge will be widened to provide 12' outside shoulders in the northbound and southbound directions. This requires one new Type IV beam on both sides, deck widening, and new barrier walls.

B12 Clint Moore Road Overpass – This bridge is anticipated to be salvaged in its entirety by jacking the existing structure, shifting Pier 3 westward, removing Pier 5, and lengthening the spans above I-95 to accommodate the widening. The existing bridge consists of steel plate girders with a concrete deck supported on concrete piers.

B13 Congress Avenue Connector Overpass – No changes are proposed since the structure was built to accommodate the future I-95 widening.

B14 I-95 over C-15 Canal - Widen to the inside for new shoulder; upgrade bridge rails to barrier walls.

B18 Spanish River Boulevard over El Rio Canal – Widen to the outside for a new lane in each direction, new shoulder, and an eight-foot sidewalk on the south side.

New Bridges

B01B Ramp connection eastbound Glades Road to northbound I-95. This is an independent bridge over I-95 on the south side of the eastbound Glades Road Bridge.

B01A Ramp connection westbound Glades Road to southbound I-95. This is an independent bridge over I-95 on the north side of the westbound Glades Road Bridge.

B02A Ramp connection for eastbound Glades Road to northbound I-95. This is an independent bridge over I-95 on the south side of the eastbound Glades Road Bridge over the over Military Trail and the South Florida Rail Corridor (SFRC) / CSX Railroad.

B04 Southbound I-95 to southbound FAU Extension Off-ramp over I-95. This bridge has two spans crossing the northbound and southbound sections of I-95. The bridge is a curved-steel girder structure with two lanes, shoulders, and barrier walls.

B05 Northbound FAU Extension to southbound I-95 over I-95 and Bridge B04. This bridge has two spans crossing the northbound and southbound sections of I-95. The east span also crosses over the northbound I-95 Exit Ramp to Yamato Road. The west span also crosses over the southbound I-95 to FAU extension ramp near the west abutment. The bridge is a curved-steel girder structure with two lanes, shoulders, and barrier walls

B06 Southbound I-95 On-ramp from westbound Yamato Road over the El Rio Canal. This bridge has three spans crossing the El Rio Canal and the east span also crosses over the El Rio Trail. The bridge has Type II AASHTO beams with two lanes, shoulders, and barrier walls.

B07 Southbound I-95 to southbound FAU Extension Off-ramp over the El Rio Canal. This bridge is a single span of 120 feet crossing the El Rio Canal and the east span also crosses over the El Rio Trail. The bridge has Type V AASHTO beams with two lanes, shoulders, and barrier walls. The vertical profile of the bridge is well above the Canal since the ramp grade is going up to cross I-95. Therefore, a single span is used, instead of a three-span configuration similar to Bridge 06, to eliminate tall piers which would be unsightly.

B08 Northbound FAU Extension On-ramp to northbound I-95 over the El Rio Canal and NB I-95 Off-ramp to eastbound and westbound Yamato Road. The south span crosses over the El Rio Canal, the center span crosses over the El Rio Trail, and the north span cross over the I-95 northbound ramp to Yamato Road. The three alternatives for this bridge are three-span curved steel girder structures.

Alternative 1 has a standard pier cap at Pier 3 which requires the entire pier to be clear of the northbound ramp.

Alternative 2 has an integral pier cap at Pier 3, which allows the pier to overhang the northbound ramp. This alternative allows for a lower roadway profile due to the reduced structure depth.

Alternative 3 introduces a fourth pier, which is a straddle bent between Pier 3 and the north end bent. Making this bridge a four-span configuration reduces the span lengths to a maximum of 160' for the two center spans.

B09 Northbound I-95 Off-ramp to eastbound and westbound Yamato Road over the El Rio Canal. This bridge has three 40' spans crossing the El Rio Canal and the east span also crosses over

the El Rio Trail. The bridge has Type II beams with two lanes, shoulders, and barrier walls. The bridge profile must clear the El Rio Trail by eight-feet minimum, which will control the ramp vertical profile.

B11A Northbound FAU Extension On-ramp to northbound I-95 over Yamato Road. This bridge has two spans crossing Yamato Road with a single pier in the median. The bridge has BT 78 beams supporting one lane, shoulders, and barrier walls.

B15 Westbound Yamato Road to southbound I-95 over Yamato Road. This bridge has two spans crossing Yamato Road with a single pier in the median. The bridge has BT 78 beams supporting one lane, shoulders, and barrier walls.

B16 Westbound Yamato Road to southbound I-95 over westbound ramp from Yamato Road onto southbound I-95. This bridge is a single span crossing over a new single-lane at-grade ramp. The bridge has Type III beams supporting one lane, shoulders, and barrier walls.

B17 Northbound I-95 and westbound FAU ramp to westbound Yamato Road loop ramp over Yamato Road. This bridge has two spans crossing Yamato Road with a single pier in the median. The bridge has Type IV beams supporting three lanes, shoulders, and barrier walls.

Other Structures

L-46 Canal - canal crossing/overpass (single box culvert)
L-40 Canal - canal crossing/overpass (twin 9' X 7' box culvert)

Prestressed concrete beams and cast-in-place concrete deck slabs were the primary choices for bridge types for their durability, standardized construction, economy and consistency with the other bridges in the vicinity. The span lengths vary from less than 100' for existing bridge widening to over 230' for new bridge construction or replacing existing bridges. On existing bridges, the same beam sizes as existing are proposed for bridge widenings.

Steel plate girder superstructure is proposed only on curved bridges. Three bridges, B04, B05, and B08 are proposed as steel plate girder superstructures. Other possible bridge types, such as segmental, were considered; however, the comparatively smaller overall bridge length limits the economy-of-scale needed for this alternative to be economically viable. Moreover, with steel girder bridges, utilizing closer girder spacing, the superstructure depth could be reduced to maintain tolerable vertical profiles. This flexibility affords opportunities to explore different combinations of girder depths with respect to economy due to fewer retaining structures, shorter piers, etc. in final design.

Pedestrian Bridge for El Rio Trail

Refer to Figure 3-1 for references to nodes. The existing El Rio Trail runs from Yamato Road (Node 5) along the east side of the tracks then turns east towards Florida Atlantic University. There is a trail spur from the Tri-Rail Station (Node 1) northeasterly over the El Rio Canal [(Node 2) to (Node 3)]. This study evaluates the option of providing a pedestrian bridge to span over the railroad and continue over Yamato Road before touching down on the north side of Yamato Road. The specific segments of this bridge are as follows:

3-4 This segment is a switchback ramp that meets Americans With Disabilities Act (ADA) requirements to raise the trail above the railroad tracks. Stairs are optional at Node 4.

4-9 This segment is a bridge over the railroad providing 23'-6" of vertical clearance above the tracks.

9-6 This segment is a pedestrian bridge that drops approximately five feet from the span over the railroad to the span over Yamato Road.

6-8 This segment is a single span crossing Yamato Road with a vertical clearance of 17'-6" above the roadway.

7-6 This segment is a bridge over the Canal connecting back to the Tri-Rail Station. A switchback and stairs could be provided at Node 7 or Node 6. This can be determined in final design.

8 This would be a switchback and stairs to get back to the sidewalk level at the roadway.

Elevators are not anticipated for vertical circulation since the switchback ramps provide ADA accessibility. Stairs may be an option at Nodes 4, 6 and 8, which can be determined in the final design. The bridge will most likely be a steel frame structure to accommodate the span lengths and to closely replicate the Tri-Rail station bridge in terms of architecture. The structure style would be determined in final design.

The "Build" alternative will meet all minimum standards established by the Department for all vertical clearances except for Yamato Road's 15'-3" existing vertical clearance. This study recommends depressing Yamato Road to correct this deficiency. The widening of I-95 under Glades Road will also require a small vertical clearance variance, where the vertical clearance will drop to about 16'-4 5/8" for the easternmost northbound lane, only. The Value Engineering Team recommended saving the Clint Moore Road Bridge over I-95 by extending the continuous steel girder and moving the eastern end bent back to the east to allow for the widening of I-95 under the bridge. This will require a variance for a 15'-9 5/8" vertical clearance for the easternmost northbound lane on I-95. The "Build" option also requires widening the overpass bridges at the El Rio (E-4) Canal and the C-15 Canal crossings.

In order to meet the necessary horizontal clearances, the "Build" alternative also requires the demolition and reconstruction of one bridge over I-95: Spanish River Boulevard. Two sag curves on I-95 meet the Department's minimum standard "K" value of 206'. One crest curve (over Yamato Road) has a substandard curve length of (1,000'). The minimum allowable is 1,800'. A design variation is recommended to keep it as is to avoid reconstruction of the I-95 mainline over Yamato Road.

A variance for keeping the profile grade line at its existing point will be required in order to avoid reconstruction. A variance will also be required for horizontal clearance as follows:

- The Glades Road interchange loop ramp for the eastbound to northbound loop is proposed to pass through the end span of the Glades Road Bridge over I-95. This will require a shoulder width variance for the underpass area of the inside shoulder, only.

- The desirable HOV lane shoulder width, for Florida Highway Patrol (FHP) enforcement purposes is 15'. A shoulder width variance may be required for the underpass areas at the Clint Moore Road and Congress Avenue overpasses where bridge piers are located in the median area. In no case do the variances require less than the ten-foot desirable shoulder width for general lanes. The length of the variance is generally less than 150' per occurrence.

- It is impossible to maintain the 45 mph design speed on Glades Road at the Airport Road intersection due to the cross slope on the existing Glades Road bridges at this location. If the bridges are not jacked to correct them to the required superelevation, a design speed variance down to 35 mph will be required.

5.4.5 Noise Barriers

A noise study has been conducted for the project. The *Noise Study Report* (NSR) is on file at FDOT, District Four. The noise study evaluated the reasonable need for noise barriers along the project corridor.

Table 5-4 lists the existing and proposed noise barriers, and identifies the benefitted communities for each.

TABLE 5-4
EXISTING AND PROPOSED NOISE BARRIERS

Scenario	No Barrier		14' Barrier		18' Barrier		22' Barrier	
Year	2033 Build		2033 Build		2033 Build		2033 Build	
	Min Leq	Max Leq	Min Leq	Max Leq	Max Leq	Max Leq	Min Leq	Max Leq
Barrier 1								
Fairfield Gardens	69.4	76.8	Not modeled (height maximized – train noise)				60.2	68.9
Barrier 2A								
Country Club Village	66.7	74.6	65.5	69.1	Not modeled (14' max height for shoulder)			
Barrier 2 (existing)								
Country Club Village	n/a	n/a	65.8*	69.7*	++	++	++	++
Barrier 3 (existing)								
Country Club Village	n/a	n/a	64.9*	69.3*	++	++	++	++
Barrier 4 (existing)								
San De Vance	n/a	n/a	n/a	n/a	59.7*	69.9*	n/a	n/a
Barrier 5								
Boca Teeca Condos	69.7	79.1	n/a	n/a	n/a	n/a	64.0	71.1
Barrier 6								
Hidden Lakes & Hidden Valley	64.6	67.6	n/a	n/a	56.2	60.4	n/a	n/a
Barrier 7 (Existing)								
Hidden Valley	n/a	n/a	54.6**	59.0**	n/a	n/a	n/a	n/a
Barrier 7 (Ext.)								
Hidden Valley	59.2	60.2	56.7**	57.6**	n/a	n/a	n/a	n/a
Tropic Palms	59.9	61.3	56.3**	57.4**	n/a	n/a	n/a	n/a
Barrier 8								
Tropic Palms	61.4	66.0	n/a	n/a	54.0	58.0	n/a	n/a
Bahia at Delray Beach Condos	58.9	68.9	n/a	n/a	54.4	60.8	n/a	n/a
Terra Verde Condos	62.9	69.5	n/a	n/a	57.2	61.5	n/a	n/a

*These decibels are measured for the existing barrier height.
++Not computed, 5 dBA or greater noise reduction achieved with existing height barriers.
**Actual height is 8 feet, not 14 feet as listed in the header.

Below is a description of the existing and proposed noise barriers.

Barrier 1 is proposed to consist of a new noise barrier constructed between the railroad right-of-way and the Fairfield Gardens development. The recommended dimensions are proposed to be 22 feet in height and 1,065 feet in length. This barrier is being recommended to help mitigate noise generated by passing trains in addition to I-95 traffic noise.

Barriers 2 & 3 need no changes in length or height, as the TNM analysis determined that the existing barriers are adequate.

Barrier 2A is proposed to be 14 feet in height and 215 feet in length, and is recommended to be positioned between Barriers 2 and 3. This 14-foot gap shoulder barrier is recommended for further consideration through cost averaging over the entire project based on the reduction of the very high 74.6 dB level at receiver 12, and also due to past public input regarding the high noise levels coming through the gap between Barriers 2 and 3 at this location. Receivers 42, 43, 60 and 61 are impacted and also get a perceptible reduction in noise from the gap shoulder barrier (although not the desired 5 dB, and therefore not included in the cost calculations).

Barrier 4 needs no changes in length or height.

Proposed Barrier 5 is proposed to be a new 22-foot tall noise barrier 540 feet in length. The proposed barrier would be constructed along the east edge of the I-95 right-of-way.

Barrier 6 is proposed to be a new 18-foot tall noise barrier approximately 2,800 feet in length. The proposed barrier is recommended to be constructed along the east edge of the I-95 right-of-way from the drainage control ditch to the beginning of the Congress Avenue ramps.

Existing Barrier 7 is eight feet tall and located along the ramps at the Congress Avenue interchange. The TNM determined that the height is adequate. Extension of the eight-foot tall barrier across the C-15 Canal Bridge, a distance of 250 feet, is recommended.

Proposed Barrier 8 is to consist of a new 18-foot tall barrier approximately 3,900 feet in length located along the east edge of the I-95 right-of-way beginning at the C-15 Canal and extending northward toward Linton Boulevard.

Construction of noise barriers would be considered reasonable and feasible to mitigate for traffic noise impacts at numerous residential developments. The total cost to construct all noise barriers recommended in this study is $4,827,300. The TNM analysis indicates that 254 noise receiver sites would receive a 5 dBA or greater noise reduction resulting from construction of the six noise barriers. Therefore, the average cost per benefitted receiver would be approximately $19,005, which is below the $42,000 threshold. For that reason, the six noise barriers proposed for this project (five walls, one extension) are considered feasible and reasonable.

The "Build" alternative's typical section will have favorable impacts in several areas. This option improves air quality by producing a marked reduction in vehicle delay and it will improve vehicle safety within the corridor by decreasing rear-end crashes caused by stop-and-go traffic conditions. It would provide support for the economic growth patterns identified in the *Local Government Comprehensive Plans ("Comp Plans")*. The proposed improvements along the I-95 mainline and the new interchange are consistent with the 2035 Long Range Transportation Plan – Needs and Cost Feasible Plan of the Palm Beach County Metropolitan Planning Organization (MPO), approved by the MPO Board on October 15, 2009. The proposed improvements are also contained in the Fiscal Year 11-15 Transportation Improvement Program (TIP) for the area, approved on September 17, 2009, which includes the new interchange between Glades Road and Yamato Road, connecting I-95 with Spanish River Boulevard. The project is also listed in the FDOT SIS/FIHS Long Range Highway Capacity Plan for fiscal years 2021-2025.

The preliminary probable cost for implementing these improvements is 213 million dollars. This includes 38 million dollars for engineering activities, 165 million dollars for construction, and $10 million for right-of-way acquisition.

Table 5-5 presents the evaluation matrix for the "No-Build" and "Build" alternatives.

TABLE 5-5
ALTERNATIVES EVALUATION MATRIX

Goals	Evaluation Criteria	Alternatives	
		"No-Build" Alternative	"Build" Alternative
Improve Level-of- Service	Mainline - # segments worse than LOS "E"/total	5 of 5	4 of 5
	Ramp Terminals - # worse than LOS "E"/total	20 of 20	12 of 20
Meets Project Objectives	Provides additional capacity?	No	Yes
	Corrects substandard elements?	No	Yes
	Improves Safety?	No	Yes
	Consistent with transportation plans?	No	Yes
	Supports local economic plans?	No	Yes
	Requires new right-of-way?	No	Yes
Meets Engineering Criteria	Meets minimum horizontal and vertical clearance?	No	No
	Replace/modify existing major structures?	No	Yes
Minimize Impacts	Air quality impacts?	No	No
	Noise impacts?	Yes, Not Mitigated*	Yes, Mitigated
	Potential contaminated sites impacted?	No	12 Medium, 5 High Risk
	Business/residential relocations required?	No	No
	Impact to wetlands/surface waters?	No	0.05 ac/8.27 ac
	Effects access to adjacent properties?	No	No
	Adverse effects to threatened & endangered species?	No	No
Keep Costs Reasonable	Engineering costs? (millions)	$0	$38 M
	Construction costs? (millions)	$0	$165 M
	Right-of-way acquisition costs?	$0	$10 M
	Total Capital costs (millions)	$0	$213 M

** Some of the noise impacts are mitigated.*

5.5 PREFERRED ALTERNATIVE

Of the two proposed alternatives, the "Build" alternative is preferred. The "Build" alternative combines the auxiliary lane improvements and general use lane improvements for the mainline with improvements to interchange areas and other needed, concurrent improvements. The following is a summary of the preferred alternative elements.

Mainline

The proposed alternative is comprised of two additional general use lanes (one in each direction) throughout the project limits. All new lanes are proposed to be constructed to the outside from south of Glades Road to just north of Clint Moore Road. From north of Clint Moore Road to south of Linton Boulevard the widening transitions from the outside to the inside.

Auxiliary Lanes

This project provides for one northbound auxiliary lane and one southbound auxiliary lane between Glades Road and Congress Avenue. Together with the general use lanes, this will create a 12 lane section, total.

HOV Lanes

Two concurrent flow HOV lanes, one in each direction, are proposed to continue to operate throughout the project limits.

Glades Road Widening

The "Build" alternative includes the widening of Glades Road, from Butts Road to Florida Atlantic Boulevard, from six lanes to eight lanes, plus necessary intersection improvements such as an expanded intersection at Glades Road/Airport Road.

Interchanges

The proposed interchange configurations incorporated into the "Build" alternative provide additional interchange capacity. Table 5-1 summarizes the operational improvements to be made at each interchange location for the interchanges that have need for improvement. A new interchange is provided to serve the Boca Raton Airport and FAU, just south of Yamato Road.

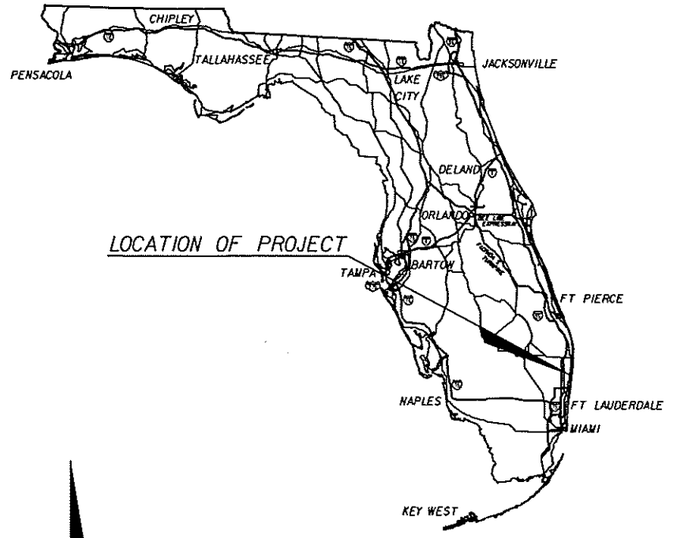
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

CONCEPTUAL PLANS

FINANCIAL PROJECT ID 412420-1-22-01

PALM BEACH COUNTY (93220)

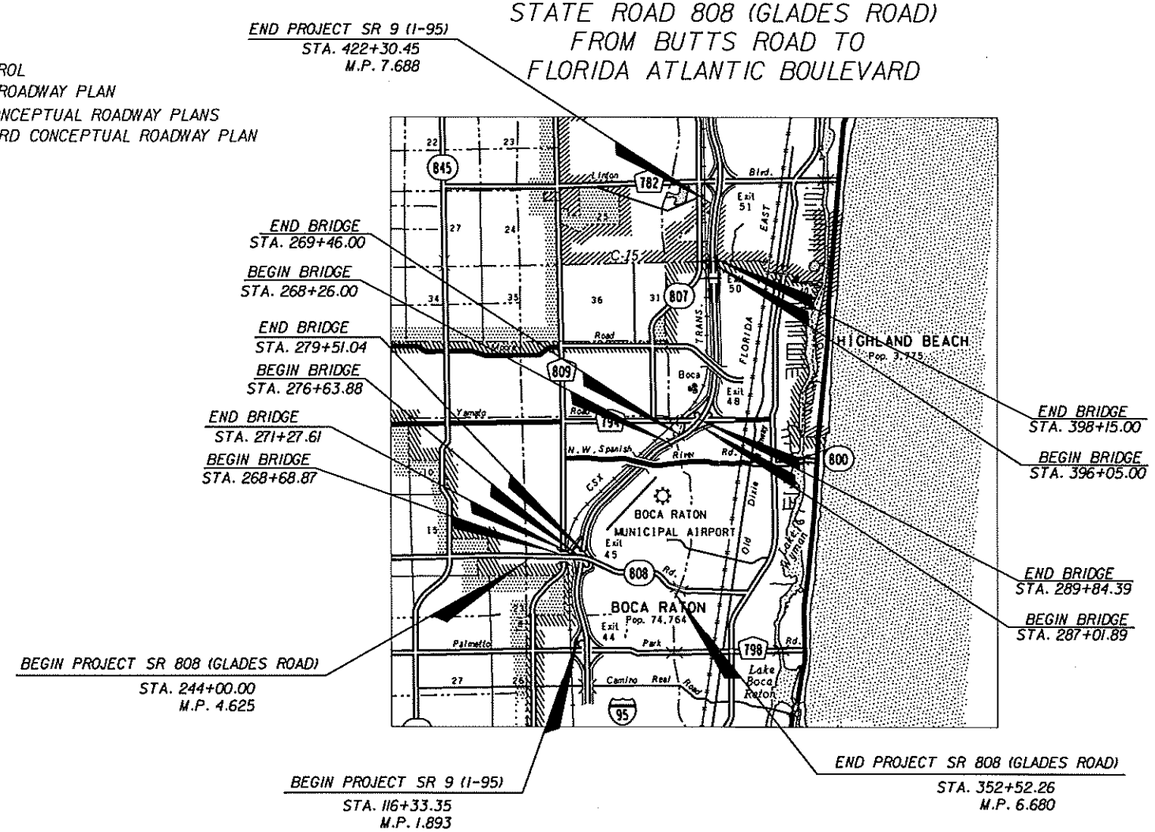
STATE ROAD NO. 9 (I-95)
FROM SOUTH OF GLADES ROAD
TO SOUTH OF LINTON BOULEVARD
AND
STATE ROAD 808 (GLADES ROAD)
FROM BUTTS ROAD TO
FLORIDA ATLANTIC BOULEVARD



N

0 1 2
Miles

INDEX OF CONCEPTUAL ROADWAY PLANS



GOVERNING STANDARDS AND SPECIFICATIONS:
FLORIDA DEPARTMENT OF TRANSPORTATION,
DESIGN STANDARDS DATED JANUARY 2010,
AND STANDARD SPECIFICATIONS FOR ROAD AND
BRIDGE CONSTRUCTION DATED 2004,
AS AMENDED BY CONTRACT DOCUMENTS.

PLANS PREPARED BY:

TranSystems Corporation
2400 East Commercial Boulevard
Fort Lauderdale, Florida 33308
(954) 979-4799
N. Craig Miller, P.E. 13147

NOTE: THE SCALE OF THESE PLANS MAY
HAVE CHANGED DUE TO REPRODUCTION.

PROJECT LENGTH IS BASED ON ℄ OF SURVEY

LENGTH OF PROJECT	LINEAR FEET	MILES
ROADWAY	40,290.96	7.63
BRIDGES	1158.40	0.22
NET LENGTH OF PROJECT	41,449.36	7.85
EXCEPTIONS	0.00	0.00
GROSS LENGTH OF PROJECT	41,449.36	7.85

FDOT PROJECT MANAGER: PATRICK GLASS, P.E.

REVISIONS

KEY SHEET REVISIONS		
DATE	BY	DESCRIPTION

ROADWAY PLANS
ENGINEER OF RECORD: N. Craig Miller P.E.

P.E. NO.: 13147

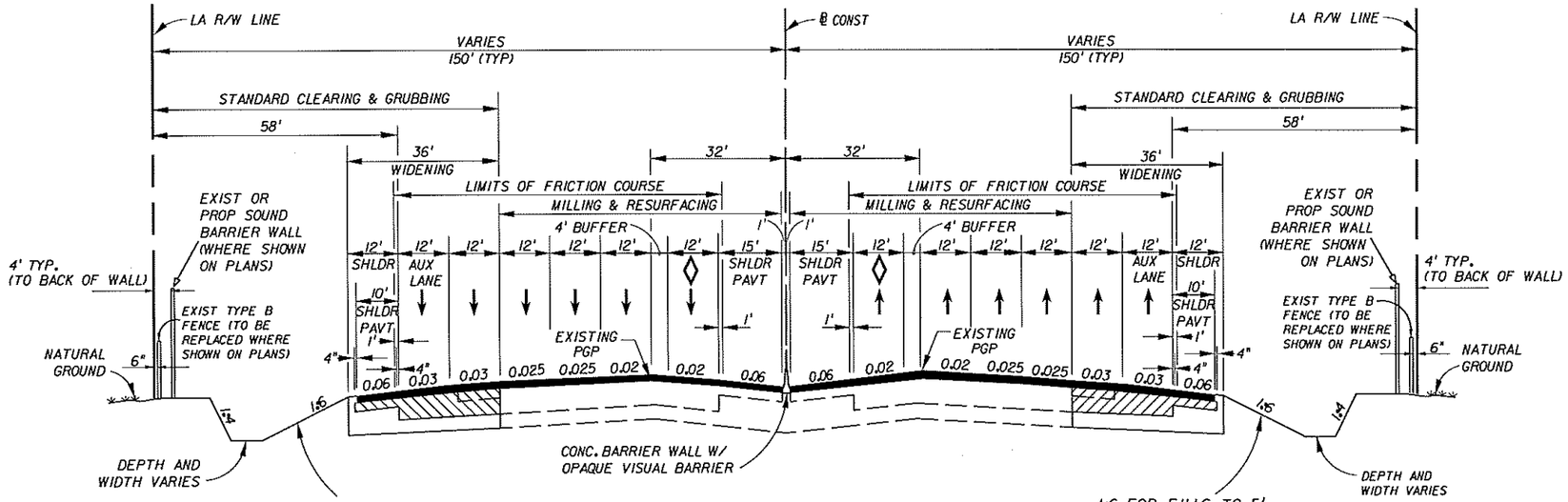
FISCAL YEAR	SHEET NO.
	1

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID	412420-1-22-01	FEDERAL AID PROJECT NO.	0951-605-I	COUNTY NAME	PALM BEACH
SECTION NUMBER	93220	ROAD DESIGNATION	SR 9 (I-95)	LIMITS/MILEPOST	MP 1.893 TO MP 7.688

PROJECT DESCRIPTION: Widening and Resurfacing of SR 9 (I-95) from south of Glades Road to south of Linton Boulevard, & widening/resurfacing of Glades Road (SR 808) from Butts Road to Florida Atlantic Boulevard.

PROPOSED ROADWAY TYPICAL SECTION
TEN LANE SECTION WITH TWO AUXILIARY LANES



SR 9 (I-95)

STA. 116+33.35 TO STA. 343+42.15

DESIGN SPEED = 70 mph

TranSystems
2400 E. Commercial Boulevard
Suite1000
Fort Lauderdale, Florida 33308
(954) 653-4700

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

I-95 MAINLINE TYPICAL SECTION

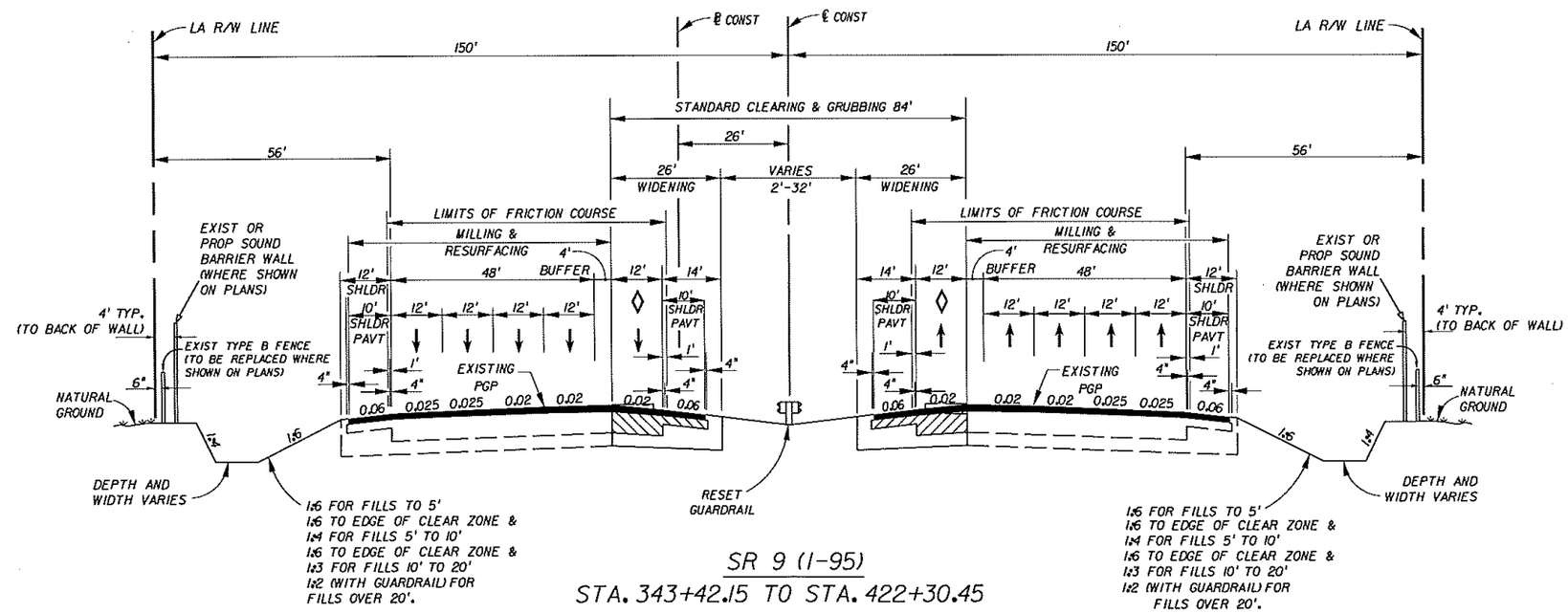
FIGURE NO. 2

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID	412420-1-22-01	FEDERAL AID PROJECT NO.	0951-605-I	COUNTY NAME	PALM BEACH
SECTION NUMBER	93220	ROAD DESIGNATION	SR 9 (I-95)	LIMITS/MILEPOST	MP 1.893 TO MP 7.688

PROJECT DESCRIPTION: Widening and Resurfacing of SR 9 (I-95) from south of Glades Road to south of Linton Boulevard, & widening/resurfacing of Glades Road (SR 808) from Butts Road to Florida Atlantic Boulevard.

PROPOSED ROADWAY TYPICAL SECTION
TEN LANE SECTION



SR 9 (I-95)

STA. 343+42.15 TO STA. 422+30.45

DESIGN SPEED = 70 mph

TranSystems
2400 E. Commercial Boulevard
Suite1000
Fort Lauderdale, Florida 33308
(954) 653-4700

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

I-95 MAINLINE TYPICAL SECTION

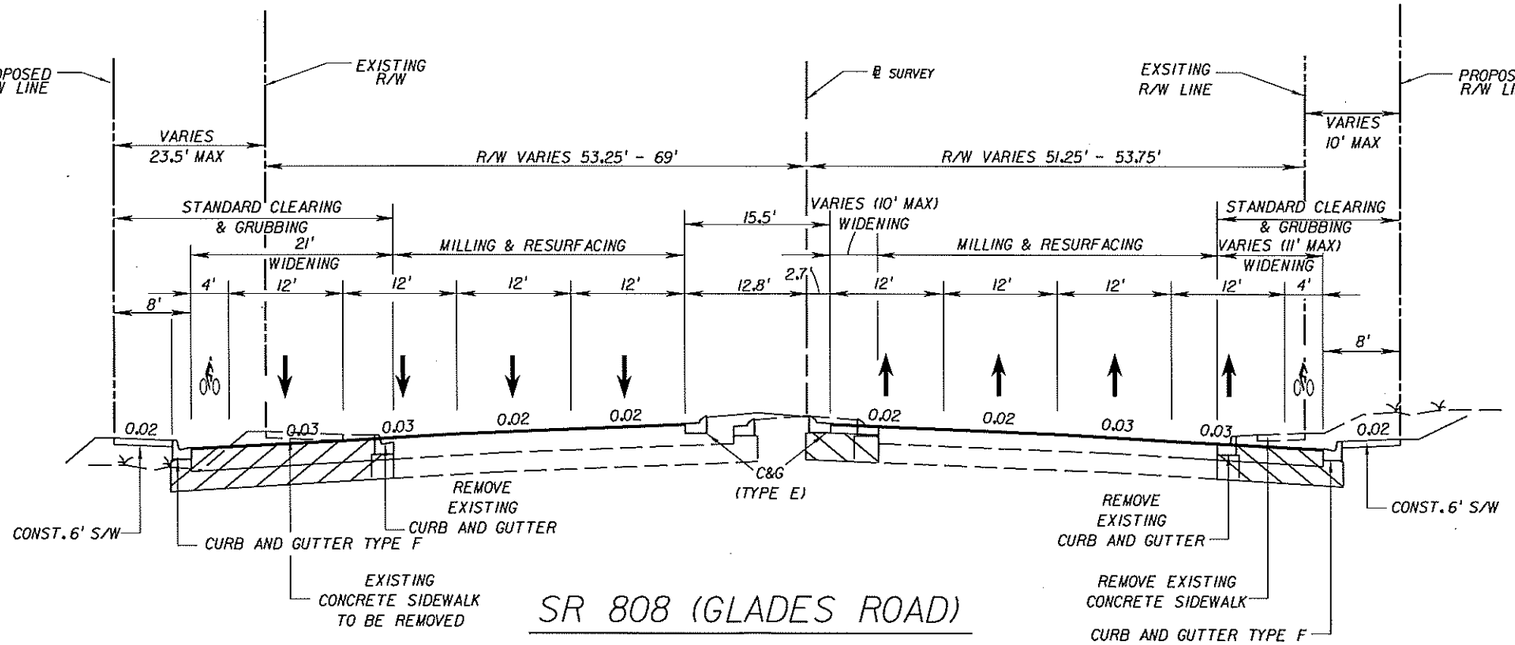
FIGURE NO. 3

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID	412420-1-22-01	FEDERAL AID PROJECT NO.	0951-605-1	COUNTY NAME	PALM BEACH
SECTION NUMBER	93220	ROAD DESIGNATION	SR 808	LIMITS/MILEPOST	MP 4.625 TO MP 4.879

PROJECT DESCRIPTION: Widening and Resurfacing of SR 9 (I-95) from south of Glades Road to south of Linton Boulevard, & widening/resurfacing of Glades Road (SR 808) from Butts Road to Florida Atlantic Boulevard.

PROPOSED ROADWAY TYPICAL SECTION



SR 808 (GLADES ROAD)

STA. 244+00.00 TO STA. 257+32.64

DESIGN SPEED = 45 MPH

TranSystems
2400 E. Commercial Boulevard
Suite1000
Fort Lauderdale, Florida 33308
(954) 653-4700

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
808	PALM BEACH	412420-1-22-01

GLADES ROAD TYPICAL SECTION

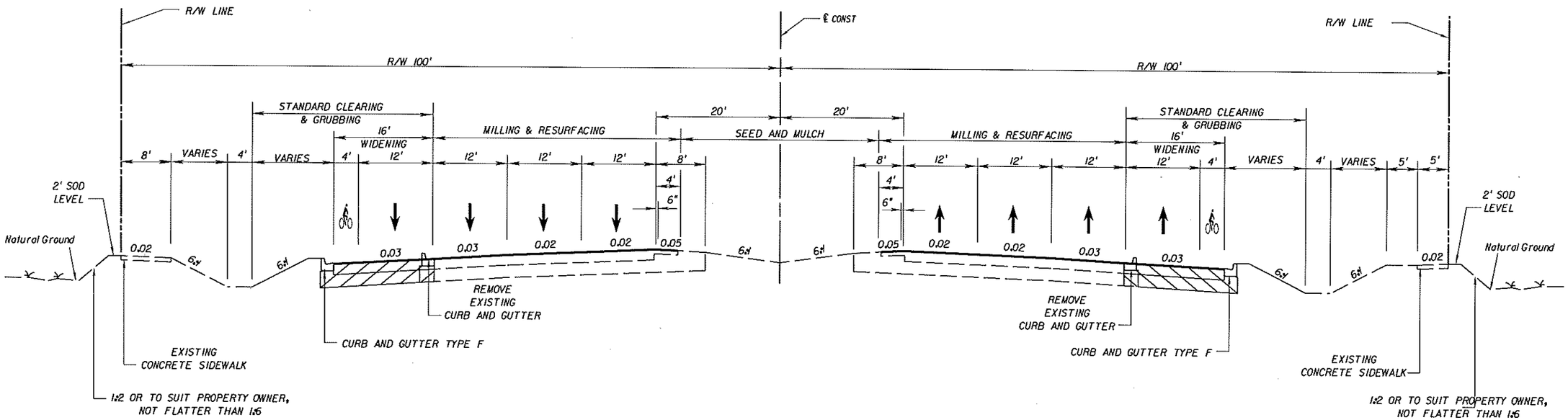
FIGURE NO. 4

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID	412420-1-22-01	FEDERAL AID PROJECT NO.	0951-605-I	COUNTY NAME	PALM BEACH
SECTION NUMBER	93220	ROAD DESIGNATION	SR 808	LIMITS/MILEPOST	MP 4.879 TO MP 6.309

PROJECT DESCRIPTION: Widening and Resurfacing of SR 9 (I-95) from south of Glades Road to south of Linton Boulevard, & widening/resurfacing of Glades Road (SR 808) from Butts Road to Florida Atlantic Boulevard.

PROPOSED ROADWAY TYPICAL SECTION



SR 808 (GLADES ROAD)

STA. 257+32.64 TO STA. 332+83.04

DESIGN SPEED = 45 MPH

TranSystems
2400 E. Commercial Boulevard
Suite1000
Fort Lauderdale, Florida 33308
(954) 653-4700

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
808	PALM BEACH	412420-1-22-01

GLADES ROAD TYPICAL SECTION

FIGURE NO. 5

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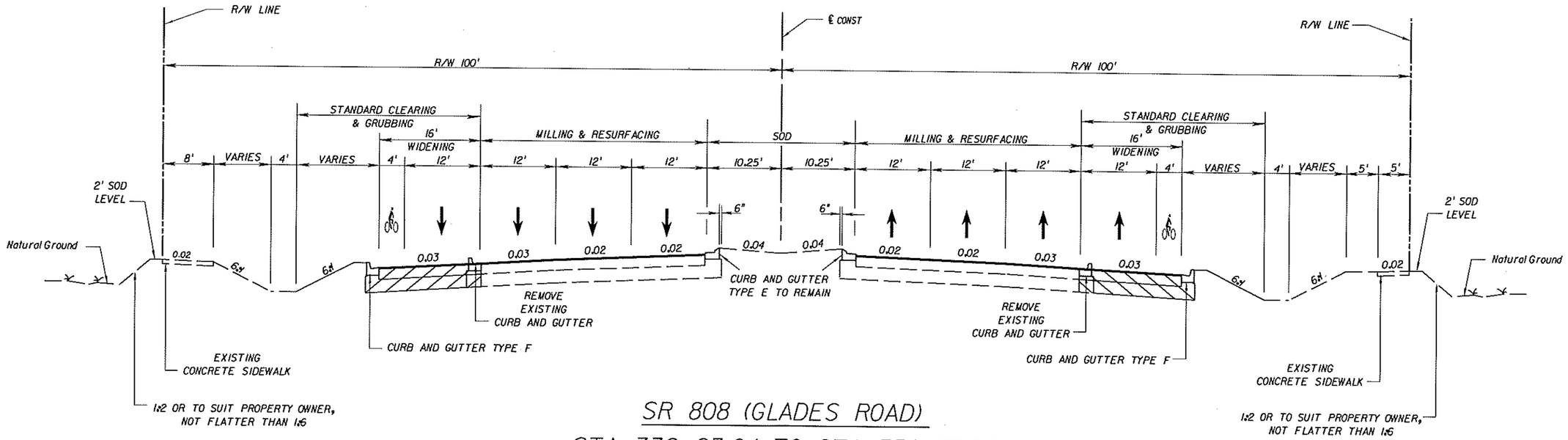
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID	412420-1-22-01	FEDERAL AID PROJECT NO.	0951-605-1	COUNTY NAME	PALM BEACH
SECTION NUMBER	93220	ROAD DESIGNATION	SR 808	LIMITS/MILEPOST	MP 6.309 TO MP 6.680

PROJECT DESCRIPTION: Widening and Resurfacing of SR 9 (I-95) from south of Glades Road to south of Linton Boulevard, & widening/resurfacing of Glades Road (SR 808) from Butts Road to Florida Atlantic Boulevard.

PROPOSED ROADWAY TYPICAL SECTION



SR 808 (GLADES ROAD)

STA. 332+83.04 TO STA. 352+57.76

DESIGN SPEED = 45 MPH

TranSystems
2400 E. Commercial Boulevard
Suite1000
Fort Lauderdale, Florida 33308
(954) 653-4700

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
808	PALM BEACH	412420-1-22-01

GLADES ROAD TYPICAL SECTION

FIGURE NO. 6

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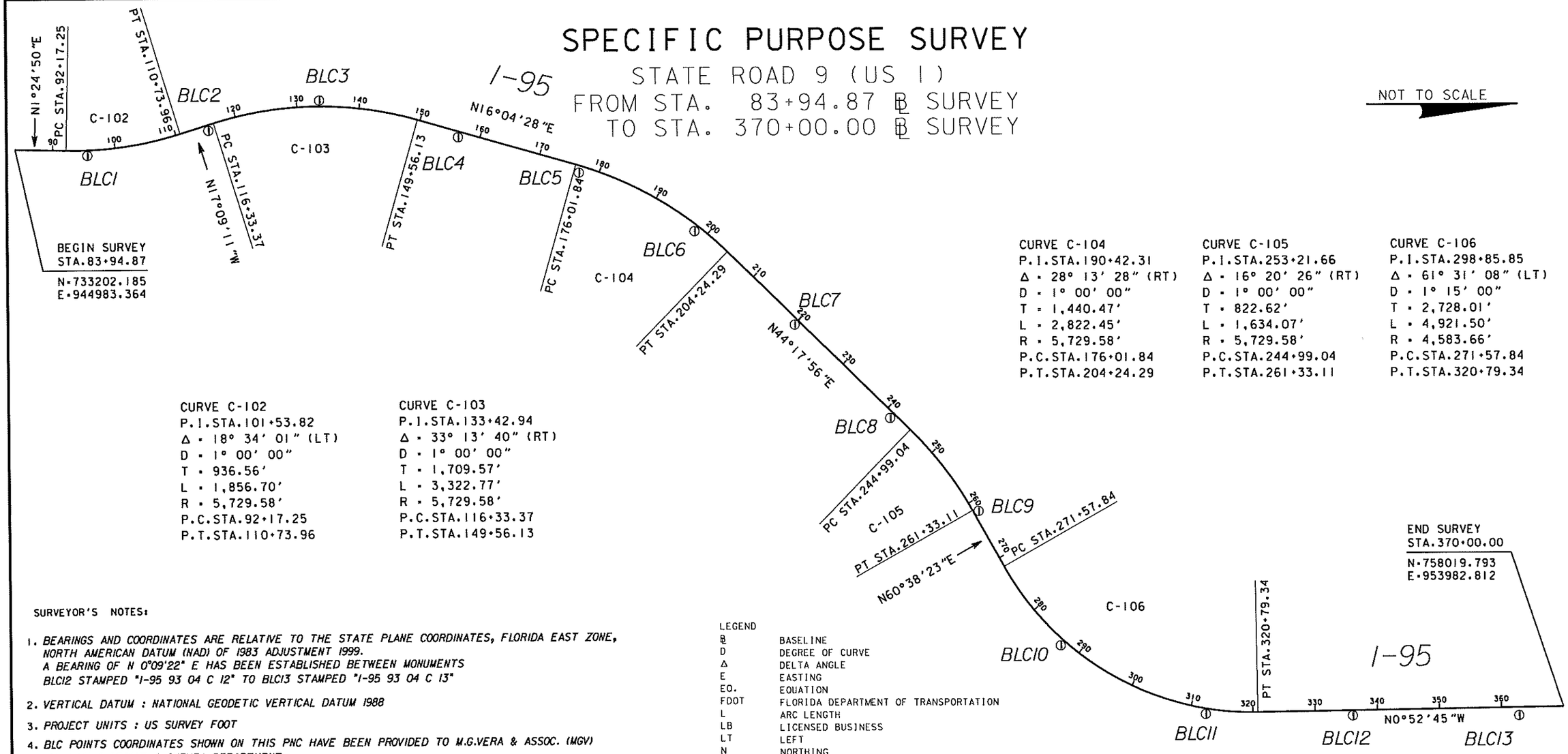
SPECIFIC PURPOSE SURVEY

STATE ROAD 9 (US 1)

FROM STA. 83+94.87 ℄ SURVEY
TO STA. 370+00.00 ℄ SURVEY

NOT TO SCALE



CURVE C-102
P.I.STA.101+53.82
Δ = 18° 34' 01" (LT)
D = 1° 00' 00"
T = 936.56'
L = 1,856.70'
R = 5,729.58'
P.C.STA.92+17.25
P.T.STA.110+73.96

CURVE C-103
P.I.STA.133+42.94
Δ = 33° 13' 40" (RT)
D = 1° 00' 00"
T = 1,709.57'
L = 3,322.77'
R = 5,729.58'
P.C.STA.116+33.37
P.T.STA.149+56.13

CURVE C-104
P.I.STA.190+42.31
Δ = 28° 13' 28" (RT)
D = 1° 00' 00"
T = 1,440.47'
L = 2,822.45'
R = 5,729.58'
P.C.STA.176+01.84
P.T.STA.204+24.29

CURVE C-105
P.I.STA.253+21.66
Δ = 16° 20' 26" (RT)
D = 1° 00' 00"
T = 822.62'
L = 1,634.07'
R = 5,729.58'
P.C.STA.244+99.04
P.T.STA.261+33.11

CURVE C-106
P.I.STA.298+85.85
Δ = 61° 31' 08" (LT)
D = 1° 15' 00"
T = 2,728.01'
L = 4,921.50'
R = 4,583.66'
P.C.STA.271+57.84
P.T.STA.320+79.34

SURVEYOR'S NOTES:

1. BEARINGS AND COORDINATES ARE RELATIVE TO THE STATE PLANE COORDINATES, FLORIDA EAST ZONE, NORTH AMERICAN DATUM (NAD) OF 1983 ADJUSTMENT 1999.
   A BEARING OF N 0°09'22" E HAS BEEN ESTABLISHED BETWEEN MONUMENTS BLC12 STAMPED "I-95 93 04 C 12" TO BLC13 STAMPED "I-95 93 04 C 13"
2. VERTICAL DATUM : NATIONAL GEODETIC VERTICAL DATUM 1988
3. PROJECT UNITS : US SURVEY FOOT
4. BLC POINTS COORDINATES SHOWN ON THIS PNC HAVE BEEN PROVIDED TO M.G.VERA & ASSOC. (MGV) BY FDOT DISTRICT 4 SURVEY DEPARTMENT.

LIMITS: GLADES ROAD TO YAMATO ROAD

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 61 G 17 FLORIDA ADMINISTRATIVE CODE PURSUANT TO SECTION 472.027 FLORIDA STATUTES. THIS MAP CONSISTING OF SHEETS ONE THROUGH THREE IS A TRUE, ACCURATE AND COMPLETE DEPICTION OF THE RESULTS OF A FIELD SURVEY PERFORMED UNDER MY DIRECTION AND COMPLETED ON 4-16-2007

SURVEYOR : MANUEL G. VERA, JR. PLS NUMBER : 5291

LEGEND

℄	BASELINE
D	DEGREE OF CURVE
Δ	DELTA ANGLE
E	EASTING
EQ.	EQUATION
FDOT	FLORIDA DEPARTMENT OF TRANSPORTATION
L	ARC LENGTH
LB	LICENSED BUSINESS
LT	LEFT
N	NORTHING
N/A	NOT APPLICABLE
P.C.	POINT OF CURVATURE
P.I.	POINT OF INTERSECTION
PK	PARKER-KALON
P.O.T.	POINT ON TANGENT
P.R.C.	POINT OF REVERSE CURVE
P.T.	POINT OF TANGENCY
R	RADIUS
RGE.	RANGE
RT	RIGHT
SEC.	SECTION
S.R.	STATE ROAD
STA.	STATION NUMBER
T	TANGENT LENGTH
TWP.	TOWNSHIP
N.T.S.	NOT TO SCALE
⊖	FDOT BRASS DISK

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G17-7.0025, F.A.C.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

MANUEL G. VERA & ASSOCIATES, INC
ENGINEERS SURVEYORS MAPPERS
13960 S.W. 47th STREET
MIAMI, FL 33175-3616
TEL: (305) 221-6210 FAX: (305) 221-1295
CERTIFICATE OF AUTHORIZATION: LB2439
MANUEL G. VERA , JR. PSM 5291

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	PALM BEACH	412420-1-22-01

PROJECT NETWORK CONTROL

SHEET NO. 7

$USER$ 10/12/2009 10:42:55 AM $FILE$

PROJECT NETWORK CONTROL TABULATION SHEET DETAILS

POINT NAME	(X) EASTING	(Y) NORTHING	SCALE FACTOR	LATITUDE	LONGITUDE	BASELINE STATION	OFFSET	(Z) ELEVATION	DESCRIPTION
BLC1	945088.875	734363.964	1.00003689	26°21'04.68918"	80°07'03.81925"	95+54.00	86.86	36.695	FOUND F.D.O.T. DISK IN CONCRETE STAMPED I-95 93 04 C01
BLC2	944705.285	736310.446	1.00003663	26°21'23.99164"	80°07'07.88965"	115+22.02	90.93	14.006	FOUND F.D.O.T. DISK IN CONCRETE STAMPED I-95 93 04 C02
BLC3	944237.647	738093.510	1.00003632	26°21'41.68139"	80°07'12.89660"	133+62.14	-93.08	17.636	FOUND F.D.O.T. DISK IN CONCRETE STAMPED I-95 93 04 C03
BLC4	944839.745	740318.816	1.00003672	26°22'03.67844"	80°07'06.11048"	156+62.08	93.20	13.461	FOUND F.D.O.T. DISK IN CONCRETE STAMPED I-95 93 04 C04
BLC5	945419.919	742257.886	1.00003710	26°22'22.84219"	80°06'59.58621"	176+87.68	113.16	9.666	FOUND F.D.O.T. DISK IN CONCRETE STAMPED I-95 93 04 C05
BLC6	946364.733	744101.603	1.00003773	26°22'41.03672"	80°06'49.05941"	198+10.33	97.96	10.806	FOUND F.D.O.T. DISK IN CONCRETE STAMPED I-95 93 04 C06
BLC7	947861.487	745696.809	1.00003873	26°22'56.73222"	80°06'32.48190"	220+09.01	87.40	13.006	FOUND F.D.O.T. DISK IN CONCRETE STAMPED I-95 93 04 C07
BLC8	949354.091	747220.624	1.00003973	26°23'11.72042"	80°06'15.95423"	241+42.05	91.42	12.469	FOUND F.D.O.T. DISK IN CONCRETE STAMPED I-95 93 04 C08
BLC9	950839.110	748632.181	1.00004073	26°23'25.59687"	80°05'59.51739"	261+90.62	-82.53	16.874	FOUND F.D.O.T. DISK IN CONCRETE STAMPED I-95 93 04 C09
BLC10	952986.920	749940.851	1.00004219	26°23'38.40773"	80°05'35.79927"	287+02.51	93.02	43.198	FOUND F.D.O.T. DISK IN CONCRETE STAMPED I-95 93 04 C10
BLC11	954085.392	752262.725	1.00004294	26°24'01.32486"	80°05'23.54001"	312+53.68	89.85	21.696	FOUND F.D.O.T. DISK IN CONCRETE STAMPED I-95 93 04 C11
BLC12	954119.687	754631.190	1.00004296	26°24'24.77763"	80°05'22.97886"	336+09.70	84.87	14.362	FOUND F.D.O.T. DISK IN CONCRETE STAMPED I-95 93 04 C12
BLC13	954126.977	757305.157	1.00004297	26°24'51.25770"	80°05'22.69084"	362+83.24	133.18	19.457	FOUND F.D.O.T. DISK IN CONCRETE STAMPED I-95 93 04 C13

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 6G7-7.0025, F.A.C.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

MANUEL G. VERA & ASSOCIATES, INC
ENGINEERS SURVEYORS MAPPERS
13960 S.W. 47th STREET
MIAMI, FL 33175-3616
TEL: (305) 221-6210 FAX: (305) 221-1295
CERTIFICATE OF AUTHORIZATION: LB2439
MANUEL G. VERA, JR. PSM 5291

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-9	PALM BEACH	412420-1-22-01

PROJECT NETWORK CONTROL

SHEET NO. 8

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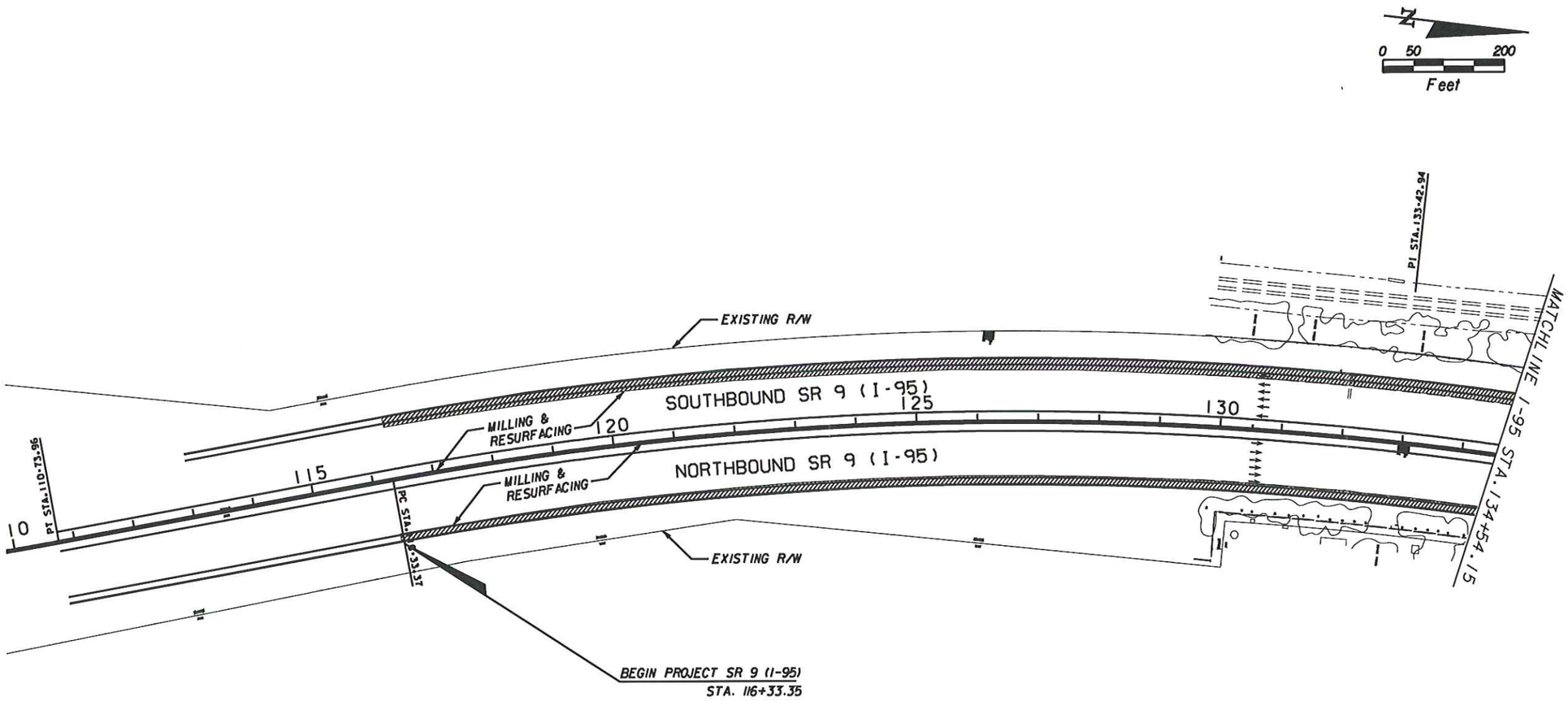

WIDENING/NEW CONSTRUCTION

SR 9 (I-95)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

TranSystems
2400 E. Commercial Blvd. Suite 1000
Fort Lauderdale, Florida 33308
(954) 653-4700
N. Craig Miller, P.E. 13147

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

CONCEPTUAL ROADWAY PLAN

SHEET NO. 9

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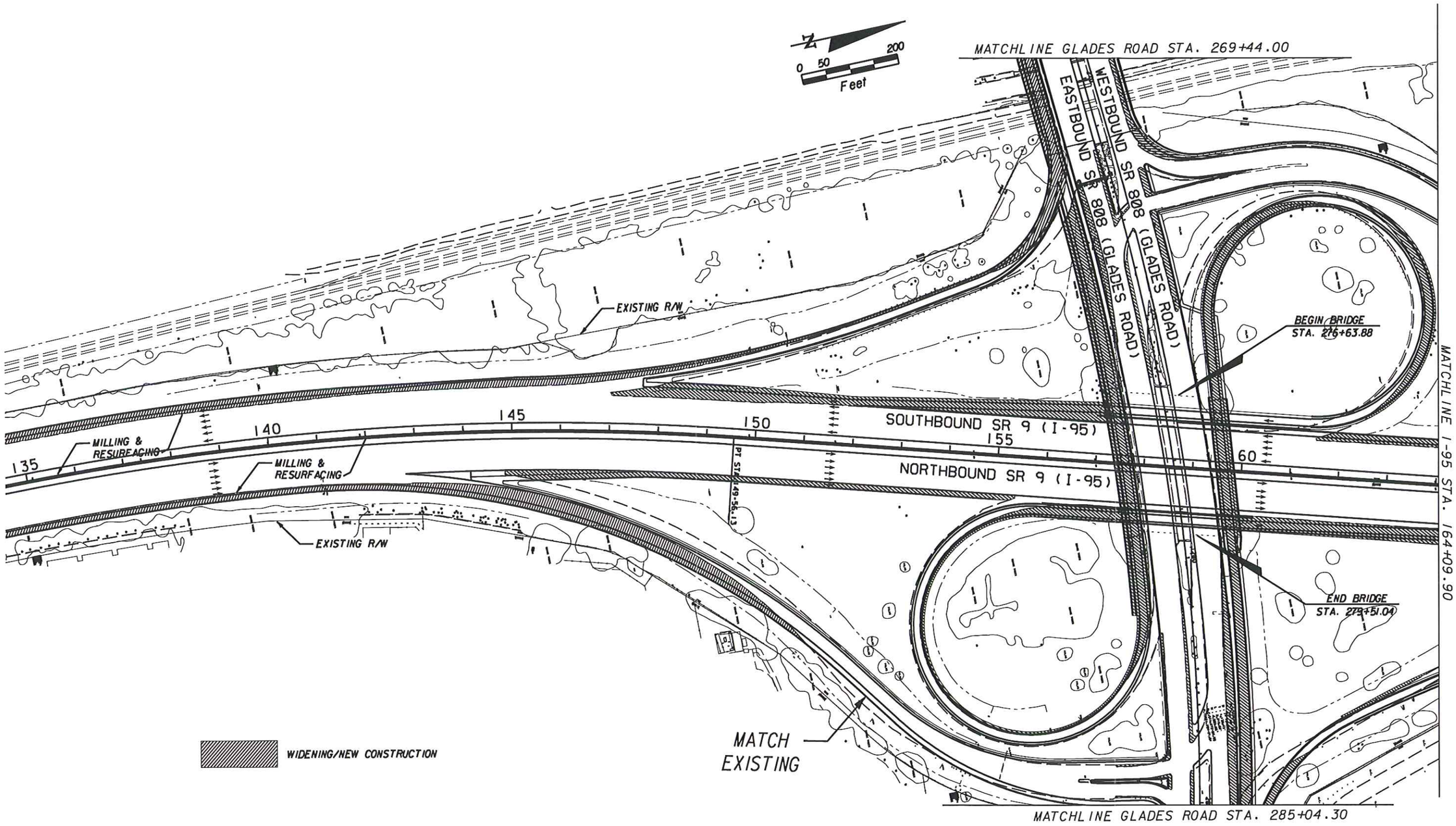

SR 9 (I-95)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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Fort Lauderdale, Florida 33308
(954) 653-4700
N. Craig Miller, P.E. 13147

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

CONCEPTUAL ROADWAY PLAN

SHEET NO. 10

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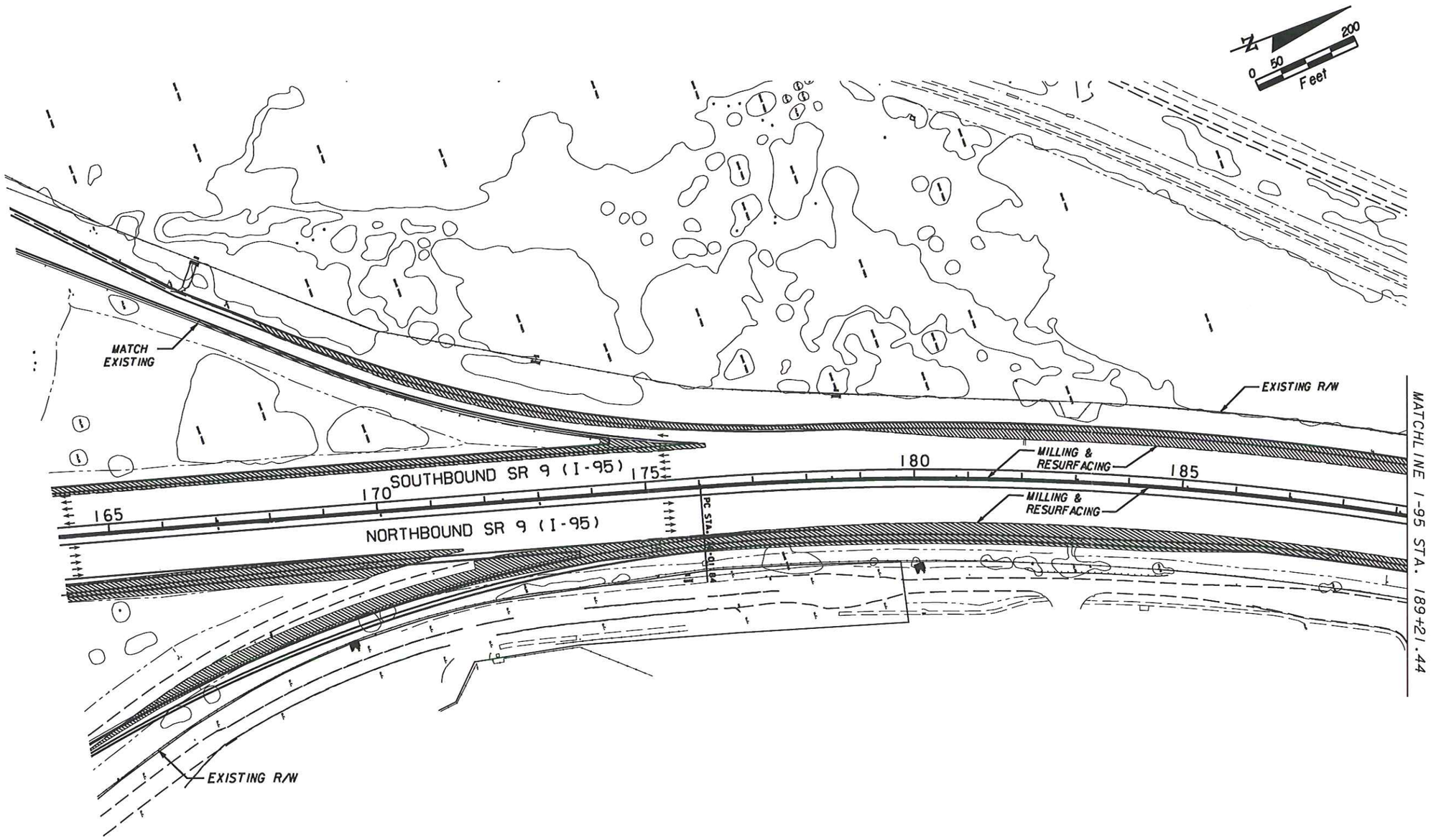

WIDENING/NEW CONSTRUCTION

SR 9 (I-95)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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Fort Lauderdale, Florida 33308
(954) 653-4700
N. Craig Miller, P.E. 13147

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

CONCEPTUAL ROADWAY PLAN

SHEET NO. 11

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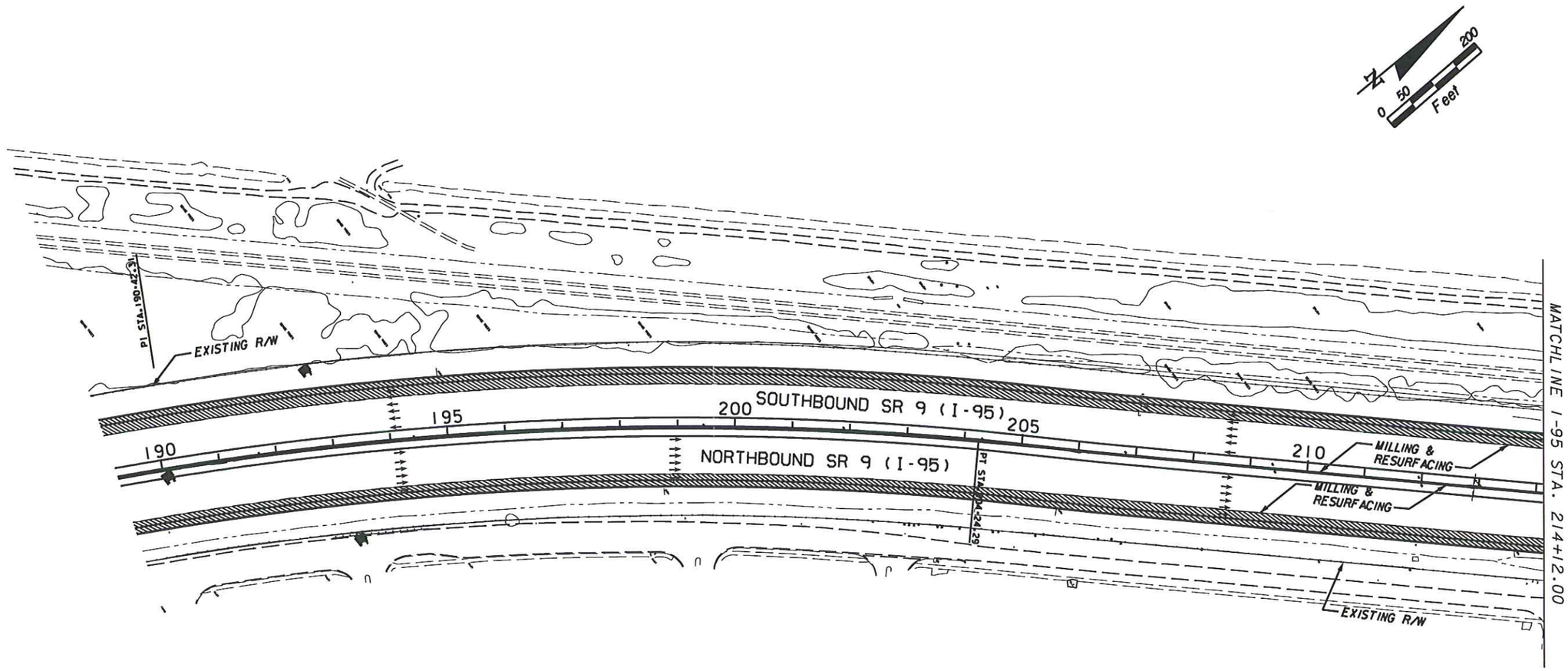

WIDENING/NEW CONSTRUCTION

SR 9 (I-95)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

TranSystems
2400 E. Commercial Blvd. Suite 1000
Fort Lauderdale, Florida 33308
(954) 653-4700
N. Craig Miller, P.E. 13147

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

CONCEPTUAL ROADWAY PLAN

SHEET NO. 12

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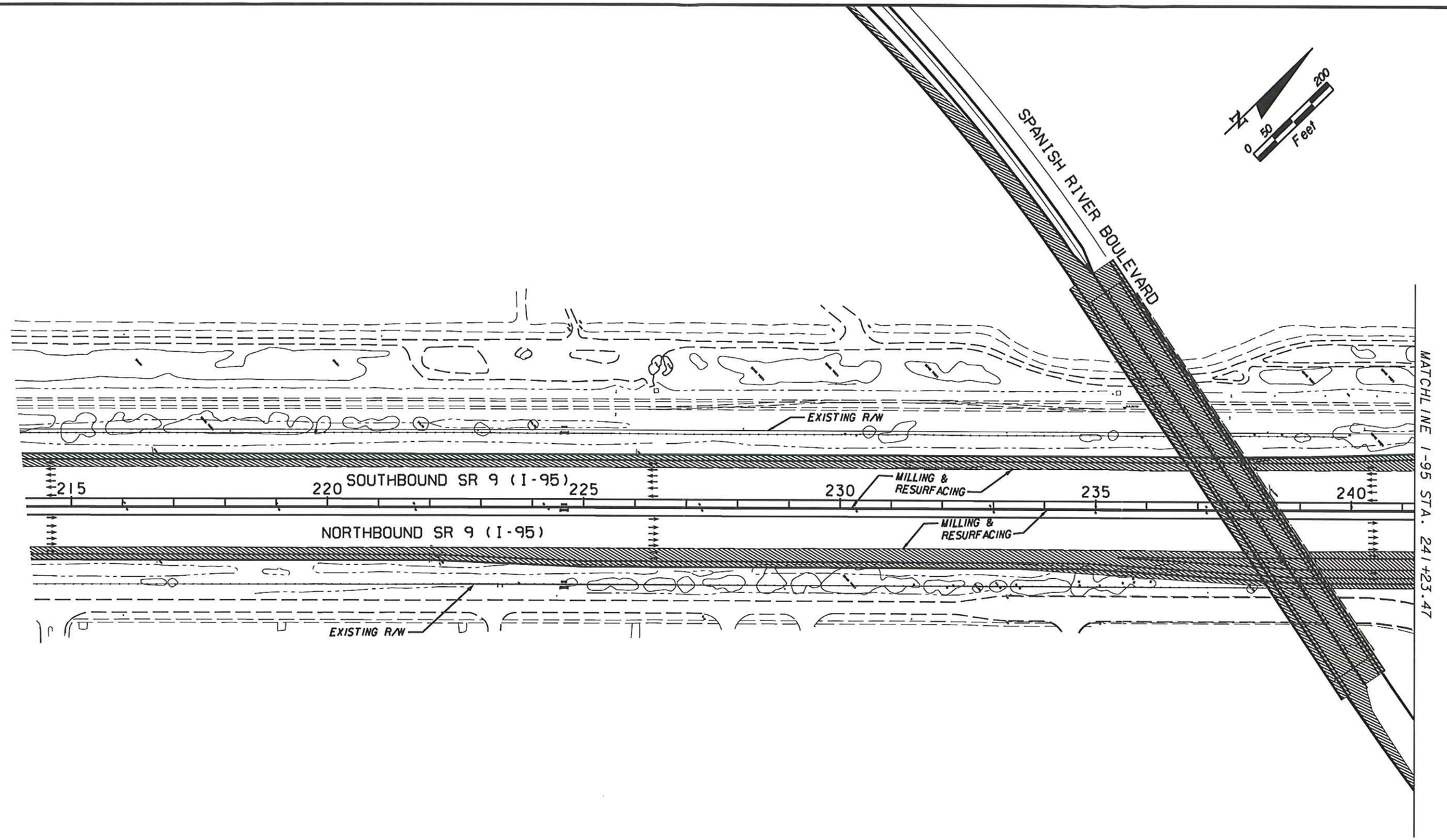

SR 9 (I-95)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

TranSystems
2400 E. Commercial Blvd. Suite 1000
Fort Lauderdale, Florida 33308
(954) 653-4700
N. Craig Miller, P.E. 13147

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

CONCEPTUAL ROADWAY PLAN

SHEET NO. 13

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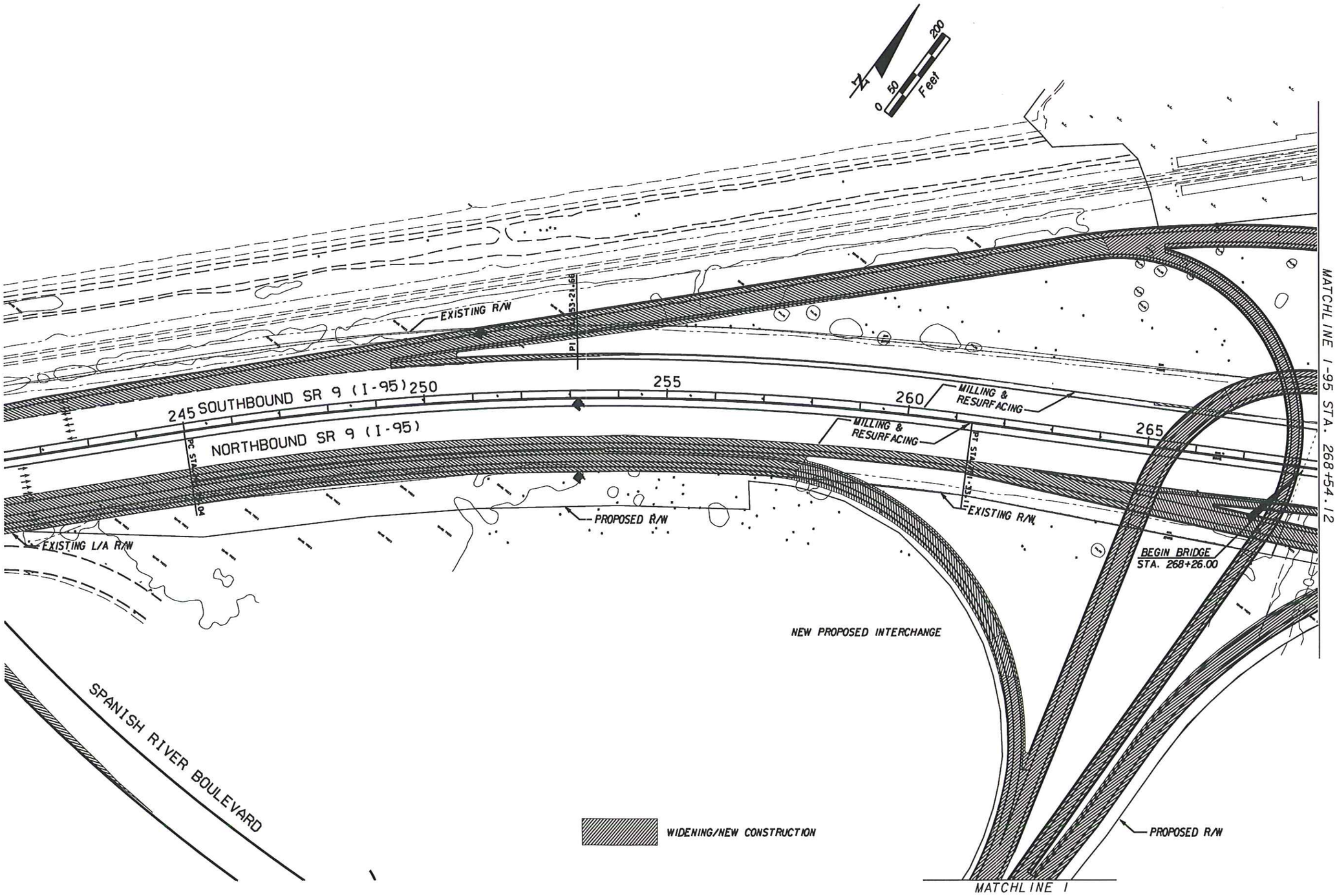

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

TranSystems
2400 E. Commercial Blvd. Suite 1000
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

CONCEPTUAL ROADWAY PLAN

SHEET NO. 14

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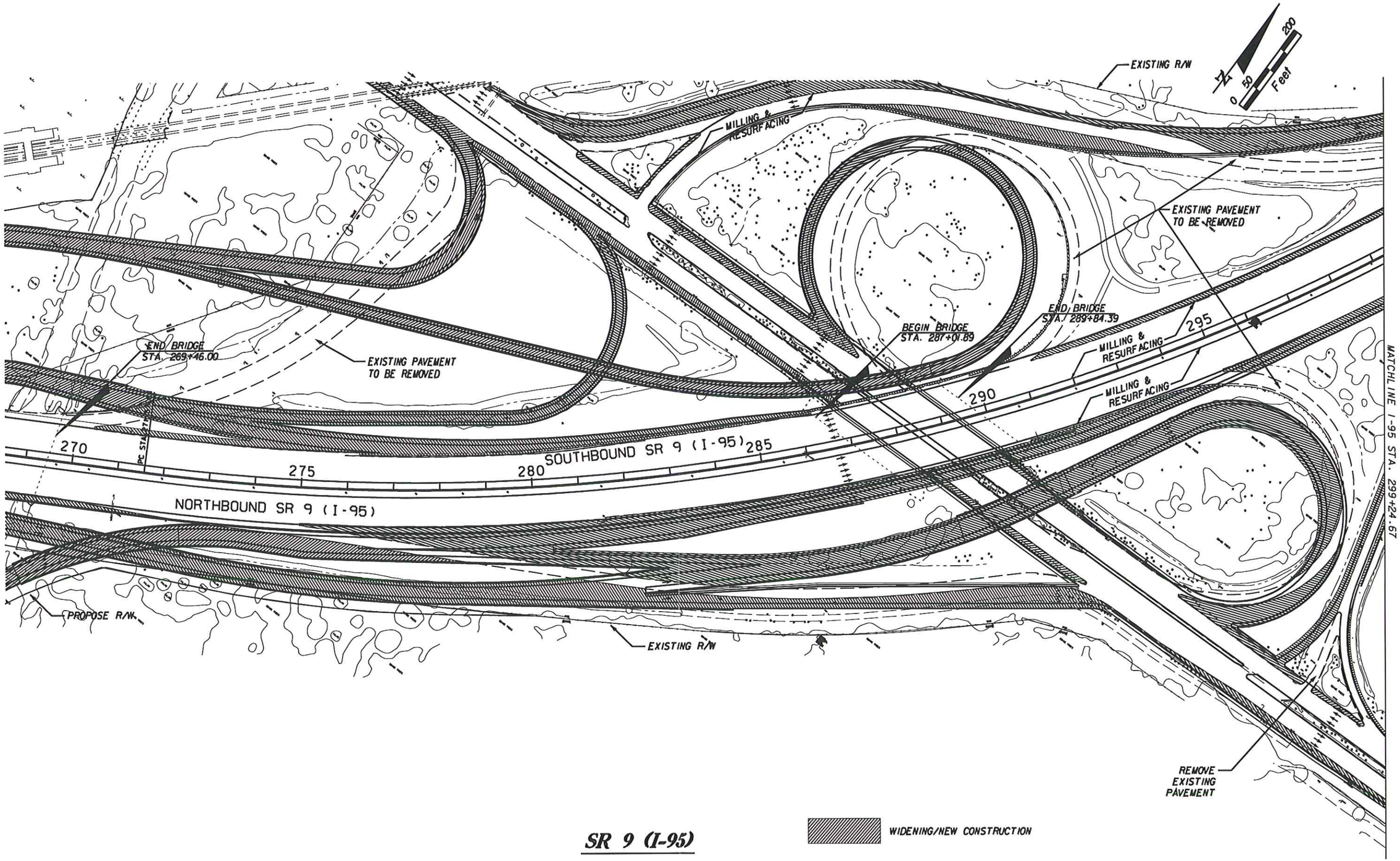

SR 9 (I-95)

WIDENING/NEW CONSTRUCTION

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

TranSystems
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Fort Lauderdale, Florida 33308
(954) 653-4700
N. Craig Miller, P.E. 13147

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

CONCEPTUAL ROADWAY PLAN

SHEET NO. 15

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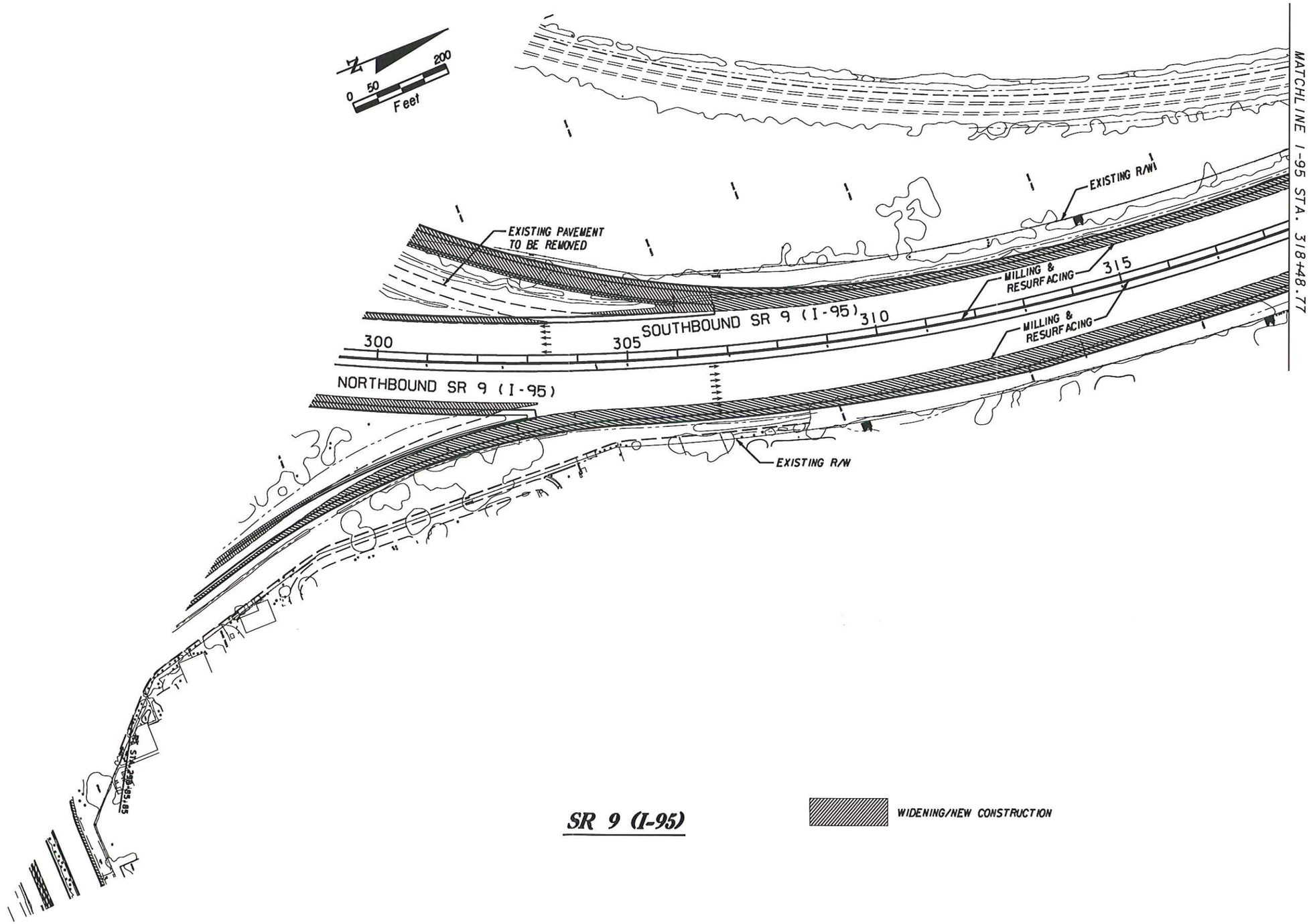

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

CONCEPTUAL ROADWAY PLAN

SHEET NO. 16

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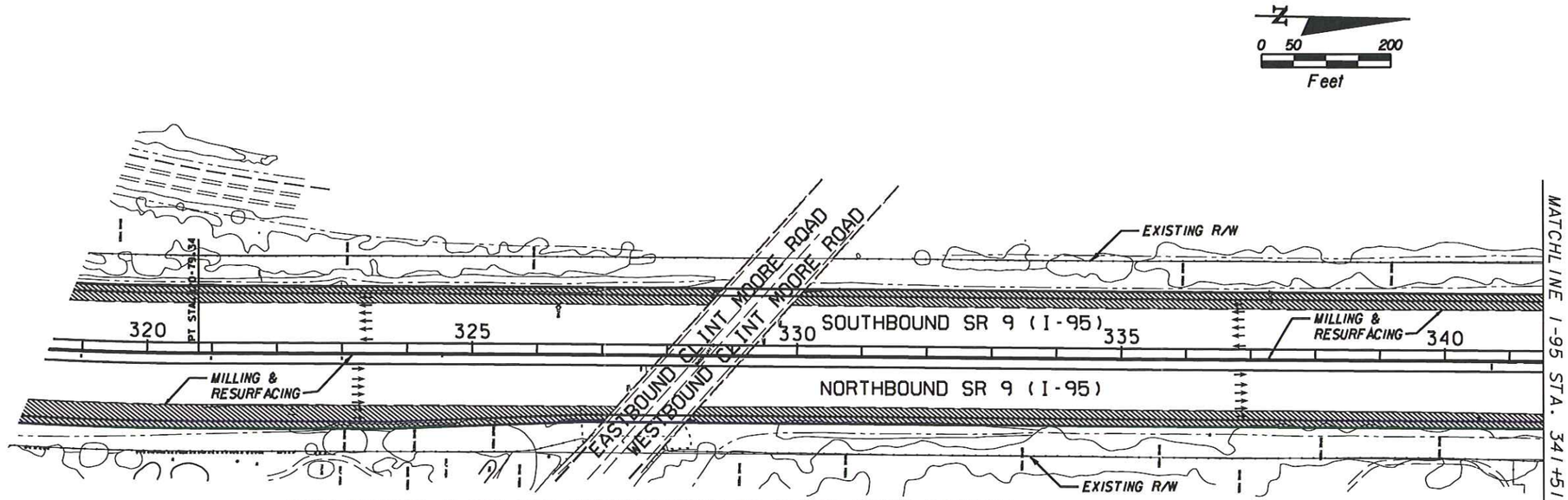

(SEE BRIDGE PLANS FOR MODIFICATION TO CLINT MOORE BRIDGE)

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

CONCEPTUAL ROADWAY PLAN

SHEET NO. 17

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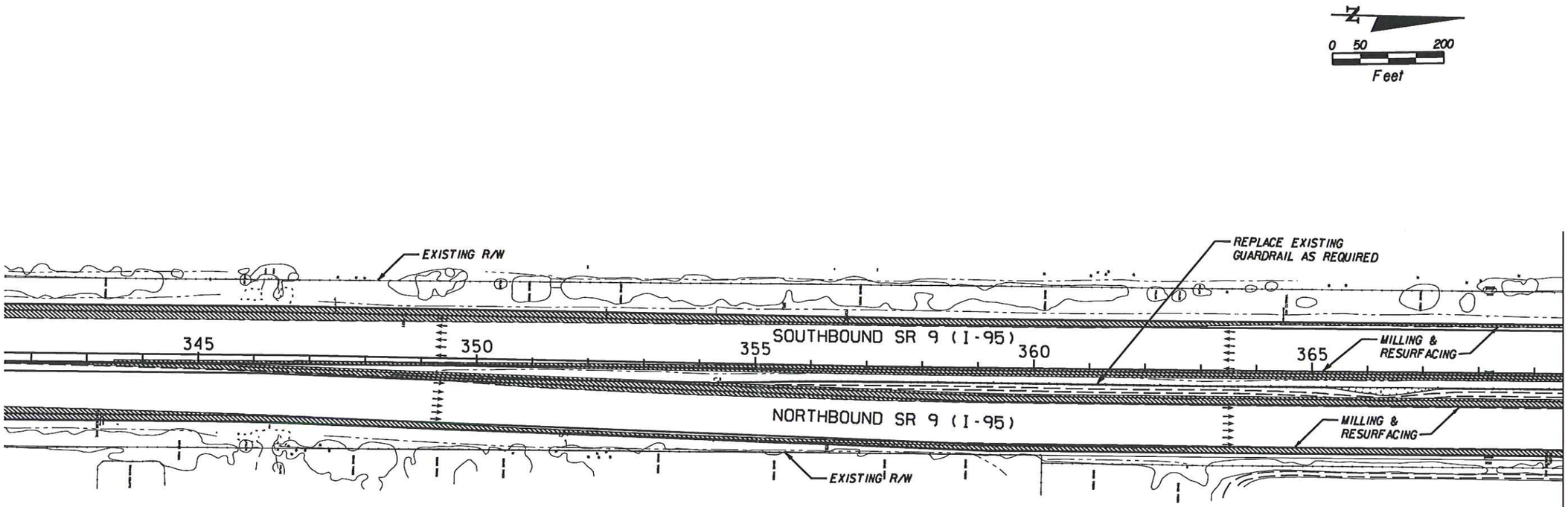

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

CONCEPTUAL ROADWAY PLAN

SHEET NO. 18

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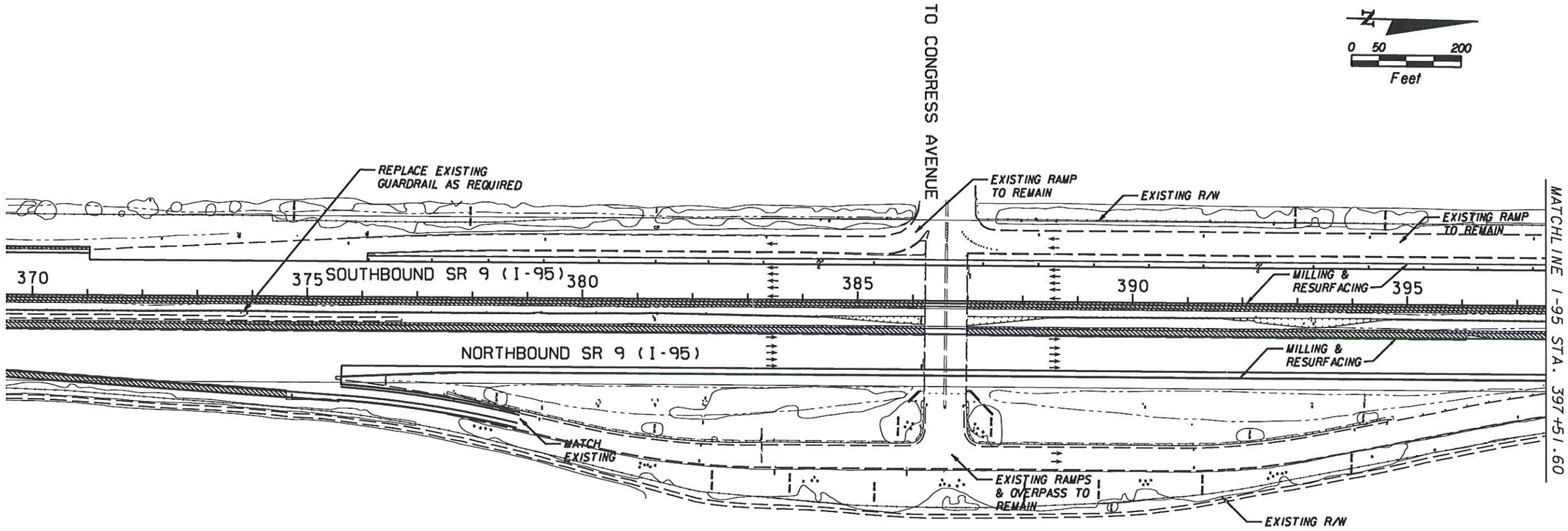

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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CONCEPTUAL ROADWAY PLAN

SHEET NO. 19

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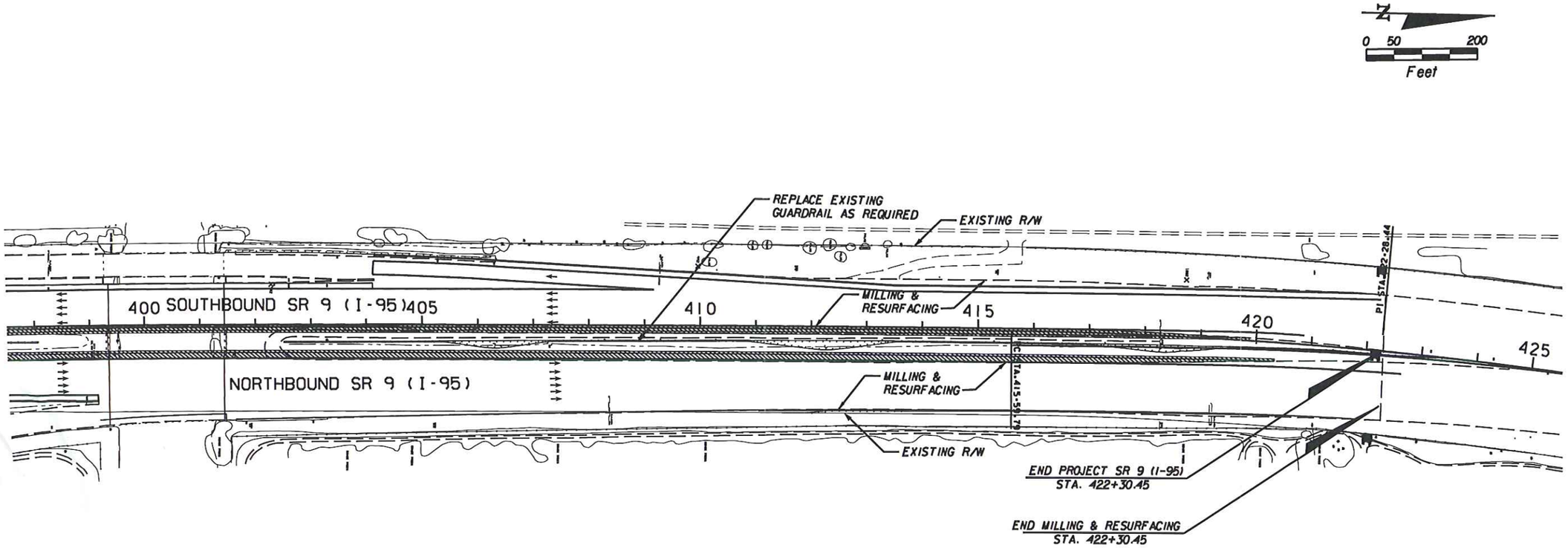

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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CONCEPTUAL ROADWAY PLAN

SHEET NO. 20

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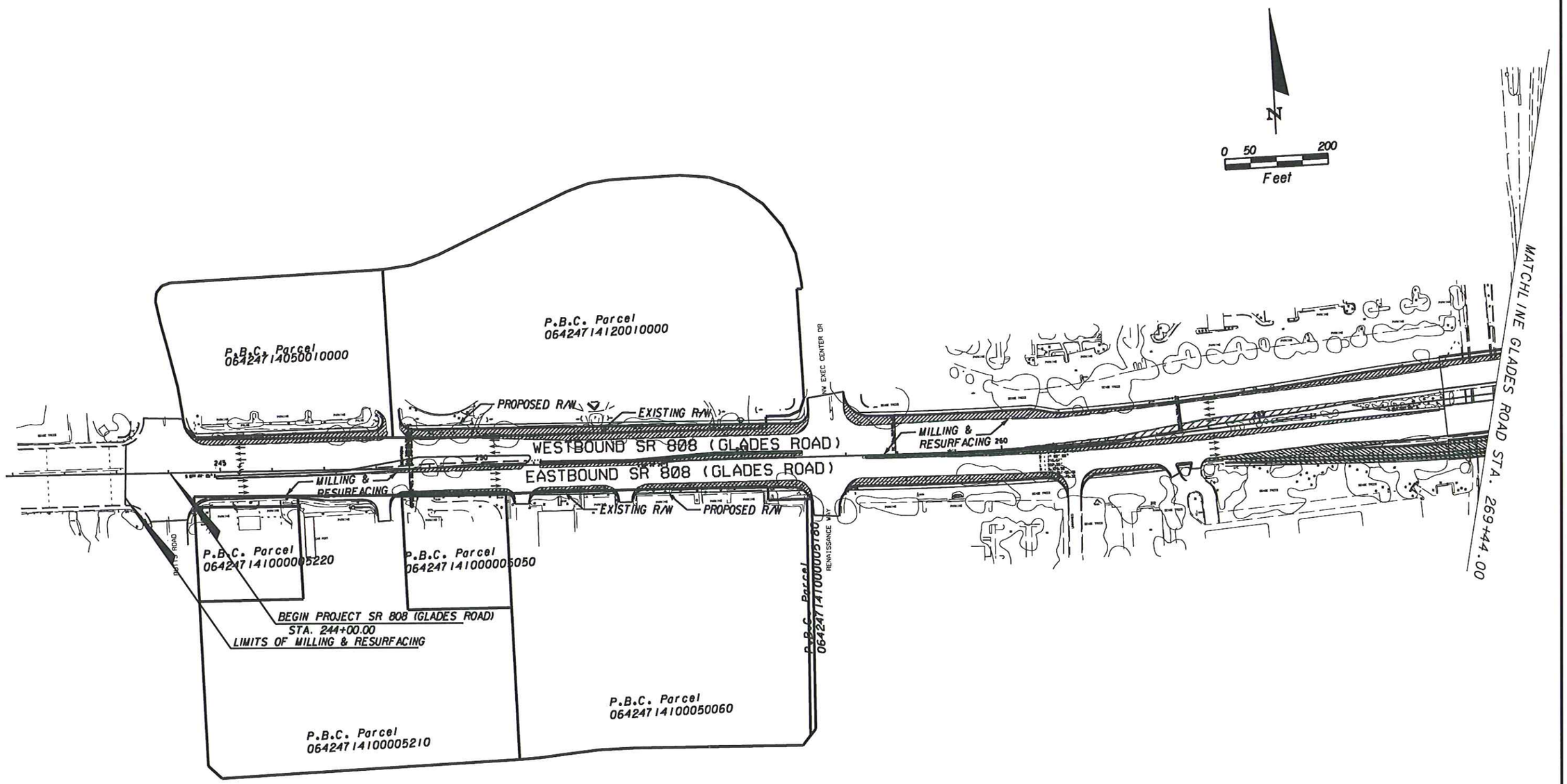

SR 808 (GLADES ROAD)

REVISIONS					
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

CONCEPTUAL ROADWAY PLAN

SHEET NO. 21

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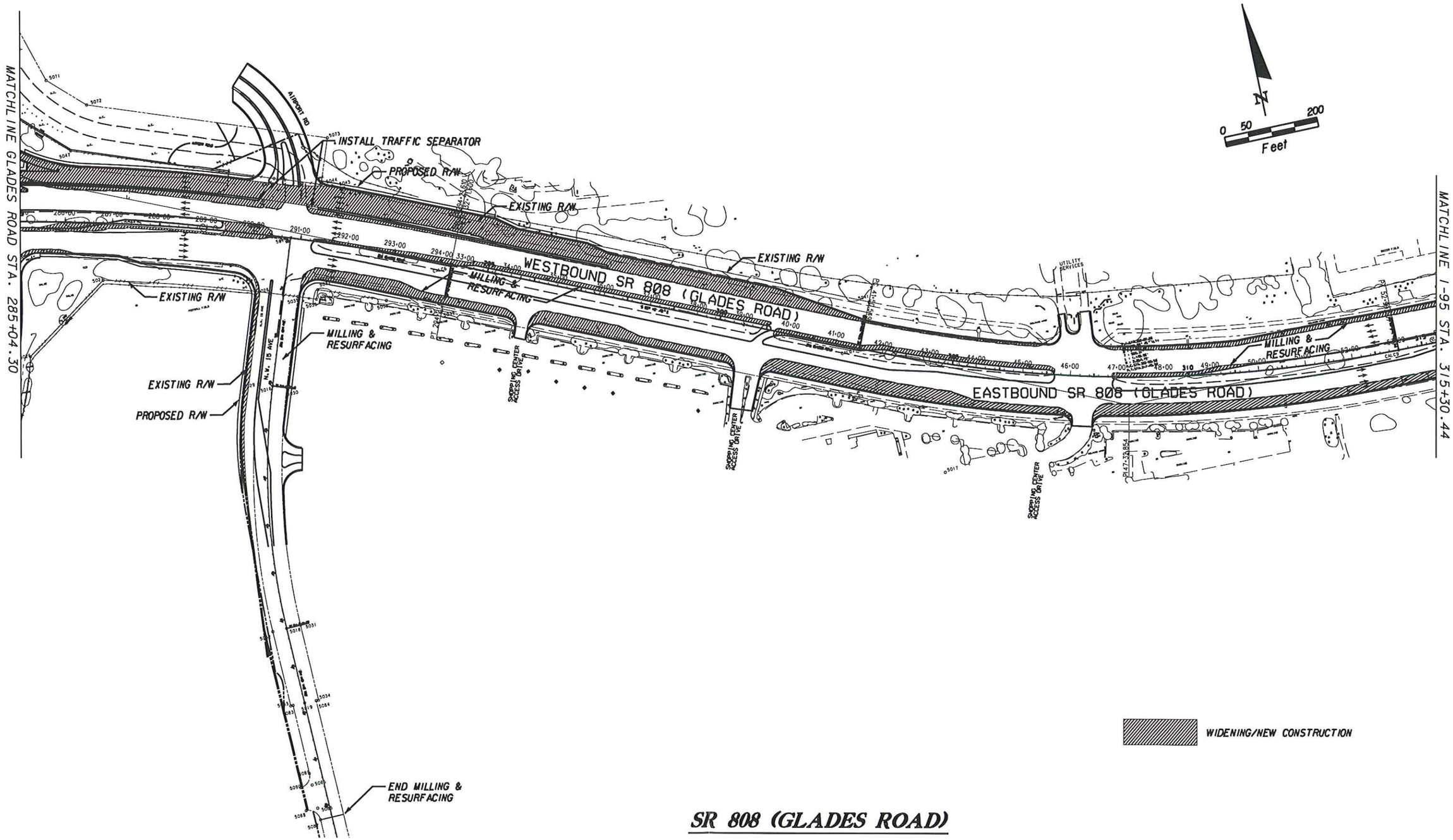

SR 808 (GLADES ROAD)

REVISIONS					
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

CONCEPTUAL ROADWAY PLAN

SHEET NO. 22

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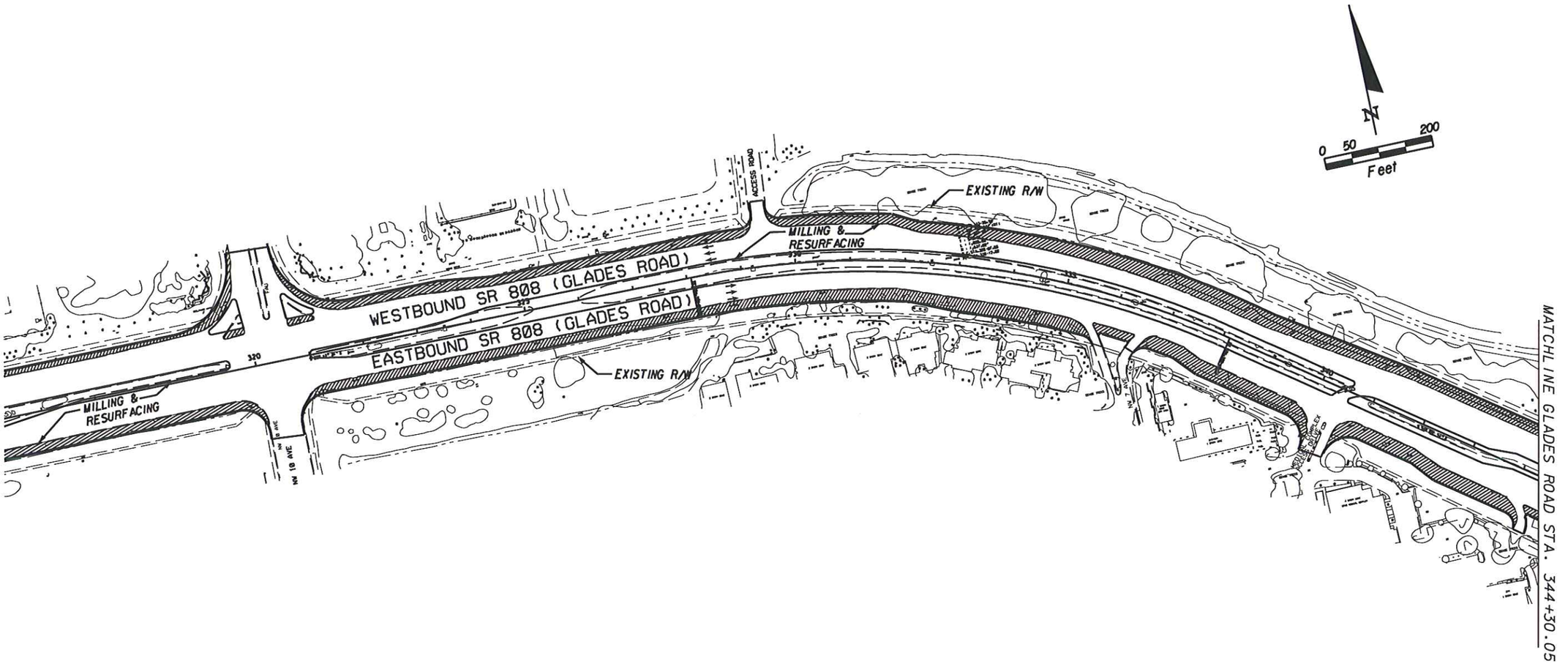

WIDENING/NEW CONSTRUCTION

SR 808 (GLADES ROAD)

REVISIONS					
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	PALM BEACH	412420-1-22-01

CONCEPTUAL ROADWAY PLAN

SHEET NO. 23

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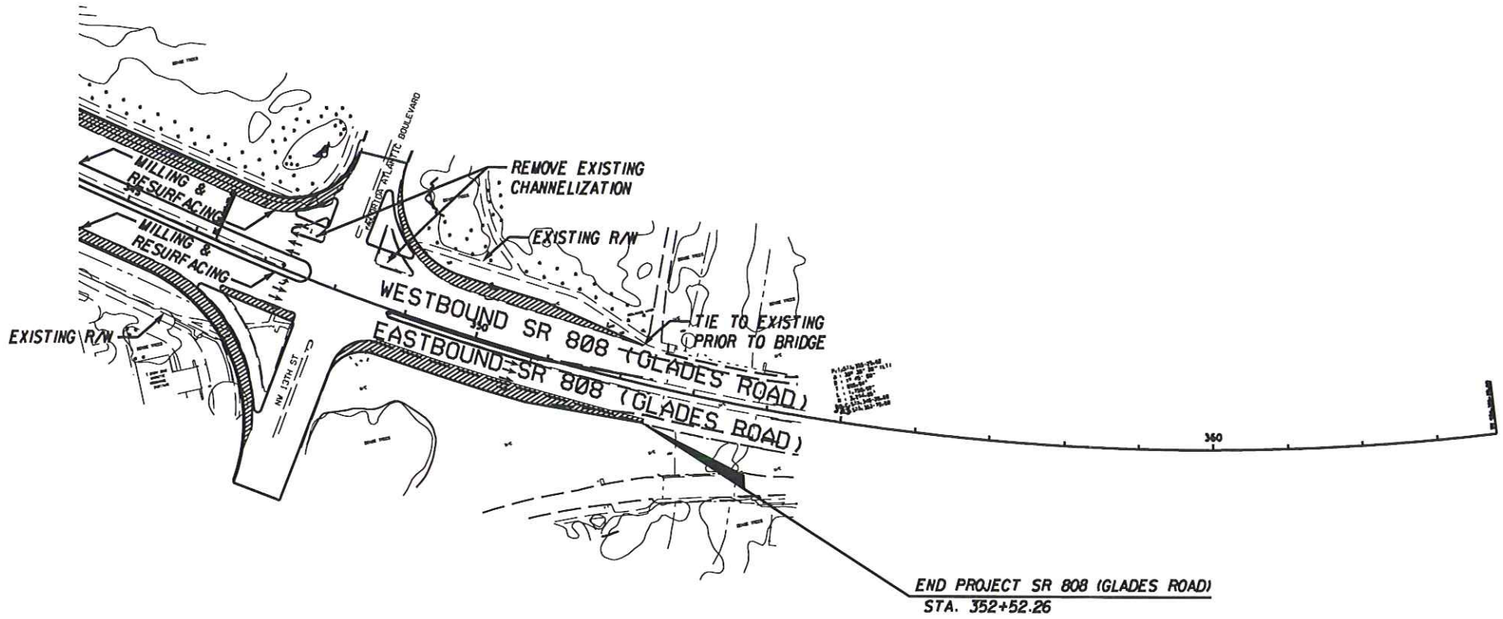

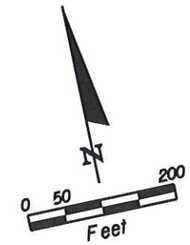

SR 808 (GLADES ROAD)

WIDENING/NEW CONSTRUCTION

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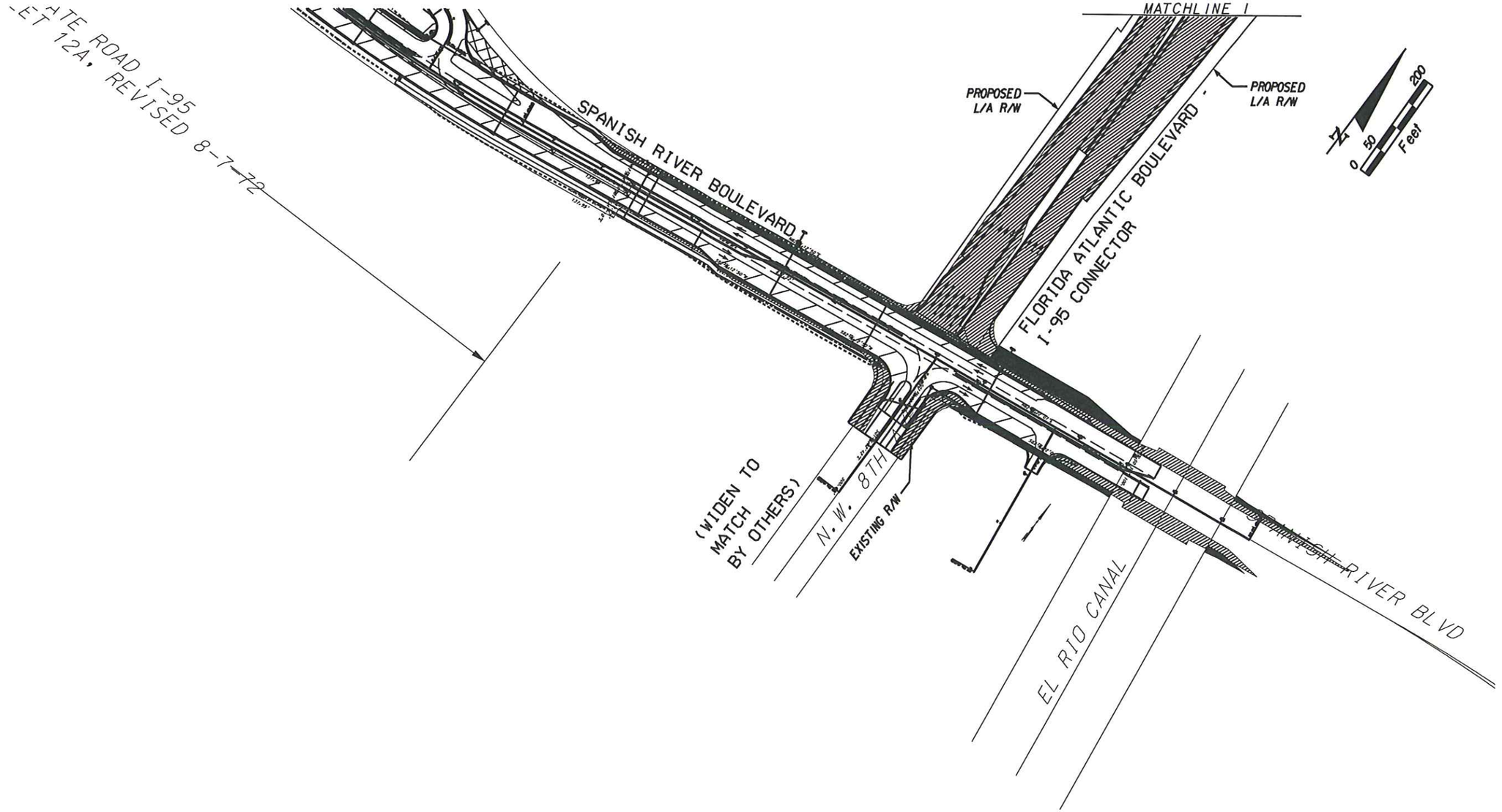
CONCEPTUAL ROADWAY PLAN

SHEET NO. 24

8/5/2009 3:07:11 PM $FILE$



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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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CONCEPTUAL ROADWAY PLAN

SHEET NO. 25

2/3/2010 4:46:14 PM $FILE$