

**DRAFT
TYPICAL SECTION REPORT**

**GANDY BOULEVARD (SR 694) PD&E STUDY
FROM WEST OF US 19 TO EAST OF 4th STREET
PINELLAS COUNTY**

**Work Program Item Segment No: 256931 1
Federal Aid Project No: N/A**

**This project evaluates improvement alternatives for Gandy Boulevard (SR 694) from
west of US 19 to east of 4th Street
Pinellas County, Florida.**

Prepared for:

**Florida Department of Transportation
District Seven
11201 North McKinley Drive
Tampa, Florida 33612-6456**

September 2001

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September 2001

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SECTION 1

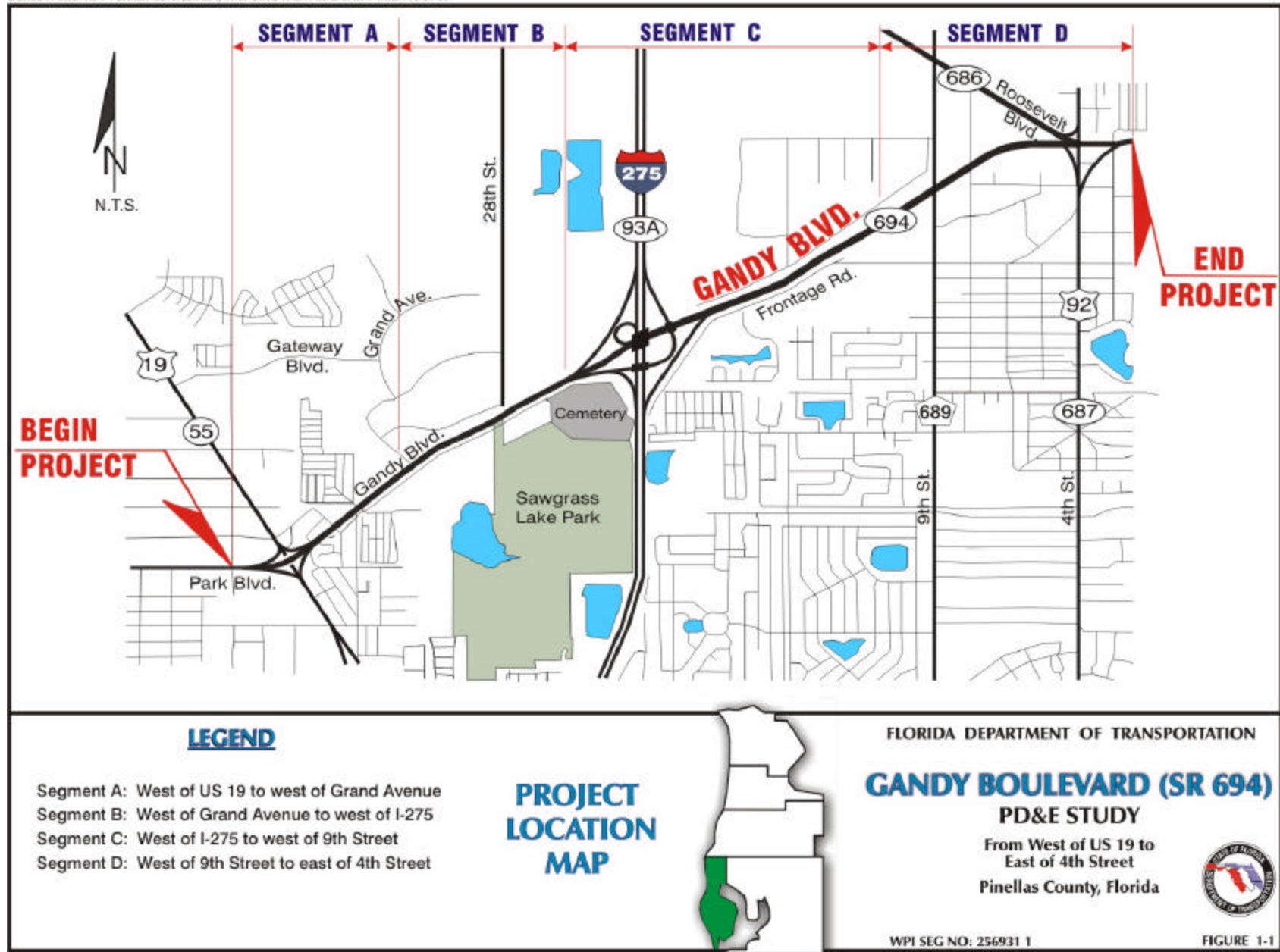
INTRODUCTION

The Florida Department of Transportation (Department) is conducting a Project Development and Environment (PD&E) Study to evaluate improvement alternatives along Gandy Boulevard (SR 694) from west of US 19 to east of 4th Street in the cities of Pinellas Park and St. Petersburg in Pinellas County, Florida. The project location map in Figure 1-1 illustrates the location and limits of the Study.

1.1 PURPOSE

The objective of the PD&E Study is to provide documented environmental and engineering analyses, which will help the Department and the Federal Highway Administration (FHWA) reach a decision on the type, conceptual design, and location of the necessary improvements along the Gandy Boulevard (SR 694) corridor to accommodate future transportation needs in a safe and efficient manner.

This report documents the need for the project and presents the procedures used to develop and evaluate various improvement alternatives as they relate to the transportation facility. Engineering data and information about the environmental characteristics of the area, which are essential to the alignment and analytical decision-making process, has been collected as part of the 1996 Gandy Major Investment Study (MIS) and is being updated as necessary. Once sufficient data is available, alignment criteria will be used to refine the alternatives. The comparison of alternatives is to be based on a variety of parameters using a matrix format outlined in the MIS Study Screen Two Evaluation Report and other factors identified during this Study effort. The MIS Study identified the alternative that will have the least impact while providing the necessary improvements and is being refined in the PD&E Study phase along with the No-Build option.



1.2 PROJECT DESCRIPTION

Through the PD&E Study process, the Department is evaluating the improvement alternatives along the Gandy Boulevard (SR 694) corridor. The Gandy Boulevard (SR 694) corridor is primarily an east/west facility, which in its entirety, extends from a western terminus at Gulf Boulevard in Pinellas County to an eastern terminus at Bayshore Boulevard in Hillsborough County. The Gandy Boulevard (SR 694) corridor is functionally classified as an east/west principal urban arterial highway and is part of the Florida Intrastate Highway System (FIHS). The facility also serves as a major hurricane evacuation route for residents in Pinellas County. The proposed PD&E Study limits encompass the portion of Gandy Boulevard (SR 694) from west of the US 19/Gandy Boulevard (SR 694) interchange to east of 4th Street and include proposed interchanges at: 4th Street and Gandy Boulevard (SR 694); 9th Street and Gandy Boulevard (SR 694); and interchange improvements at Interstate 275. The total length of the Study is approximately 3.9 miles. This project has been evaluated in the MIS, which was initiated in 1996.

For PD&E Studies, projects are divided into segments based on the existing land use, interchange locations, and projected traffic volumes for the design year. Because the portion of Gandy Boulevard (SR 694) from west of US 19 to east of 4th Street contains similar land use characteristics and projected traffic volumes, this project will be divided into four segments based on the new interchanges that are proposed in the corridor. The segments of the project are identified as follows:

- Segment A: West of US 19 to west of Grand Avenue
- Segment B: West of Grand Avenue to west of I-275
- Segment C: West of I-275 to west of 9th Street
- Segment D: West of 9th Street to east of 4th Street

SECTION 2

EXISTING CONDITIONS

Gandy Boulevard (SR 694) is developed with mixed commercial, industrial and residential land use along both sides of the roadway for the length of the project. Vacant land currently exists along the north side of Gandy Boulevard (SR 694) between Gateway Center and 9th Street; however, developments are planned for most of this area of the project. Several large commercial developments are scattered along the project corridor. The existing posted speed limits along the Gandy Boulevard (SR 694) corridor vary between 40 miles per hour (mph) and 50 mph throughout the project limits.

This section will examine the existing roadway typical sections relevant during the analysis of the proposed alternatives for this PD&E Study along Gandy Boulevard (SR 694) and in the vicinity of the interchanges. These existing roadway and bridge typical sections describe or define the following facilities located within the project limits:

- Roadway sections along Gandy Boulevard (SR 694) between west of US 19 and east of 4th Street;
- Roadway sections for the cross roads where new interchange alternatives will be evaluated (US 19, Gateway Center [28th Street], 9th Street, Roosevelt Boulevard, and 4th Street);
- The I-275 overpass;
- The existing ramps and bridges associated with the interchanges.

2.1 EXISTING GANDY BOULEVARD (SR 694) TYPICAL SECTIONS

Gandy Boulevard (SR 694) throughout the project limits from west of US 19 to east of 4th Street displays many various types of typical sections. Since some project segments have a unique existing typical section, they will be used to define the existing Gandy Boulevard (SR 694) within the project limits. It should be noted that pavement has been added to the roadway since the original construction to create right turn lanes along areas throughout the project. Right turn lanes were added along eastbound and westbound Gandy Boulevard (SR 694) at Grand Avenue and 16th Street.

The City of St. Petersburg is currently widening Gandy Boulevard (SR 694) from four-lanes to six-lanes. The design calls for an addition of one lane in each direction within the existing median from 28th Street to 9th Street.

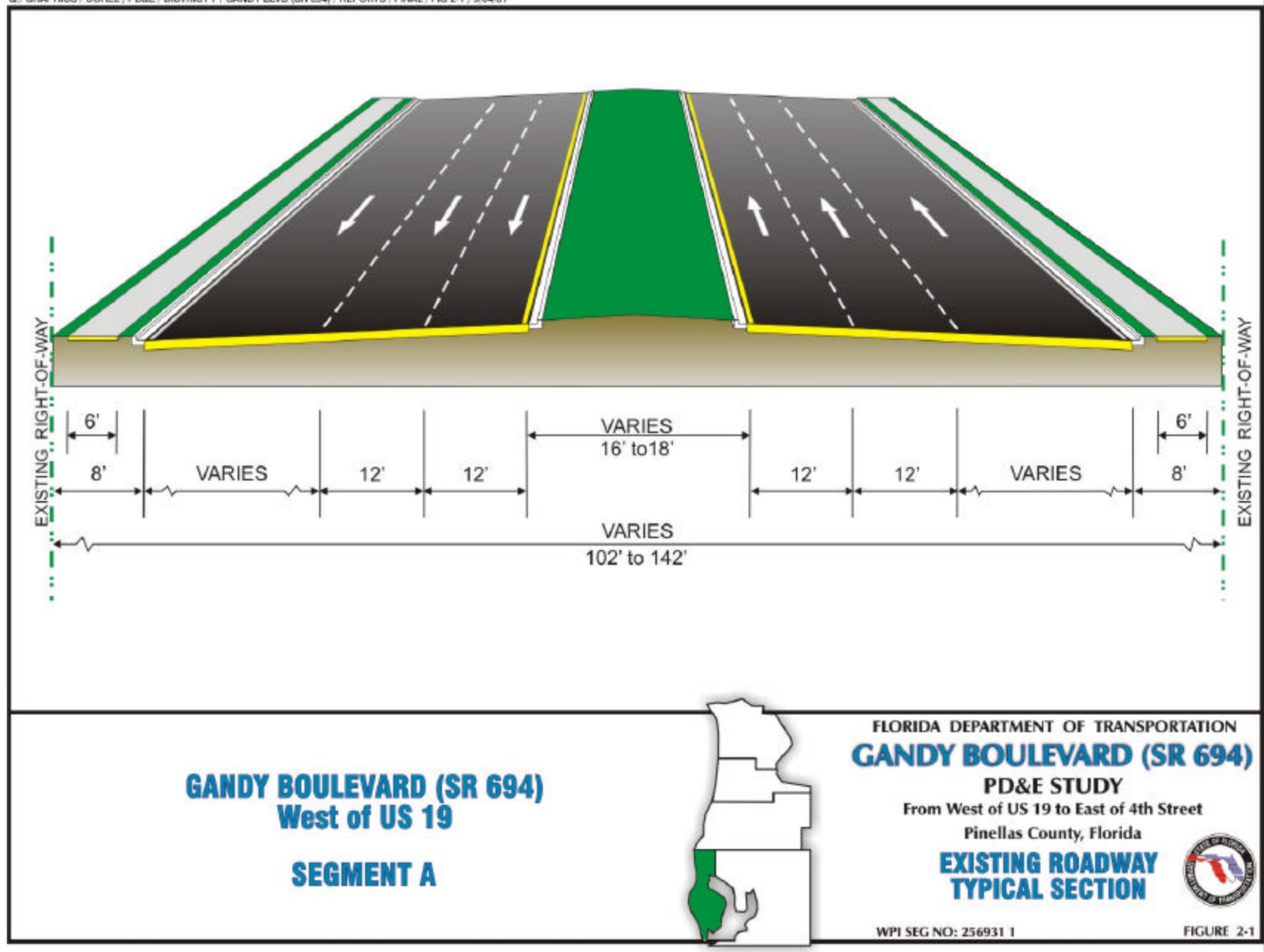
2.1.1 Segment A

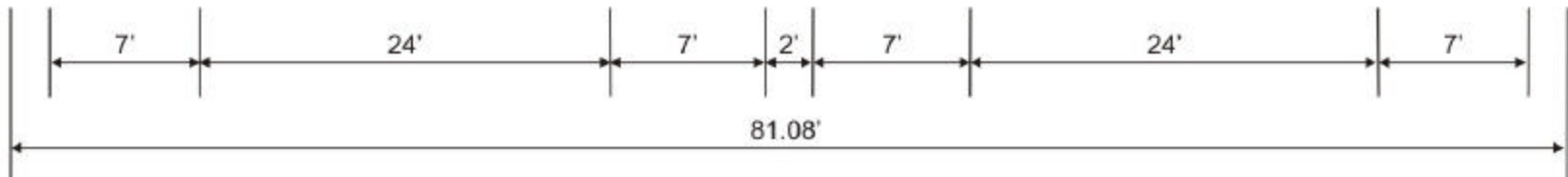
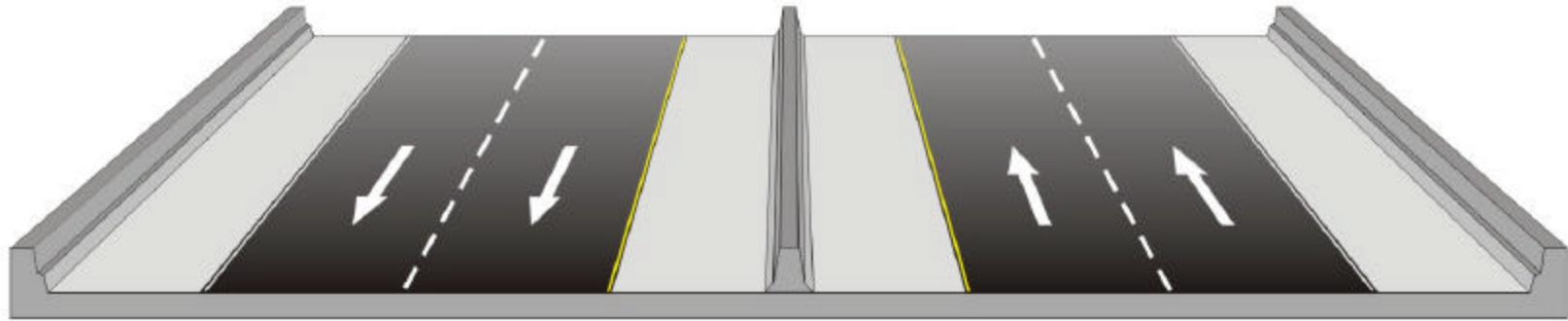
The existing roadway typical section along Gandy Boulevard (SR 694) from west of US 19 to east of US 19 varies. As shown in Figure 2-1, west of US 19, Gandy Boulevard (SR 694) is a divided six-lane roadway with curb and gutter on both sides of the roadway. This section contains three 12 foot (ft.) travel lanes in each direction and a raised median varying in width between 16 ft. and 18 ft. This section has 6 ft. sidewalks along the right-of-way (ROW). The existing ROW width varies between 102 ft. and 142 ft.

As shown in Figure 2-2, the Gandy Boulevard (SR 694) bridge section over US 19 consists of two 12 ft. travel lanes in each direction with a 7 ft. inside shoulder and a 7 ft. outside shoulder.

As shown in Figure 2-3, the east and west approaches to US 19 along Gandy Boulevard (SR 694) consist of two 12 ft. travel lanes in each direction with inside paved shoulders and a concrete barrier wall in the median and outside paved shoulders with shoulder gutter and guardrail. The exit/entrance ramps are 15 ft. wide with curb and gutter. The existing ROW width varies between 142 ft. and 340 ft.

2-3





GANDY BOULEVARD BRIDGE
over US 19
BRIDGE No: 150125
SEGMENT A



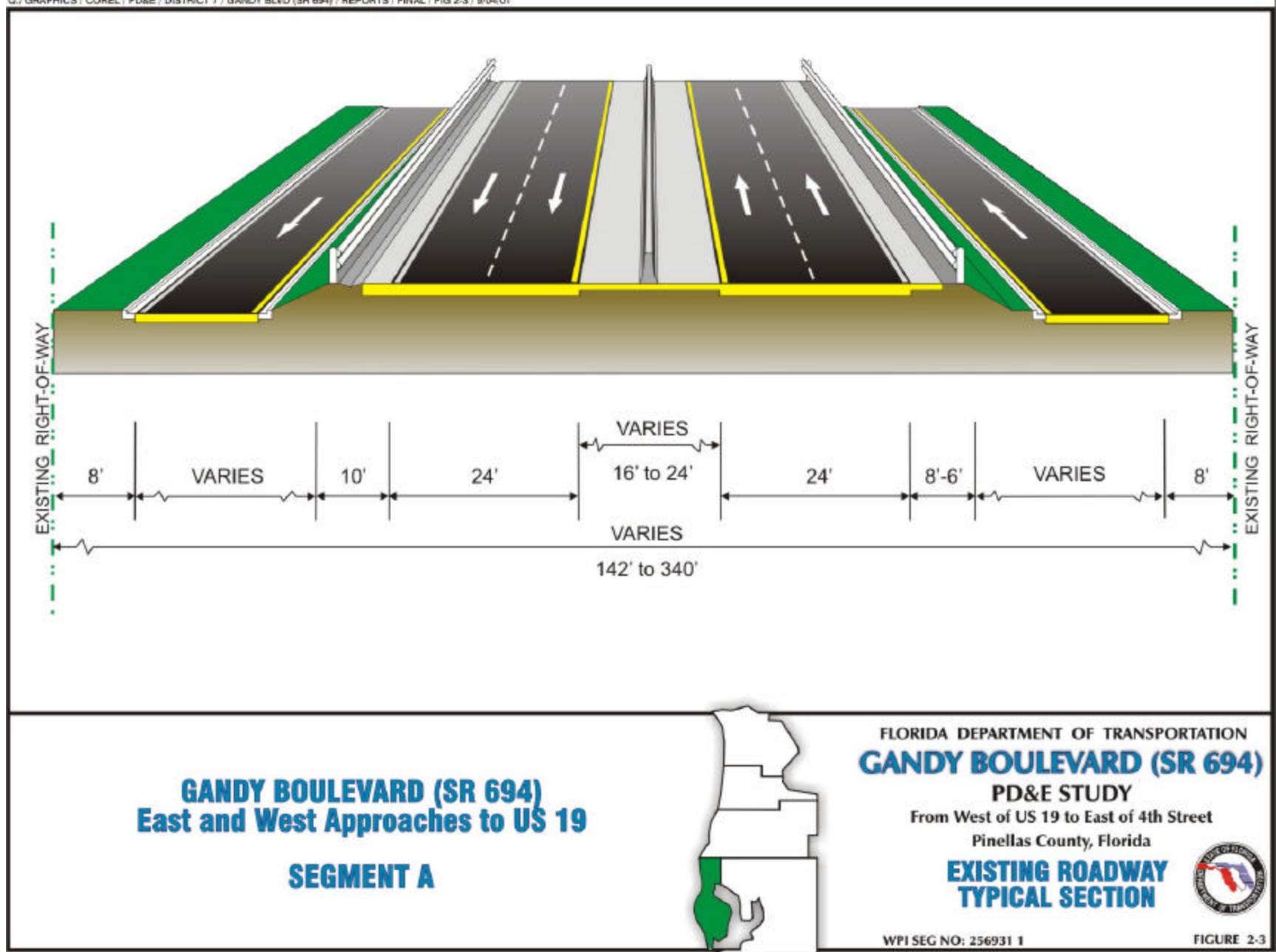
FLORIDA DEPARTMENT OF TRANSPORTATION
GANDY BOULEVARD (SR 694)
 PD&E STUDY
 From West of US 19 to East of 4th Street
 Pinellas County, Florida
EXISTING ROADWAY
TYPICAL SECTION



WPI SEG NO: 256931 1

FIGURE 2-2

2-5



As shown in Figure 2-4, the existing typical section along Gandy Boulevard (SR 694) from east of US 19 to I-275 is a divided six-lane roadway with open drainage ditches on both sides of the roadway. This segment also contains two-way two-lane frontage roads on the north and south side of Gandy Boulevard (SR 694) between Grand Avenue and west of I-275 and will necessitate analyzing different proposed typical sections during this PD&E Study. This section contains three 12 ft. travel lanes in each direction and a depressed median varying in width from 24 ft. to 60 ft. The outside travel lanes in each direction serve as auxiliary lanes between US 19 on the west side and I-275 on the east side. The outside eastbound lane is added at US 19 and dropped at I-275. The outside westbound lane is added at I-275 and dropped at US 19. The existing ROW width varies between 160 ft. to 380 ft.

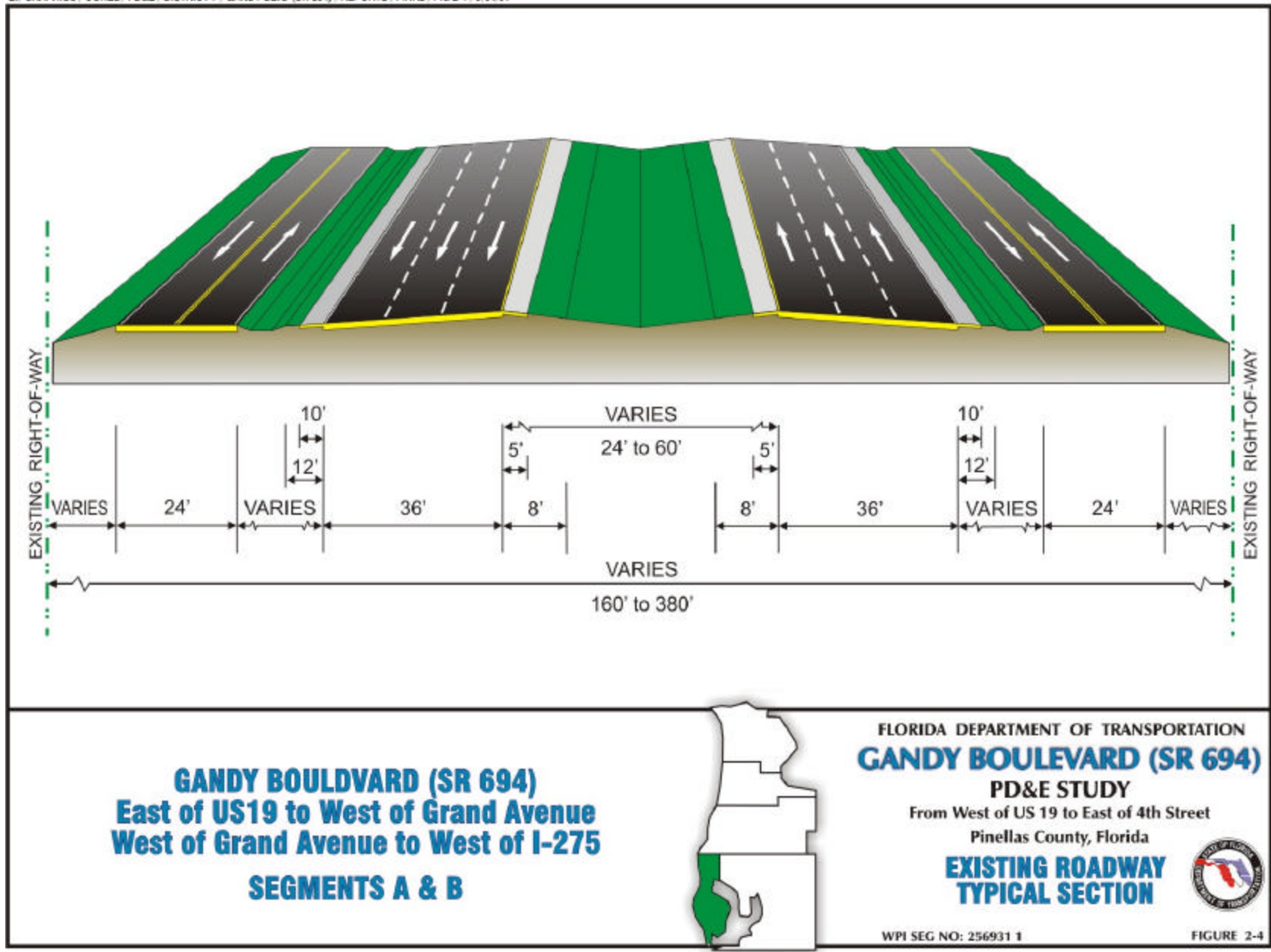
The existing land use in this section is generally a mix between residential and commercial. The Average Annual Daily Traffic (AADT) for these segments ranges from 51,300 vehicles per day (vpd) to 53,200 vpd. The existing posted speed in this segment varies between 45 mph and 50 mph.

2.1.2 Segment B

As shown in Figure 2-4, the existing typical section along Gandy Boulevard (SR 694) from west of Grand Avenue to west of I-275 is a divided six-lane roadway with open drainage ditches on both sides of the roadway. This section contains three 12 ft. travel lanes in each direction and a depressed median that varies between 24 ft. and 60 ft. This segment also contains sections of two-way two-lane frontage roads on the north and south side of Gandy Boulevard (SR 694) between Grand Avenue and west of I-275. The existing ROW width varies between 160 ft. and 380 ft.

The existing land use in this section is generally a mix between residential and commercial. The AADT for this segment ranges from 53,200 vpd to 60,300 vpd. The existing posted speed in this segment is 50 mph.

2-7



2.1.3 Segment C

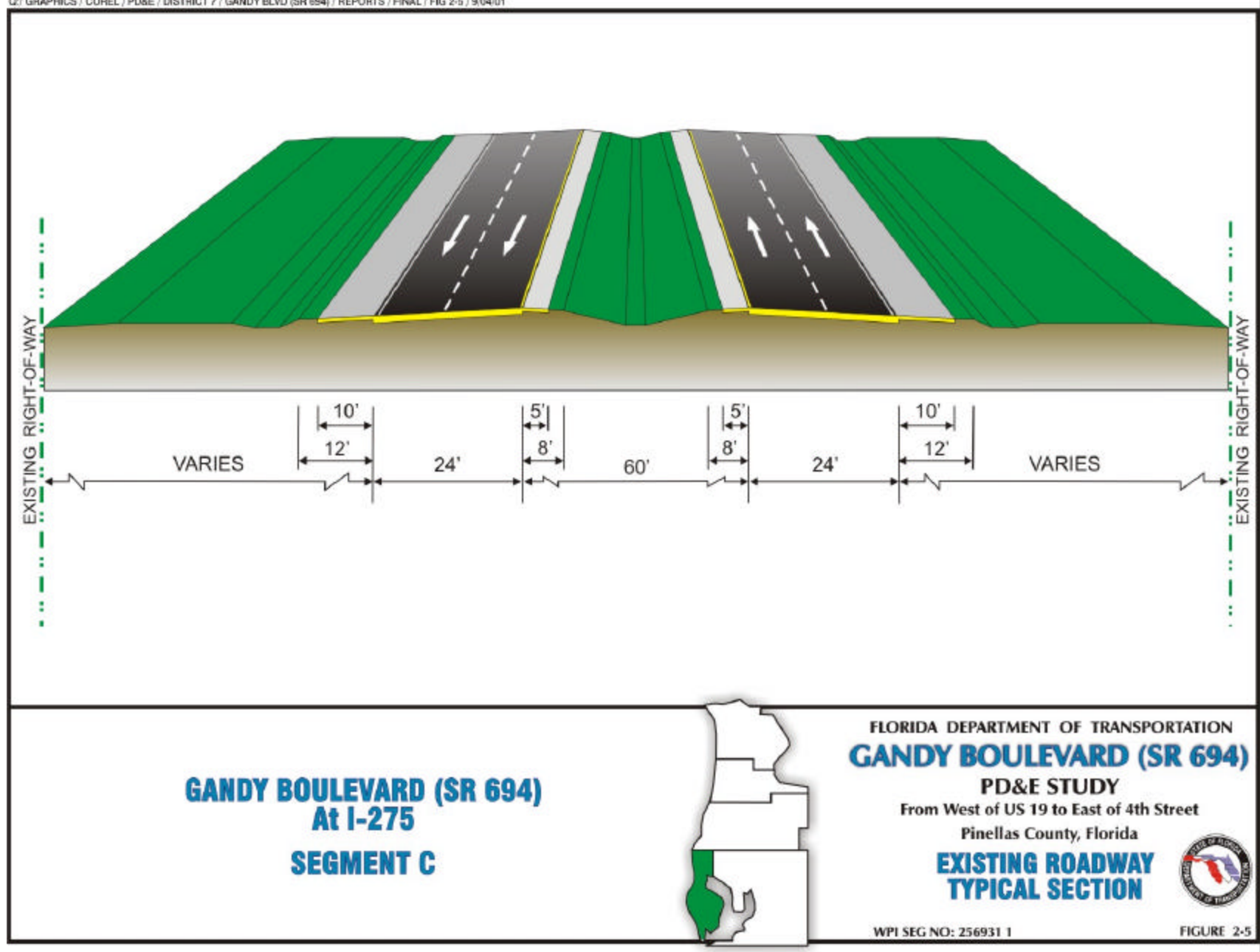
As shown in Figure 2-5, the existing typical section along Gandy Boulevard (SR 694) from I-275 to 9th Street is a divided four-lane roadway. This segment also contains sections of two-way two-lane frontage roads on the north and south side of Gandy Boulevard (SR 694) between east of I-275 and 9th Street as shown in Figure 2-6. This existing section has open drainage ditches on both sides of the roadway. Gandy Boulevard (SR 694) contains two 12 ft. travel lanes in each direction with a depressed median varying in width between 60 ft. and 92 ft. This section of Gandy Boulevard (SR 694) also contains a 10' paved outside shoulder, and drainage swales in the median. The existing ROW width varies between 420 ft. and 550 ft.

The existing land use in this section is generally a mix between residential and commercial. In addition, The City of St. Petersburg is currently designing improvements to portions of the existing four-lane section by widening within the existing median, adding one lane in each direction from 28th Street to 9th Street. The AADT for this segment ranges from 47,200 vpd to 60,300 vpd. The existing posted speed in this segment is 50 mph.

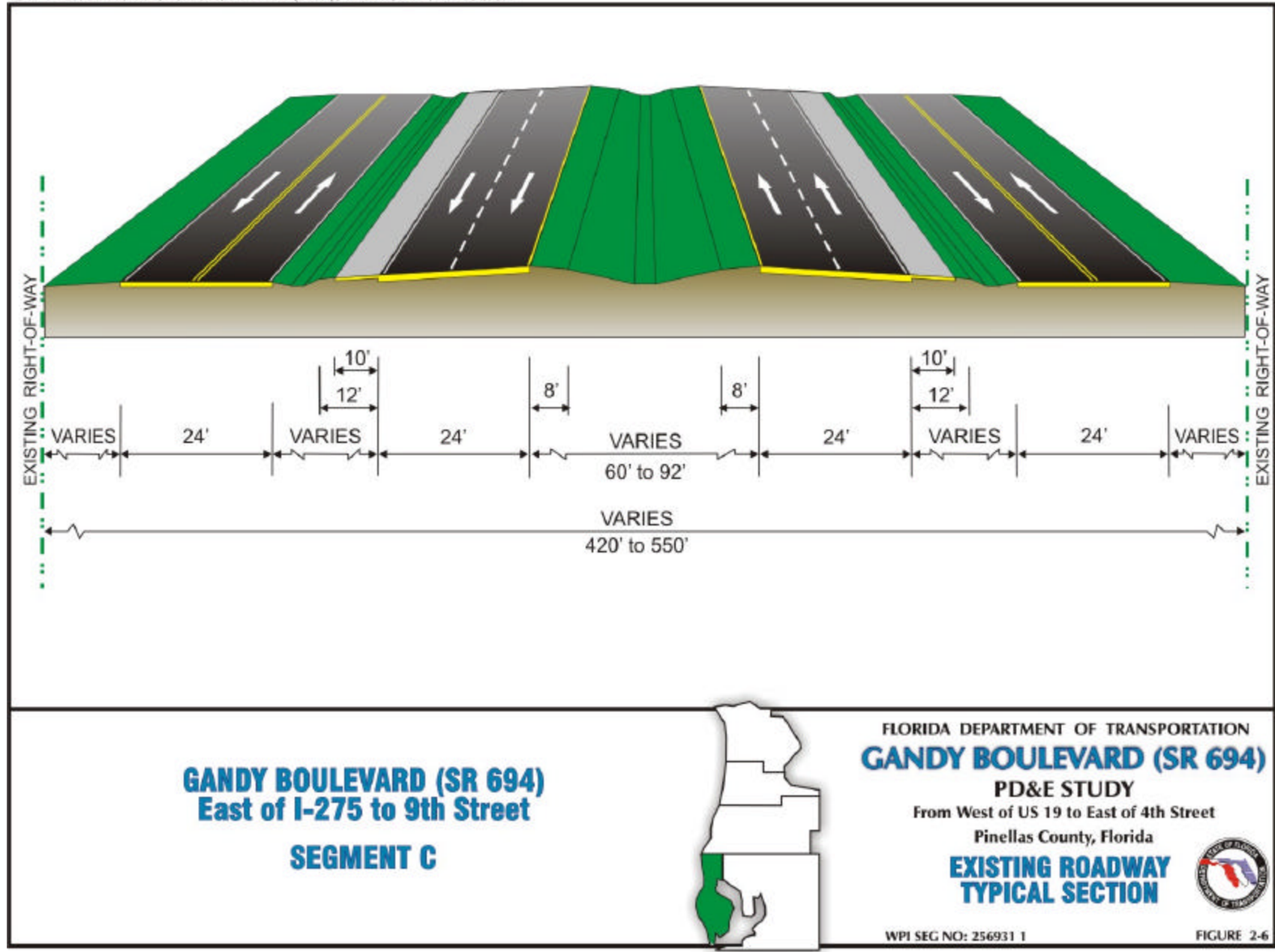
2.1.4 Segment D

As shown in Figure 2-7, the existing typical section along Gandy Boulevard (SR 694) from 9th Street to east of 4th Street is a divided four-lane roadway. This existing section has open drainage ditches on both sides of the roadway. Gandy Boulevard (SR 694) contains two 12 ft. travel lanes in each direction with a depressed median that varies in width between 36 ft. and 275 ft. This section of Gandy Boulevard (SR 694) also contains swales in the median. The existing ROW width varies between 220 ft. and 520 ft.

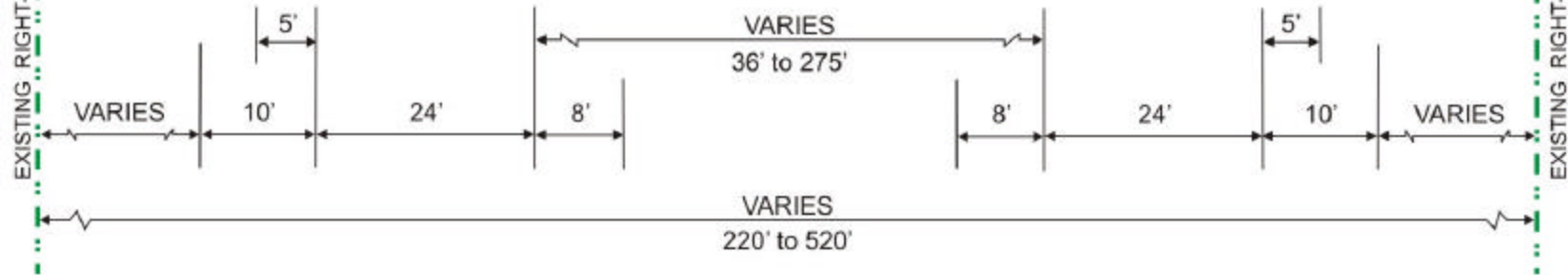
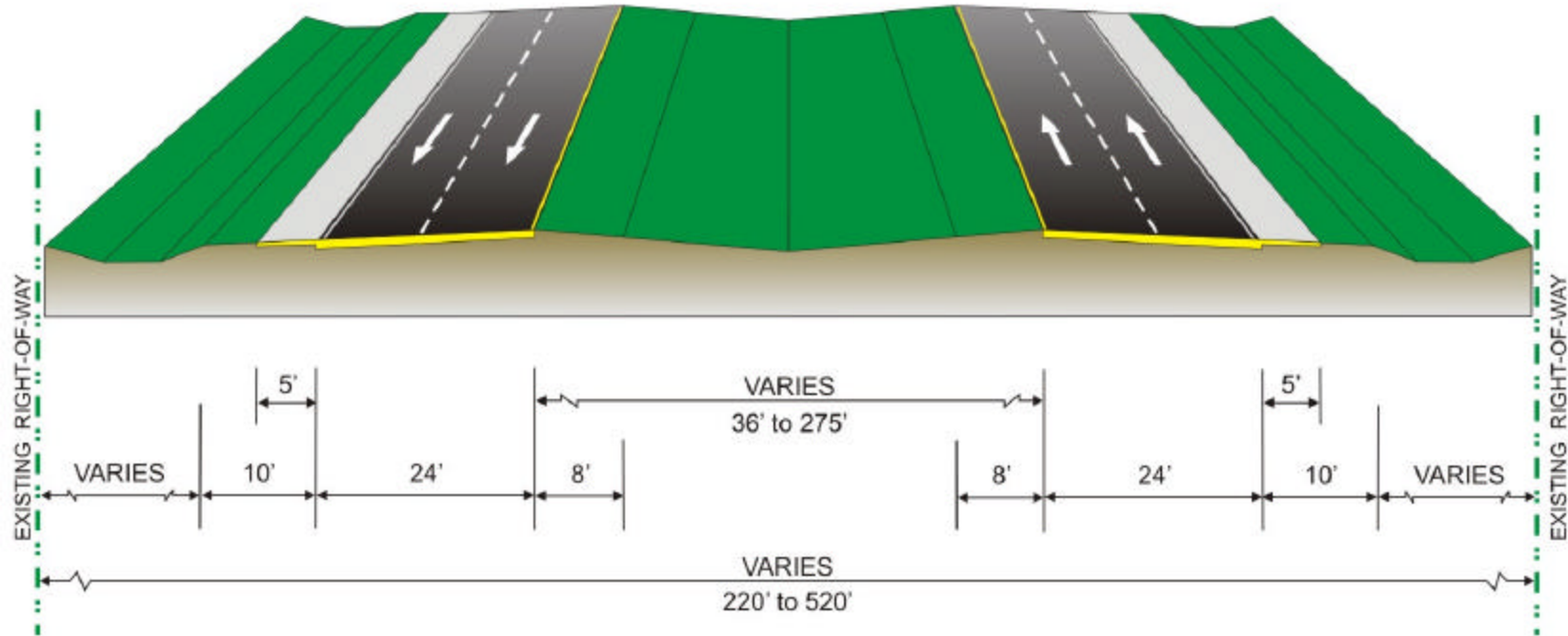
2-9



2-10



2-11



GANDY BOULEVARD (SR 694)
9th Street to East of 4th Street
SEGMENT D



FLORIDA DEPARTMENT OF TRANSPORTATION
GANDY BOULEVARD (SR 694)
 PD&E STUDY
 From West of US 19 to East of 4th Street
 Pinellas County, Florida
EXISTING ROADWAY
TYPICAL SECTION



WPI SEG NO: 256931 1

FIGURE 2-7

The existing land use in this section is generally a mix between residential and commercial. The AADT for this segment ranges from 25,400 vpd to 34,100 vpd. The existing posted speed in this segment is 50 mph.

2.2 EXISTING CROSS ROAD TYPICAL SECTIONS

The Traffic Report Technical Memorandum¹ projects that the existing interchange at US 19 remains sufficient for design year 2020 traffic. The Traffic Report Technical Memorandum¹ projects that overpasses are needed at Grand Avenue and 16th Street. The Traffic Report Technical Memorandum¹ also projects that a split diamond interchange is needed by the design year 2020 for the intersections of 9th Street and 4th Street while Roosevelt Boulevard remains as an at-grade intersection. Finally, the Traffic Report Technical Memorandum¹ projects that a flyover is needed for the northbound I-275 to westbound Gandy Boulevard (SR 694) movement.

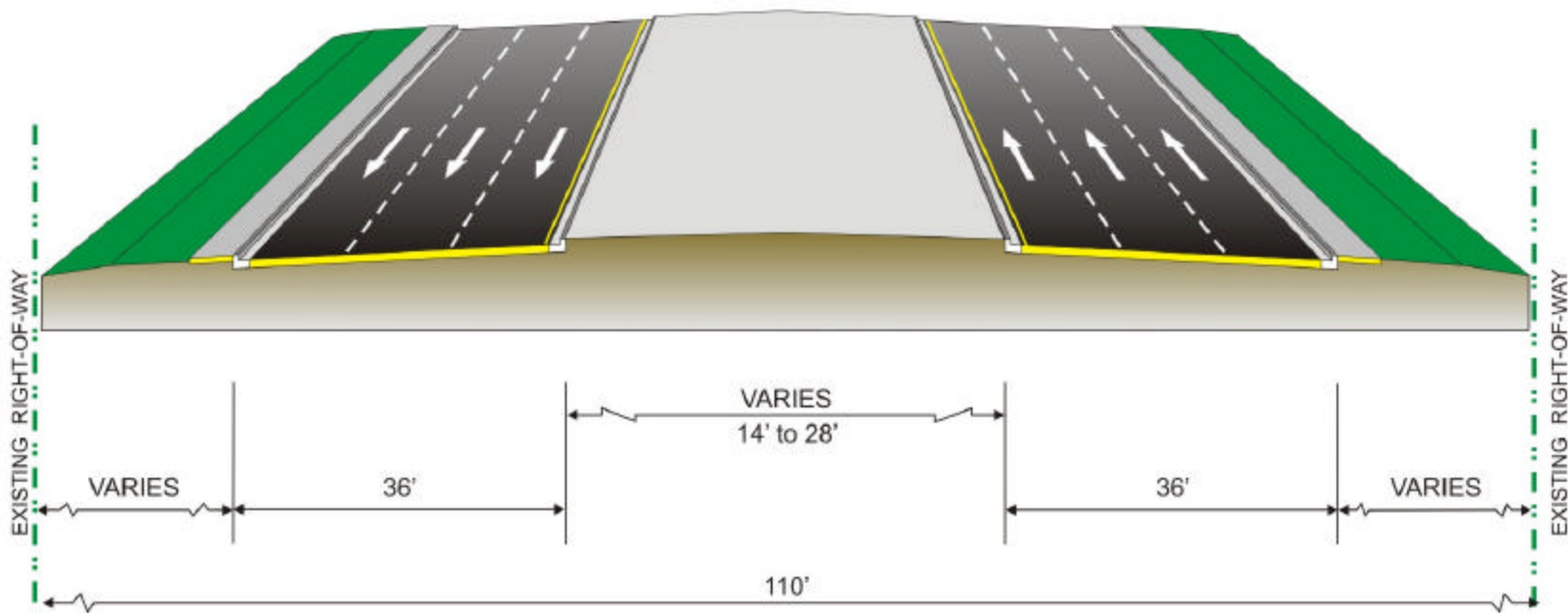
2.2.1 US 19

As shown in Figure 2-8, the existing typical section along US 19 both north and south of Gandy Boulevard (SR 694) is a divided six-lane roadway with curb and gutter on both sides of the roadway. This section contains three 12 ft. travel lanes in each direction. This section of US 19 currently traverses under a four-lane bridge for Gandy Boulevard (SR 694). Access to eastbound and westbound Gandy Boulevard (SR 694) is via signalized on-ramps and off-ramps. The existing ROW width is typically 110 ft. The existing land use for this section is a mix between residential and commercial.

2.2.2 Grand Avenue

As shown in Figure 2-9, the existing typical section along Grand Avenue north of Gandy Boulevard (SR 694) is a divided four-lane urban roadway. This section contains two 12 ft.

2-13



**US 19
at Gandy Boulevard (SR 694)
SIX-LANE DIVIDED URBAN**



FLORIDA DEPARTMENT OF TRANSPORTATION
GANDY BOULEVARD (SR 694)

PD&E STUDY
From West of US 19 to East of 4th Street
Pinellas County, Florida

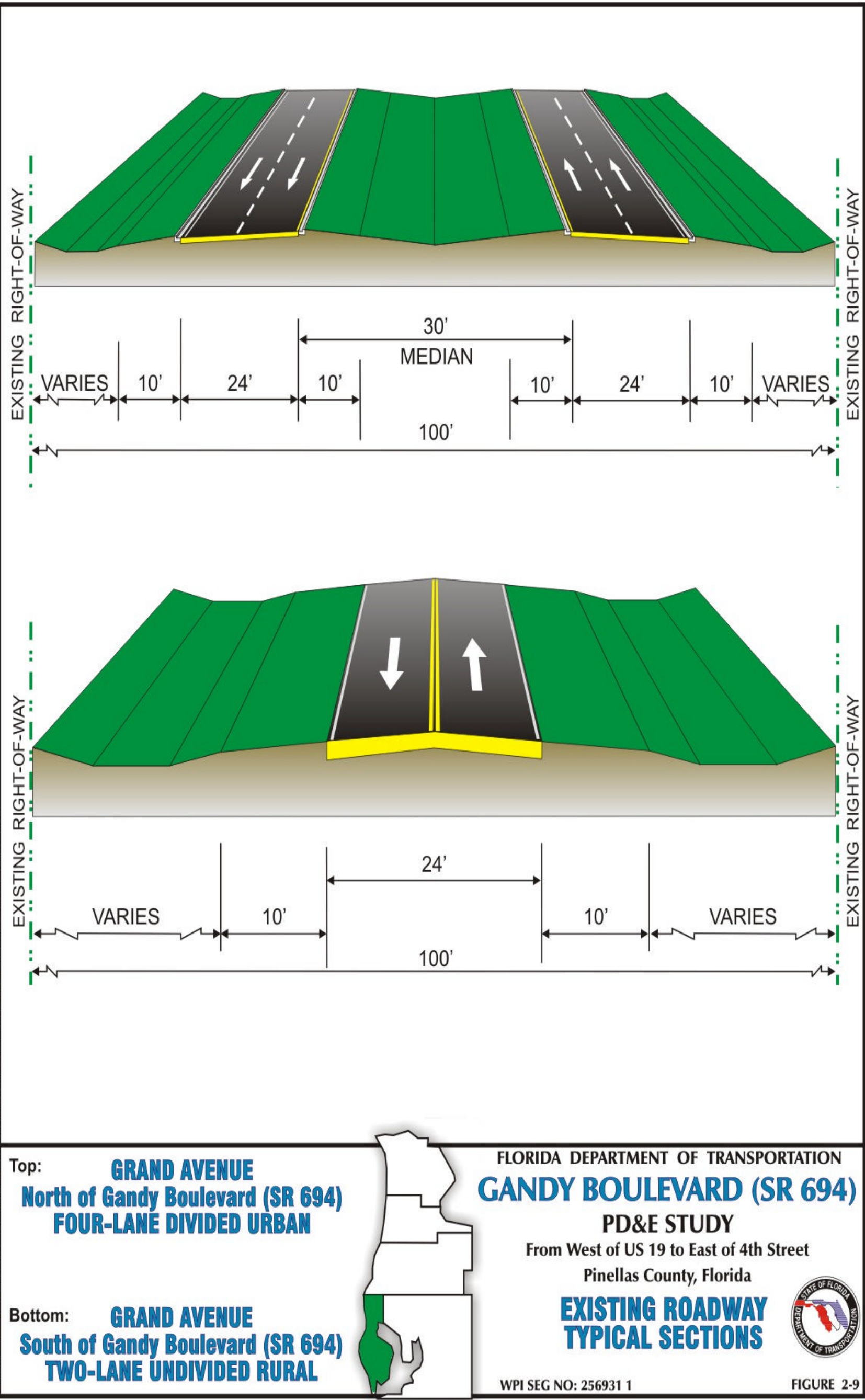
**EXISTING ROADWAY
TYPICAL SECTION**



WPI SEG NO: 256931 1

FIGURE 2-8

Q:\GRAPHICS\COREL\PD&E\DISTRICT 7\GANDY BLVD (SR 694)\REPORTS\FINAL\FIG 2-9.CDR / 9/04/01



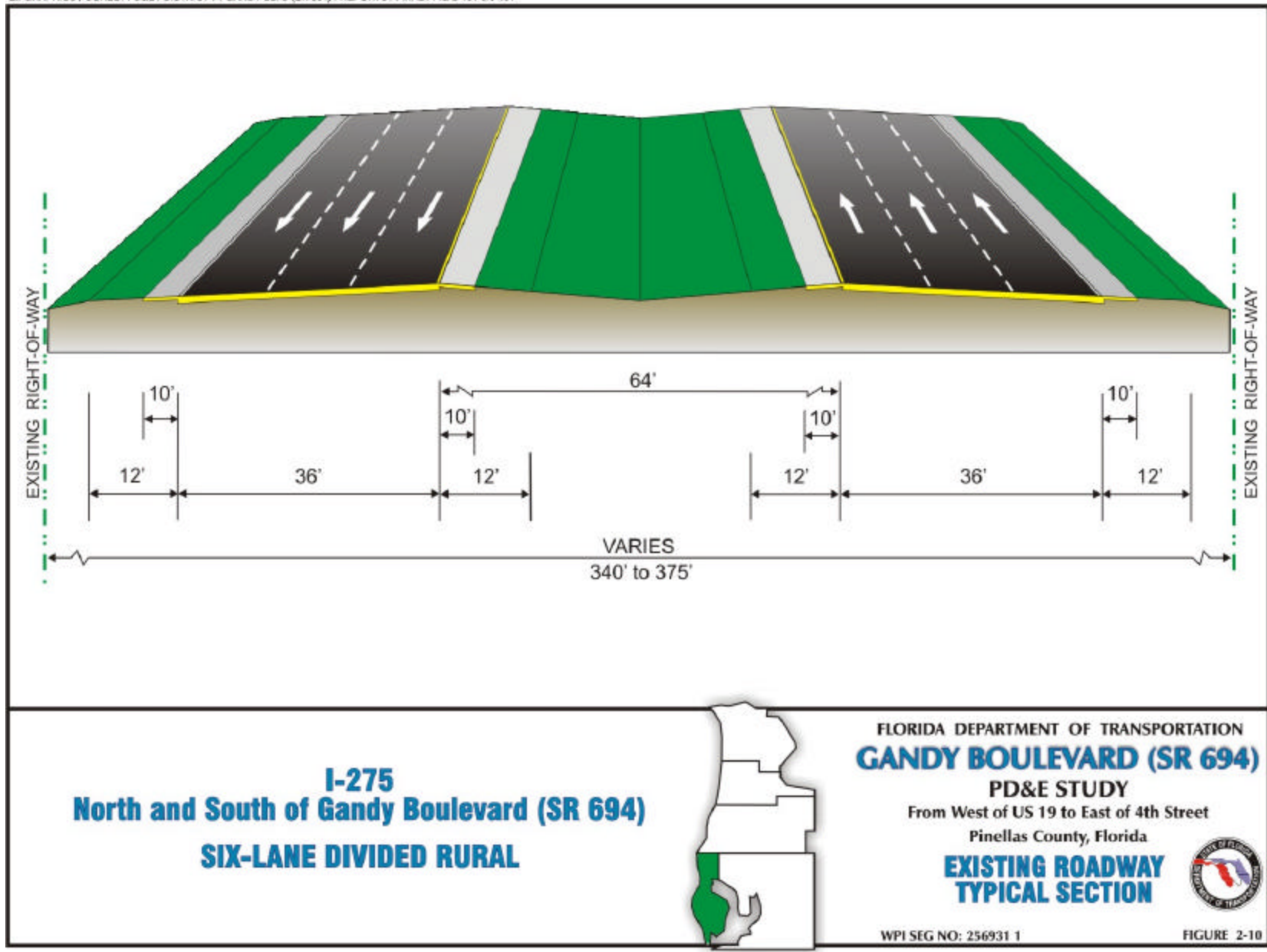
travel lanes in each direction with a depressed median. The existing ROW width is approximately 100 ft. The existing land use for this section on the north side of Gandy Boulevard (SR 694) is commercial. The existing typical section along Grand Avenue south of Gandy Boulevard (SR 694) is an undivided two-lane roadway with 10 ft. of unpaved shoulders on both sides of the roadway. This section contains one 12 ft. travel lane in each direction. The existing ROW width is typically 100 ft. The existing land use in this section on the south side of Gandy Boulevard (SR 694) is generally a mix between residential and commercial.

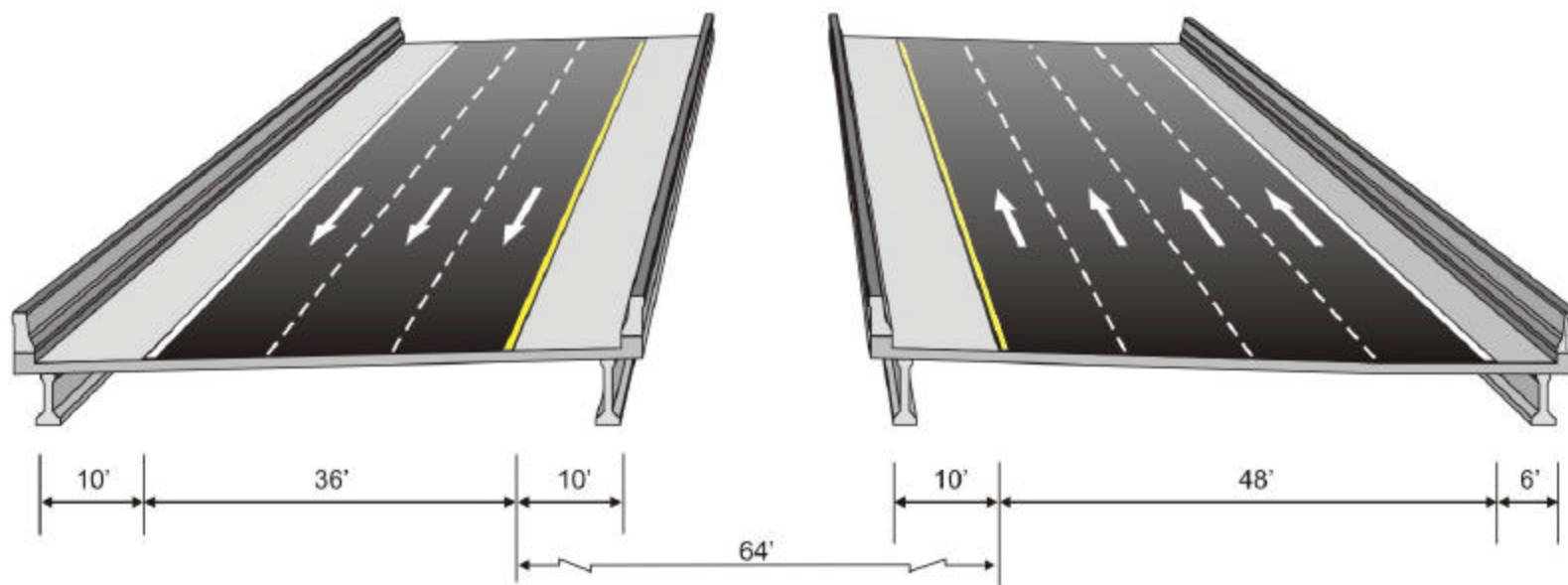
2.2.3 I-275

The existing typical section along I-275 north and south of Gandy Boulevard (SR 694) and over Gandy Boulevard (SR 694) is a six-lane divided roadway, a divided bridge section and a ramp flyover as shown in Figures 2-10, 2-11, and 2-12 respectively. The roadway section contains three 12 ft. travel lanes in each direction and a 64 ft. depressed median. This section has 12 ft. inside and outside shoulders with 10 ft. paved and drainage swales in the median. As shown in Figure 2-11, the southbound bridge section contains three 12 ft. travel lanes with a 10 ft. inside shoulder and a 10 ft. outside shoulder. The northbound bridge section contains four 12 ft. travel lanes with a 10 ft. inside shoulder and a 6 ft. outside shoulder. The interchange currently does not provide access from I-275 south to Gandy Boulevard (SR 694) east and Gandy Boulevard (SR 694) west to I-275 north. As shown in Figure 2-12, the existing flyover Ramp B over Gandy Boulevard (SR 694) consists of two 12 ft. travel lanes with a 6 ft. inside shoulder and a 10 ft. outside shoulder. The existing ROW width along I-275 varies between 340 ft. and 375 ft. The existing land use for this section is generally a mix between residential and commercial.

2.2.4 9th Street

The existing typical section along 9th Street consists of a four-lane divided rural roadway as shown in Figure 2-13. This section contains two 12 ft. travel lanes in each direction and a





**EXISTING I-275 BRIDGES
over Gandy Boulevard (SR 694)**

**Northbound Bridge No: 150101
Southbound Bridge No: 150100**



FLORIDA DEPARTMENT OF TRANSPORTATION
GANDY BOULEVARD (SR 694)

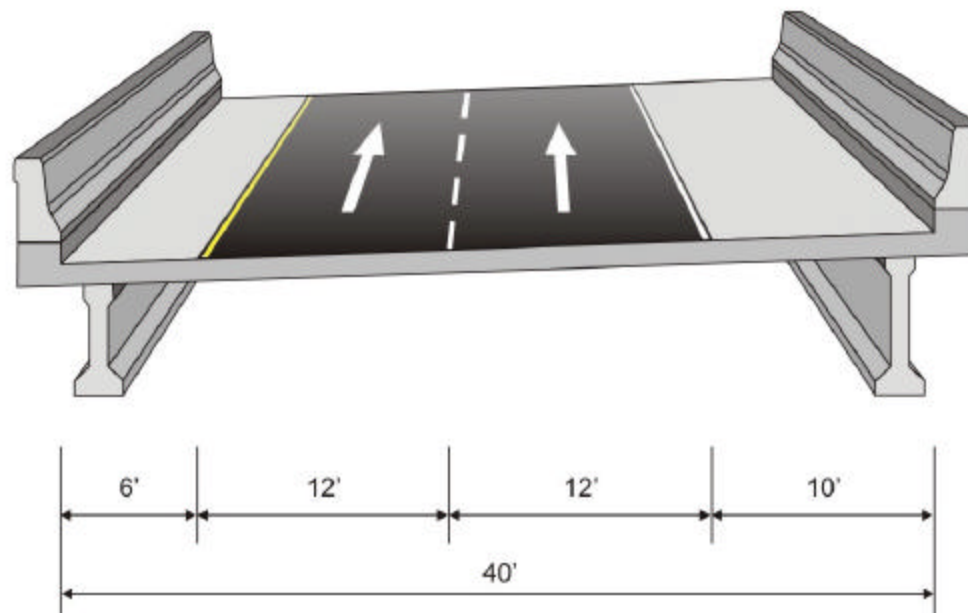
PD&E STUDY
From West of US 19 to East of 4th Street
Pinellas County, Florida

**EXISTING BRIDGE
TYPICAL SECTION**



WPI SEG NO: 256931 1

FIGURE 2-11



STRUCTURE "B" ON RAMP "B"
over Gandy Boulevard (SR 694)
Westbound Gandy to I-275 Northbound
Bridge No: 150109

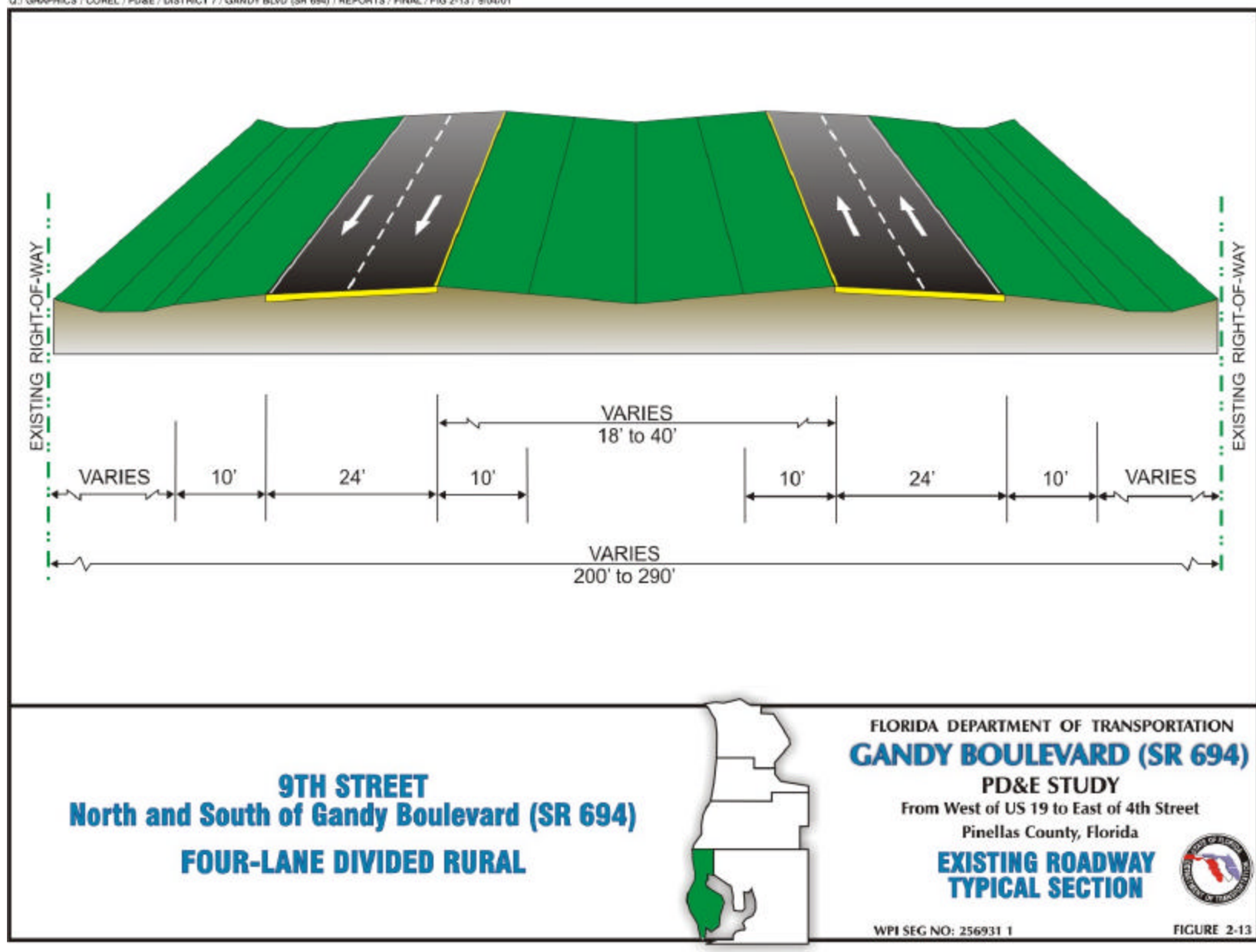


FLORIDA DEPARTMENT OF TRANSPORTATION
GANDY BOULEVARD (SR 694)
 PD&E STUDY
 From West of US 19 to East of 4th Street
 Pinellas County, Florida
EXISTING ROADWAY
TYPICAL SECTION



WPI SEG NO: 256931 1

FIGURE 2-12



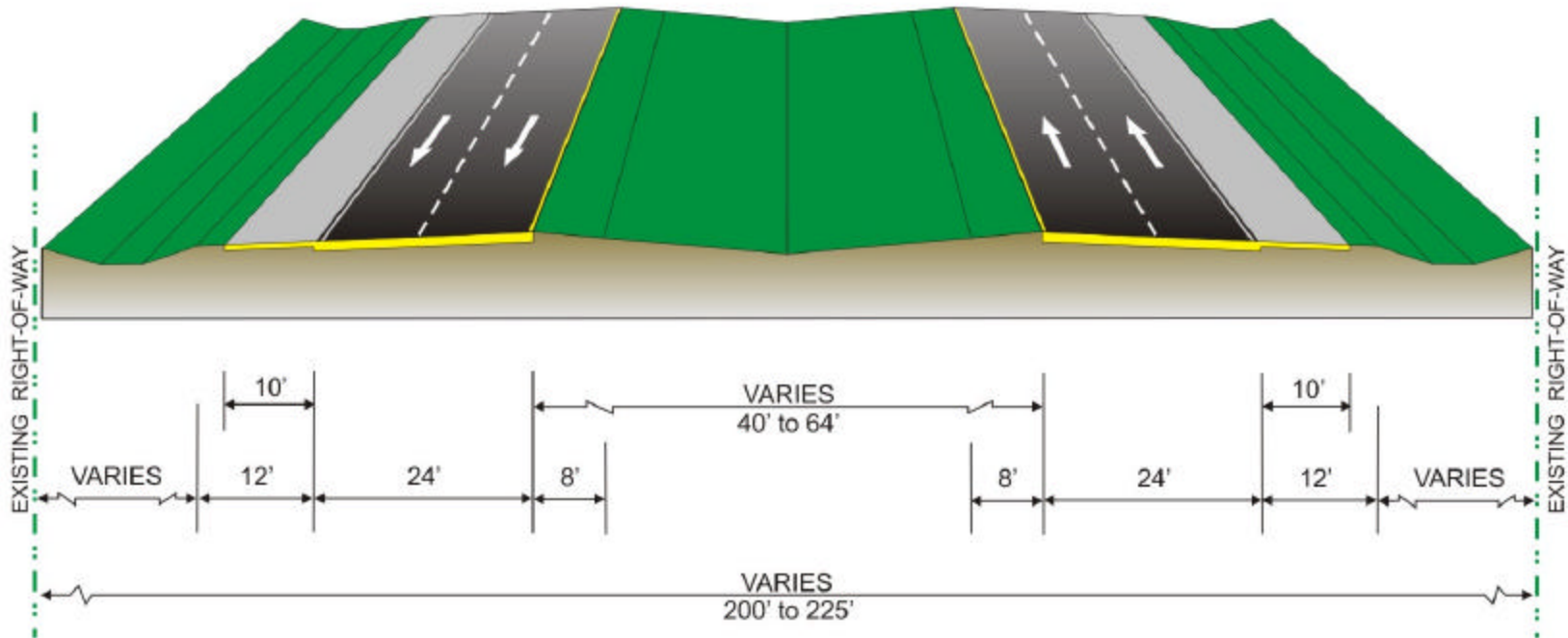
depressed median varying in width between 18 ft. and 40 ft. The existing ROW width varies between 200 ft. and 290 ft. The existing land use in this section is generally a mix between residential and commercial.

2.2.5 Roosevelt Boulevard

The existing typical section along Roosevelt Boulevard between Gandy Boulevard (SR 694) and 9th Street consists of a four-lane divided rural roadway section as shown in Figure 2-14. This section contains two 12 ft. travel lanes in each direction and a depressed median varying in width between 40 ft. and 64 ft. This section has an 8 ft. inside shoulder and a 12 ft. outside shoulder with 10 ft. of the outside shoulder paved. The existing ROW width varies between 200 ft. and 225 ft. The existing land use in this section is generally a mix between residential and commercial.

2.2.6 4th Street

The existing typical section along 4th Street consists of a six-lane divided urban roadway as shown in Figure 2-15. This section contains three 12 ft. travel lanes in each direction and a depressed median varying in width between 18 ft. and 40 ft. This section has curb and gutter with sections of sidewalk. The existing ROW width varies between 98 ft. and 152 ft. The existing land use in this section is generally a mix between residential and commercial.

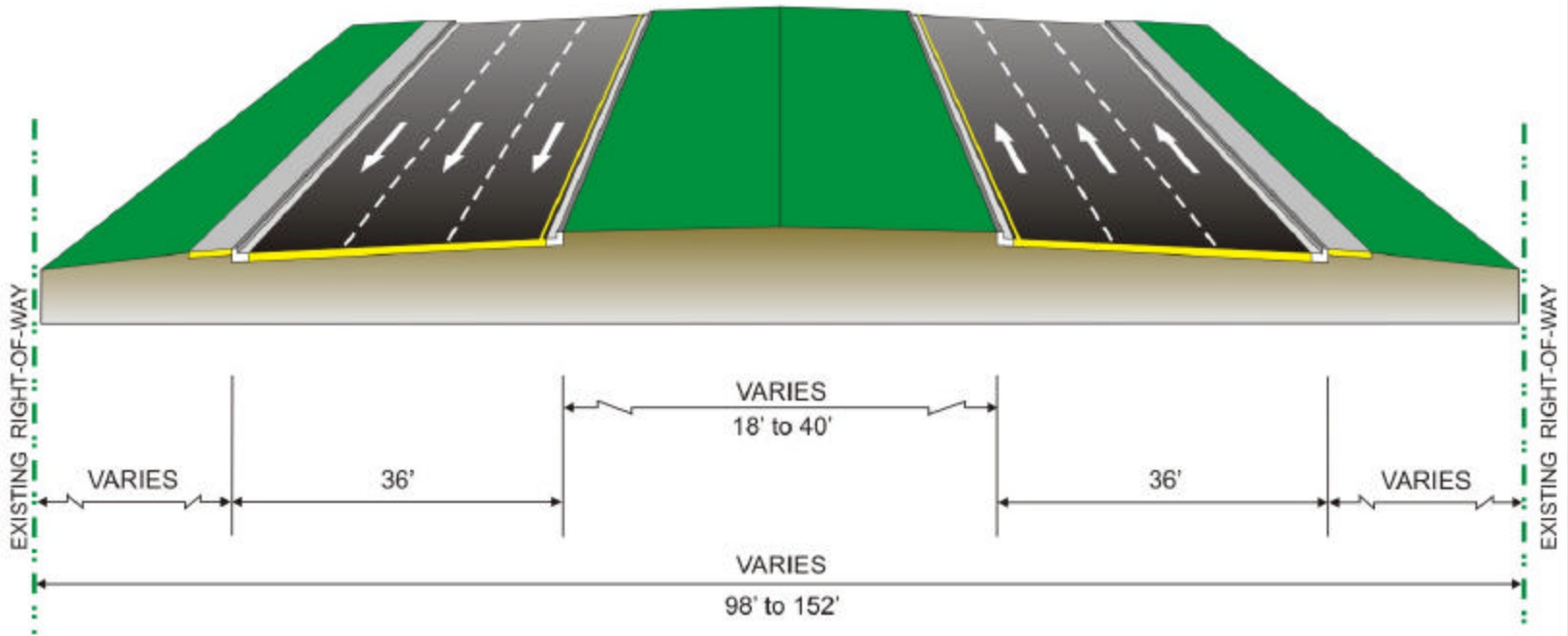


ROOSEVELT BOULEVARD (SR 686)
Gandy Boulevard (SR 694) to 9th Street
FOUR-LANE DIVIDED RURAL



FLORIDA DEPARTMENT OF TRANSPORTATION
GANDY BOULEVARD (SR 694)
PD&E STUDY
 From West of US 19 to East of 4th Street
 Pinellas County, Florida
EXISTING ROADWAY
TYPICAL SECTION





4TH STREET
North and South of Gandy Boulevard (694)
SIX-LANE DIVIDED URBAN



FLORIDA DEPARTMENT OF TRANSPORTATION
GANDY BOULEVARD (SR 694)
 PD&E STUDY
 From West of US 19 to East of 4th Street
 Pinellas County, Florida
EXISTING ROADWAY
TYPICAL SECTION



WPI SEG NO: 256931 1

FIGURE 2-15

2.3 REFERENCES

1. Traffic Report Technical Memorandum; Gannett Fleming, Inc. for the Florida Department of Transportation, District 7; February 2001.

SECTION 3

TYPICAL SECTION DESIGN CRITERIA

In order for the proposed roadway improvements to fulfill their objective of accommodating motorized vehicles, and where appropriate, pedestrians and bicyclists in a safe and efficient manner, the proposed typical sections must adhere to specific design standards. The FDOT's Plans Preparation Manual (PPM)¹, AASHTO – a Policy on Geometric Design of Highway Streets², and the District Seven Straight Line Diagram (SLD) was used as the reference for development of proposed typical section design criteria for this project. Table 3-1 presents the pertinent criteria used for this effort and their respective values or designations. A discussion of each criterion follows below.

3.1 FUNCTIONAL CLASSIFICATION

The functional classification of a roadway affects elements of design such as design speed, Level of Service (LOS) requirements, and local access accommodations. According to the FDOT SLD, Gandy Boulevard (SR 694), SR 55 (US 19), SR 93 (I-275), and SR 687 (4th Street) are classified as urban principal arterials and SR 686 (Roosevelt Boulevard) is classified as an urban minor arterial. According to the Pinellas County Comprehensive Plan³, 9th Street is classified as a minor arterial. Gandy Boulevard (SR 694) is included in the Florida Intrastate Highway System as a controlled access facility.

3.2 DESIGN SPEED

The design speed affects design elements such as horizontal and vertical alignments, superelevation, and typical section dimensions (clear zone, median width, etc.). The assumed design speed should be logical with respect to factors such as topography, adjacent land use, and the functional classification of the highway. As indicated in AASHTO-A Policy on Geometric Design of Highways and Streets³, the design speed control applies to a lesser degree on arterial streets than

on other type of facilities such as rural highways since

Table 3-1
Typical Section Design Criteria

Criteria	Value/Designation	Documentation
Functional Classification: Gandy Boulevard (SR 694) Frontage Road SR 55 (US 19) SR 93 (I-275) 9 th Street North SR 686 (Roosevelt Boulevard) SR 687 (4 th Street)	Urban Principal Arterial Collector Urban Principal Arterial Urban Principal Arterial-Interstate Minor Arterial Urban Minor Arterial Urban Principal Arterial	FDOT Straight Line Diagram Pinellas County Comprehensive Plan FDOT Straight Line Diagram FDOT Straight Line Diagram Pinellas County Comprehensive Plan FDOT Straight Line Diagram FDOT Straight Line Diagram
Design Speed: Gandy Boulevard (SR 694) Frontage Road SR 55 (US 19) SR 93 (I-275) 9 th Street North SR 686 (Roosevelt Boulevard) SR 687 (4 th Street) Ramps Collector Roads	50 mph 45 mph 50 mph 70 mph 50 mph 50 mph 50 mph 50 mph 50 mph	FDOT PPM Section 1.9 Tables 1.9.1 & 1.9.2
Lane Width: (Gandy) Mainline Travel Lane Frontage Road Single Lane Ramp Two Lane Ramp Bicycle Lane	12.0 ft. 12.0 ft. 15.0 ft. 24.0 ft. 4.0 ft.	FDOT PPM Table 2.1.1, 2.1.2, & 2.1.3
Median Width: (Gandy) Roadway Roadway with Median Barrier	40.0 ft. 26.0 ft. (Minimum)	FDOT PPM Table 2.2.1
Roadway Shoulder Width: (Gandy) Roadway Outside Median or Left. Frontage Road Outside Median or Left. Ramp (Single Lane) Inside Outside Ramp (Two Lane) Inside Outside	12.0 ft. total with 5.0 ft. paved 12.0 ft. total with 0.0 ft. paved 12.0 ft. total with 5.0 ft. paved 8.0 ft. total with 0.0 ft. paved 6.0 ft. total with 2.0 ft. paved 6.0 ft. total with 5.0 ft. paved 6.0 ft. total with 2.0 ft. paved 10.0 ft. total with 5.0 ft. paved	FDOT PPM Table 2.3.2 (Based on high volume roadway) FDOT PPM Table 2.3.4 FDOT PPM Table 2.3.2 FDOT PPM Table 2.3.2

Criteria	Value/Designation	Documentation
Sidewalk Width: (Gandy) Standard Adjacent to Curb/Gutter	5.0 ft. 6.0 ft.	FDOT PPM Section 8.3.1
Border Width: (Gandy) Travel Lane at Curb Bike Lane or Auxiliary Lane at Curb Flush Shoulder Freeways and Interchange Ramp s	14.0 ft. 12.0 ft. 40.0 ft. (Design Speed > 45 mph) 33.0 ft. (Design Speed ≤ 45 mph) 82.0 ft.	FDOT PPM Table 2.5.2 Table 2.5.1 Table 2.5.1 Table 2.5.1

the top speeds for several hours a day on arterial streets are limited or regulated to that which the recurring peak volumes can be handled. Speeds along these types of roadways are governed by the presence of other vehicles traveling in groups both in and across the through lanes. The speeds are also governed by traffic devices rather than by the physical characteristics of the street. During periods of low to moderate traffic volumes, speeds are governed by such factors as speed limits, intersectional frictions, and mid-block frictions such as a high density of driveways.

Within the project limits, the Gandy Boulevard (SR 694) corridor is generally a rural and residential area with a small percentage of commercial and office uses. The area is sparsely developed with major generators including the Roberts Mobile Home/RV Center, Lauren Manor Condos, Gateway Center, First Baptist Church of St. Petersburg, Gateway Mobile Park, and a large number of apartments and condominiums. There is a substantial amount of vacant land available for future development. Redevelopment is anticipated in areas of strip malls with an intensification of uses anticipated. The Pinellas County Comprehensive Plan³ designates Gandy Boulevard (SR 694) as a hurricane evacuation route. In several locations there are also several businesses congregated together on small lots each with their own driveway access.

As indicated in the Traffic Report Technical Memorandum⁴, a six-lane facility at a minimum will be needed along Gandy Boulevard (SR 694) to achieve a LOS D based on the design year (2020) traffic analysis. Although Gandy Boulevard (SR 694) may be reconstructed to a six-lane facility

throughout the project limits as recommended, it is anticipated that the increasing traffic volumes and the expected future redevelopment will serve to further urbanize this environment which will influence the operating speed of Gandy Boulevard (SR 694). The existing posted speed limit on Gandy Boulevard (SR 694) ranges between 45 and 50 mph throughout the project limits. Field observations indicate that the posted speed appears to be on the high end of the operating speed during much of the day. This is due primarily to the high traffic volume combined with the existing urban conditions and frequent traffic control devices. It is based on these factors that a proposed design speed of 50 mph has been selected for this project along Gandy Boulevard (SR 694). This design speed is in conformance with the FDOT PPM¹ for an urban arterial FIHS highway. A design speed of 50 mph has also been selected for this project along the cross roads where proposed new interchanges will be located. This design speed selection is based on the same justification as for the Gandy Boulevard (SR 694) corridor and conforms to the FDOT PPM¹ for an urban arterial type highway. A design speed of 45 mph has been selected for proposed frontage roads. A design speed of 50 mph has been selected for proposed ramps.

3.3 LANE WIDTHS

According to the FDOT PPM¹, Table 2.1.1, travel lanes widths for an urban arterial facility should be 12 ft.

For interchange ramps, FDOT PPM Table 2.1.3 states that the standard width of a one-lane ramp should be 15 ft. and the standard width for a two-lane ramp should be 24 ft.

3.4 BIKE LANES

As indicated in the FDOT PPM¹, Section 8.4, a bike lane is an important element for consideration in the highway design process. A bike lane can be designated or undesignated. In the FDOT PPM¹, Table 2.1.2 lists the minimum width of a bike lane for an urban arterial to be 4 ft.

3.5 MEDIAN WIDTHS

According to the FDOT PPM¹, Table 2.2.1, the desirable raised median width for an arterial facility is 22 ft. This median width will also apply to the cross roads where interchanges will be needed by the design year 2020 at 9th Street, Roosevelt Boulevard, and 4th Street and where overpasses are needed at Grand Avenue and 16th Street.

3.6 SHOULDER WIDTHS

According to the FDOT PPM¹, Table 2.3.2, the minimum shoulder width for a divided six-lane arterial facility will vary between 8 ft. to 12 ft. depending on the projected design year traffic volumes. The Traffic Report Technical Memorandum⁴ indicates that the design year 2020 traffic projections along the Gandy Boulevard (SR 694) and Roosevelt Boulevard corridors will vary between normal and high volume highway criteria as listed on page 2-22 of the FDOT PPM¹. Therefore, the high volume shoulder width of 12 ft. has been selected.

According to the FDOT PPM¹, Table 2.3.2, the minimum shoulder width for a single-lane interchange ramp is 6 ft., of which 2 ft. should be paved on the inside and 5 ft. should be paved on the outside. The minimum outside shoulder width for a two-lane interchange ramp is 10 ft. width 5 ft. paved, and the minimum left. shoulder width should be 6 ft., of which 2 ft. should be paved.

3.7 SIDEWALK WIDTHS

As indicated in the FDOT PPM¹, Section 8.3.1, the minimum width of a sidewalk shall be 5 ft. when separated from the curb by at least a 2 ft. buffer strip and a minimum width of 6 ft. if constructed adjacent to the curb.

3.8 BORDER WIDTHS

The minimum border widths for highways with curb and gutter are listed in the FDOT PPM¹, Table 2.5.2. The minimum border width for an arterial with a design speed of 45 mph or greater is 14 ft. when the travel lanes are located at the curb. When a bike lane or other auxiliary lane is located at the curb, the border width may be reduced to 12 ft. As shown in FDOT PPM Table 2.5.1, the minimum border width for highways with a flush shoulder is 33 ft. The standard border width for freeways (including interchange ramps) is 82 ft.

3.9 BRIDGE SEPARATION DISTANCE

The Structures Design Guidelines⁵ recommends a minimum separation of 20 ft. between the decks of adjacent bridges.

3.10 REFERENCES

1. Plans Preparation Manual (English); Florida Department of Transportation, Tallahassee, Florida; January 2000.
2. AASHTO-A Policy on Geometric Design of Highways and Streets; American Association of State Highway and Transportation Officials; 1994.
3. Pinellas County Comprehensive Plan; Pinellas County Board of County Commissioners; Adopted August 8, 1989, Amended October 1991.
4. Traffic Report Technical Memorandum; Gannett Fleming, Inc. For the Florida Department of Transportation, District 7; January 2001.
5. Structure Design Guidelines; Florida Department of Transportation Bureau of Structures Design, Tallahassee, Florida 1997.

SECTION 4

PROPOSED TYPICAL SECTIONS

This section of the report describes and presents graphically the proposed typical sections developed for this PD&E Study. This Study will evaluate engineering and environmental issues associated with an urban arterial alternative along the Gandy Boulevard (SR 694) corridor from west of the US 19/Gandy Boulevard (SR 694) interchange to east of 4th Street. The Traffic Report Technical Memorandum¹ projects that the existing interchange at Gandy Boulevard (SR 694) and US 19 remains sufficient for design year 2020 traffic. The Traffic Report Technical Memorandum¹ projects that overpasses are needed at the intersections of Grand Avenue and 16th Street. Also, the Traffic Report Technical Memorandum¹ projects that a split diamond interchange is needed by the design year 2020 for the intersections at 4th Street and 9th Street, while Roosevelt Boulevard remains as an at-grade intersection. Finally, the Traffic Report Technical Memorandum¹ projects that a flyover is needed for the northbound I-275 to westbound Gandy Boulevard (SR 694) movement. Since each project segment is unique and will require the analysis of different typical sections, the project segments will be used to define the proposed typical sections for the Gandy Boulevard (SR 694) corridor analysis.

4.1 SEGMENT A

The limits of Segment A are along Gandy Boulevard (SR 694) from west of US 19 to west of Grand Avenue. The existing typical section is a divided six-lane roadway with open drainage ditches on both sides of the roadway. The existing ROW width varies between 102 ft. and 380 ft. The existing land use in this section is a mix of commercial and residential uses.

As indicated in the Traffic Report Technical Memorandum¹, an interchange modification is not needed by the design year 2020 for the US 19 interchange. This interchange is located within this

project segment and will remain as its existing configuration. The associated proposed typical section will be discussed in this section.

4.1.1 Roadway Typical Section

Proposed Roadway Typical Section 1 (Figure 4-1) will be evaluated for this project segment along Gandy Boulevard (SR 694). This proposed typical section is a six-lane divided urban section with a 26 ft. median including a median barrier wall and 12 ft. shoulders. The median will widen just west of Grand Avenue to allow for a dropped inside left turn lane from eastbound Gandy Boulevard (SR 694) to Grand Avenue. This typical section contains three 12 ft. travel lanes in each direction. The typical section also includes frontage roads with two 12 ft. travel lanes in each direction as a one-way loop, 5 ft. sidewalks and a 4 ft. bicycle lane along the outside of the frontage road. The inside shoulder on the frontage road will be 8 ft. paved. The proposed design speed for the mainline for this typical section is 50 mph and requires a minimum ROW width of 222 ft. The proposed design speed for the frontage road is 45 mph.

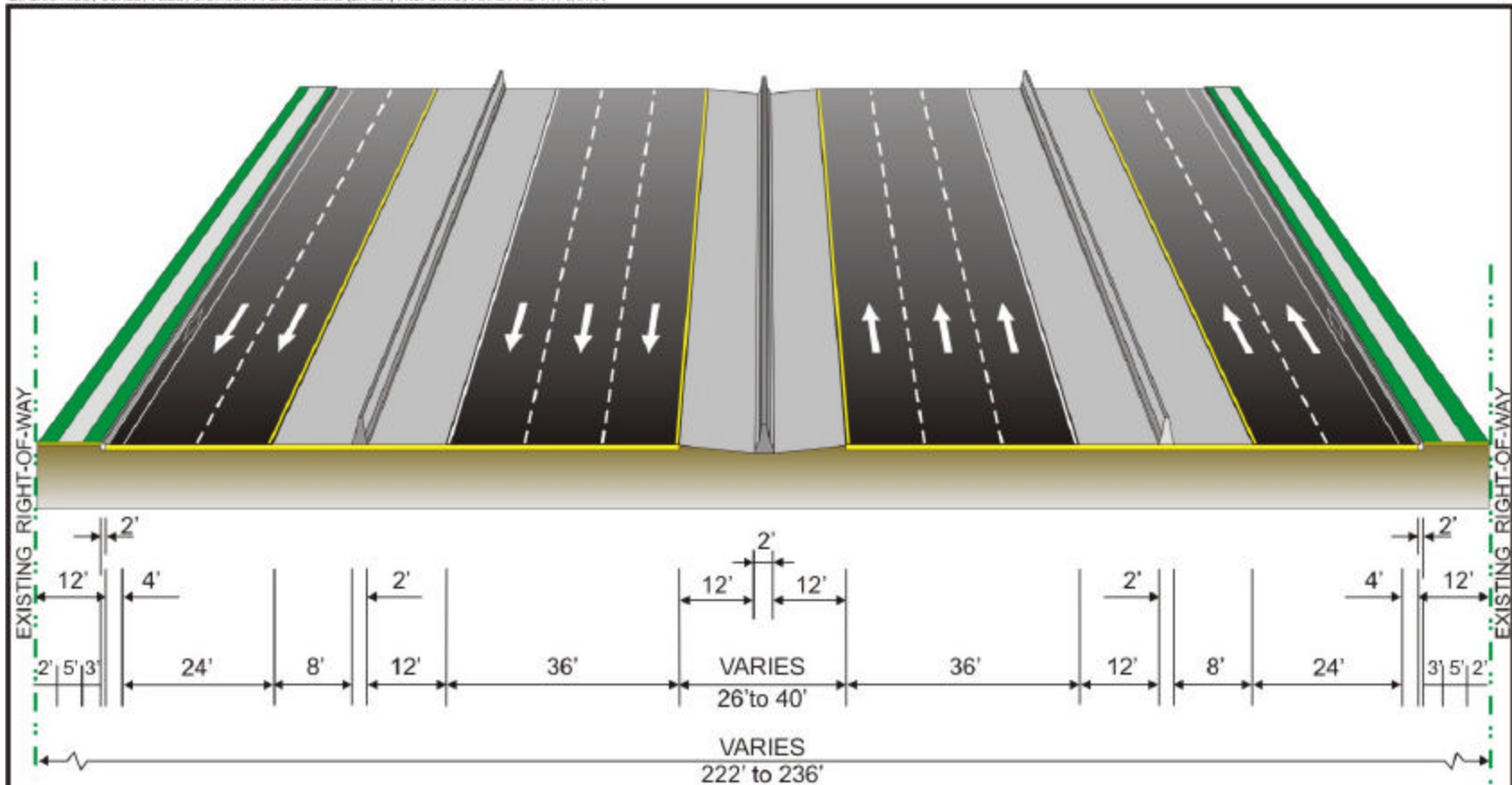
4.1.2 Bridge Typical Sections

No structures are proposed for Segment A.

4.2 SEGMENT B

The limits of Segment B are along Gandy Boulevard (SR 694) from west of Grand Avenue to west of I-275. The existing typical section is a divided six-lane roadway with open drainage ditches and frontage roads on both sides of the roadway. The existing ROW width varies between 160 ft. and 380 ft. The existing land use in this section is a mix of commercial and residential uses.

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GANDY BOULEVARD (SR 694)
Segment A: from East of US 19 to West of Grand Avenue
Segment C: from East of 16th Street to West of 9th Street

**SIX-LANE DIVIDED URBAN
 TWO-LANE ONE-WAY FRONTAGE ROADS**



FLORIDA DEPARTMENT OF TRANSPORTATION
GANDY BOULEVARD (SR 694)

PD&E STUDY
 From West of US 19 to East of 4th Street
 Pinellas County, Florida

**PROPOSED ROADWAY
 TYPICAL SECTION 1**



WPI SEG NO: 256931 1

FIGURE 4-1

As indicated in the Traffic Report Technical Memorandum¹, an overpass is needed by the design year 2020 for the Grand Avenue intersection.

4.2.1 Roadway Typical Section

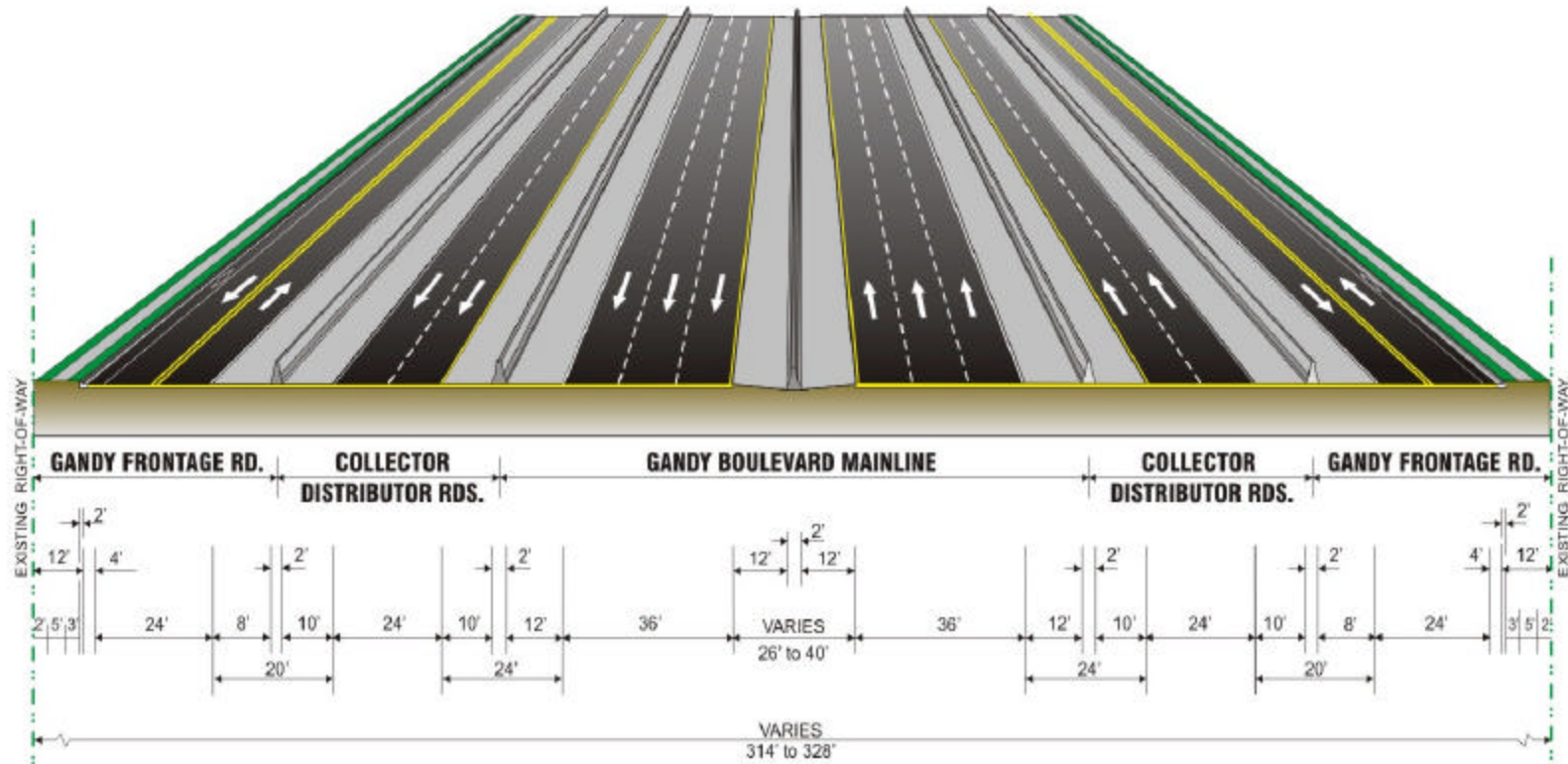
Proposed Roadway Typical Section 2 (Figure 4-2) will be evaluated for this project segment along Gandy Boulevard (SR 694). This proposed typical section is a six-lane divided urban/rural section with a median width varying from 26 ft. (with median barrier) up to 40 ft. (with grassed drainage swales). This typical section contains three 12 ft. travel lanes in each direction. The typical section also includes two-lane two-way frontage roads with two 12 ft. travel lanes in each direction, a 5 ft. sidewalk and a 4 ft. bicycle lane along the outside of the roadway. Finally, the typical section contains two-lane one-way collector-distributor (CD) roads. The CD roads contain two 12 ft. travel lanes and 10 ft. inside and outside shoulders. From the end of Segment B (West of I-275) to the East of I-275, the proposed six-lane divided rural section continues under I-275 while the frontage roads and CD roads end. The proposed design speed for this typical section is 50 mph along the mainline and CD roads and 45 mph for the frontage roads. This section requires a minimum ROW width between 314 ft. and 328 ft.

4.2.2 Bridge Typical Sections

Proposed Bridge Typical Section 3 (Figure 4-3) will be evaluated for this project segment along Gandy Boulevard (SR 694) over Grand Avenue. This typical section is a six-lane divided urban bridge section with a 40 ft. median. The required median width of 40 ft. is used to accommodate two 12 ft. median shoulders and open median space that will be needed through the overpass area.

A transition area will not be required for the median width between the roadway and bridge sections. This typical section contains three 12 ft. travel lanes in each direction. The proposed design speed for this typical section is 50 mph.

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GANDY BOULEVARD (SR 694)
Segment B: from East of Grand Avenue to West of I-275

SIX LANE DIVIDED URBAN
TWO-LANE ONE-WAY COLLECTOR DISTRIBUTOR ROADS
TWO-LANE TWO-WAY FRONTAGE ROADS



FLORIDA DEPARTMENT OF TRANSPORTATION
GANDY BOULEVARD (SR 694)

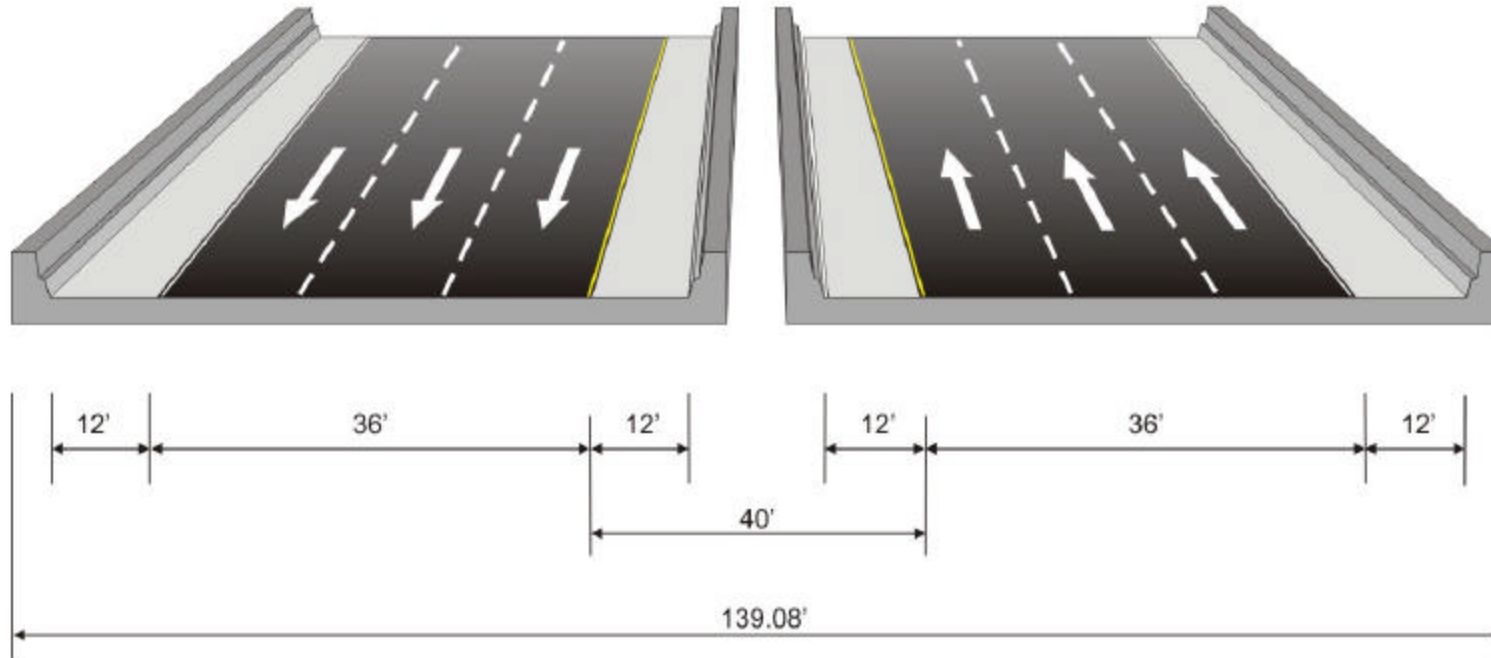
PD&E STUDY
 From West of US 19 to East of 4th Street
 Pinellas County, Florida

PROPOSED ROADWAY
TYPICAL SECTION 2



WPI SEG NO: 256933.1

FIGURE 4-2



GANDY BOULEVARD (SR 694) **Segment B: Bridge over Grand Avenue**



FLORIDA DEPARTMENT OF TRANSPORTATION **GANDY BOULEVARD (SR 694)**

PD&E STUDY
 From West of US 19 to East of 4th Street
 Pinellas County, Florida

PROPOSED BRIDGE **TYPICAL SECTION 3**



WPI SEG NO: 256931 1

FIGURE 4-3

4.3 SEGMENT C

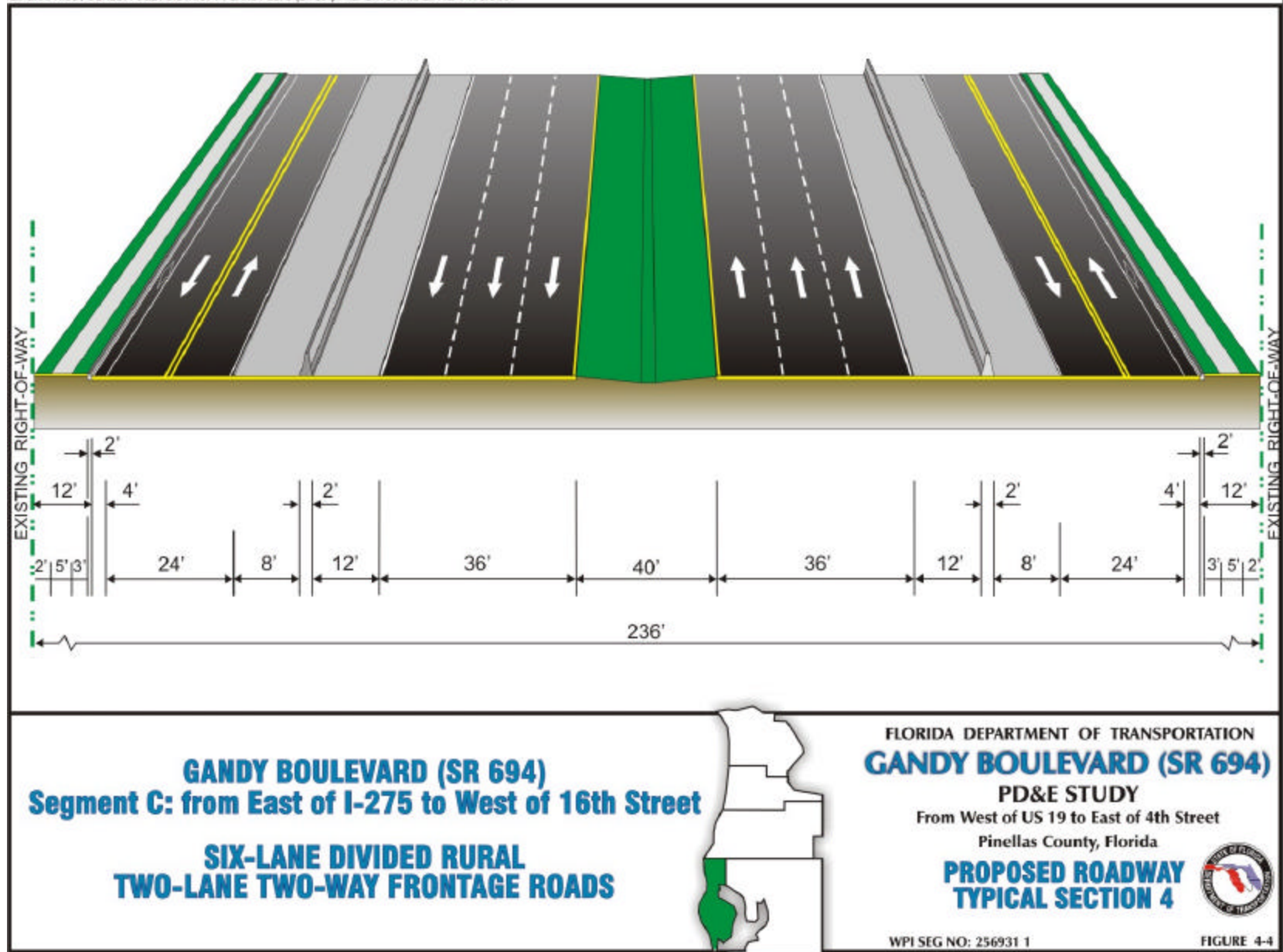
The limits of Segment C are along Gandy Boulevard (SR 694) from west of I-275 to west of 9th Street. The existing typical section is a divided four-lane roadway with open drainage ditches on both sides of the roadway. This segment also contains two-way two-lane frontage roads on the north and south side of Gandy Boulevard (SR 694). The existing ROW width varies between 420 ft. and 550 ft. The existing land use in this section is a mix of commercial and residential uses.

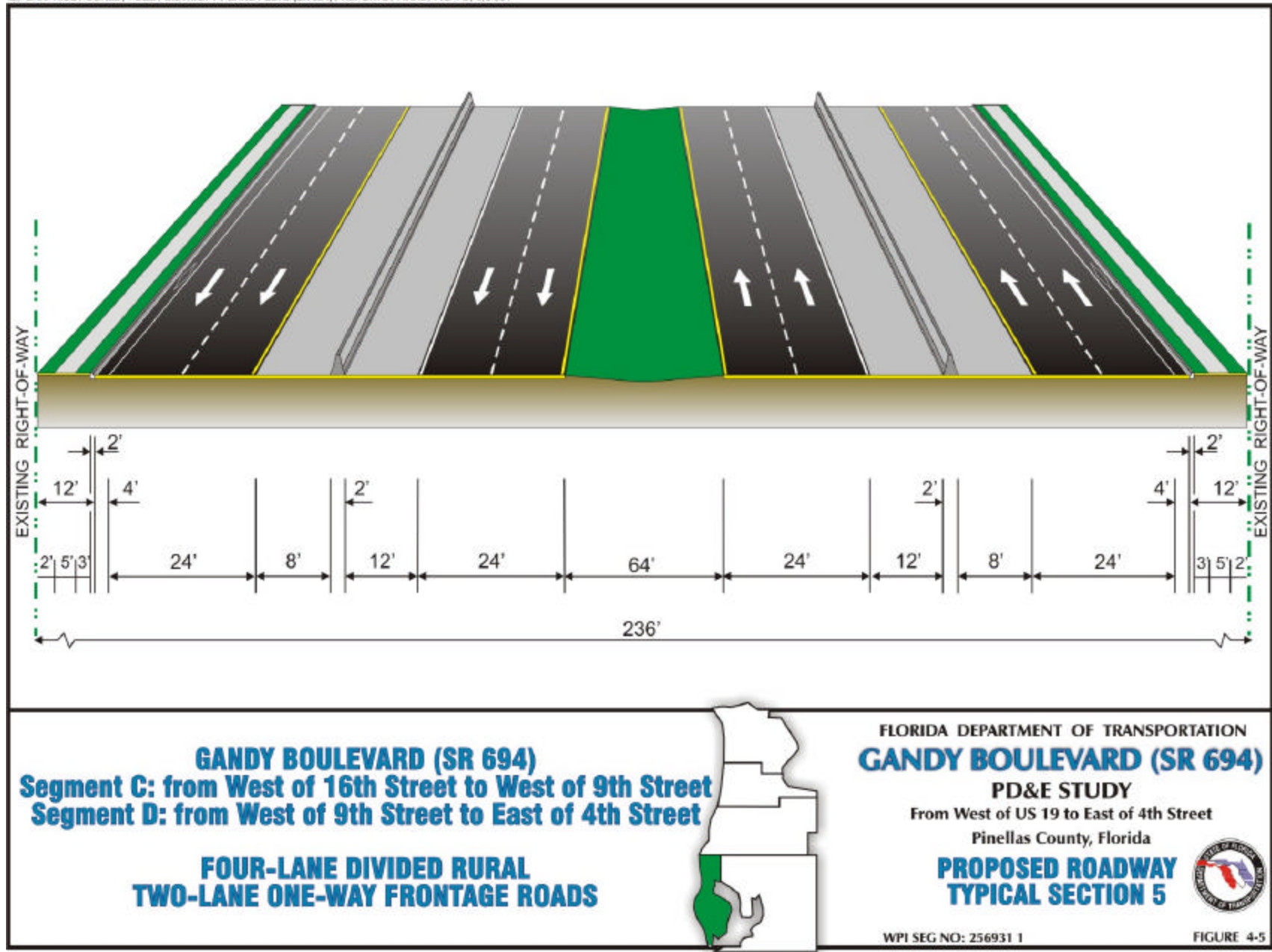
As indicated in the Traffic Report Technical Memorandum¹, an interchange modification is needed by the design year 2020 for the I-275 interchange. The modification will include removing the at-grade intersection between the northbound I-275 off-ramp and Gandy Boulevard (SR 694). The northbound I-275 to westbound Gandy Boulevard (SR 694) movement will be accomplished via a flyover connecting the existing northbound I-275 off-ramp with the existing southbound I-275 off-ramp. Also, as indicated in the Traffic Report Technical Memorandum¹, an overpass is needed by the design year 2020 for the relocated 16th Street intersection. The associated proposed typical sections will be discussed in this section.

4.3.1 Roadway Typical Section

Proposed Roadway Typical Section 4 (Figure 4-4) between I-275 and 16th Street and Proposed Roadway Typical Section 5 (Figure 4-5) between 16th Street and 9th Street will be evaluated for this project segment along Gandy Boulevard (SR 694). These typical sections also contain three 12 ft. travel lanes in each direction. Proposed Roadway Typical Section 4 includes frontage roads with two 12 ft. travel lanes in each direction, 5 ft. sidewalks and a 4 ft. bicycle lane along both sides of the roadway. Basically, the existing two-way frontage roads will be revised to include the bike lane, sidewalks, curb and gutter, shoulders and standard lane widths. From the beginning of Segment C (West of I-275) to the East of I-275,

4-8





the six-lane divided rural section continues under I-275 while the frontage roads end. Proposed Roadway Typical Section 5 also includes frontage roads; however, with two 12 ft. travel lanes in one direction as a one-way loop, 5 ft. sidewalks and a 4 ft. bicycle lane along the outside of the roadway. The proposed design speed for this typical section is 50 mph and requires a ROW width of 236 ft.

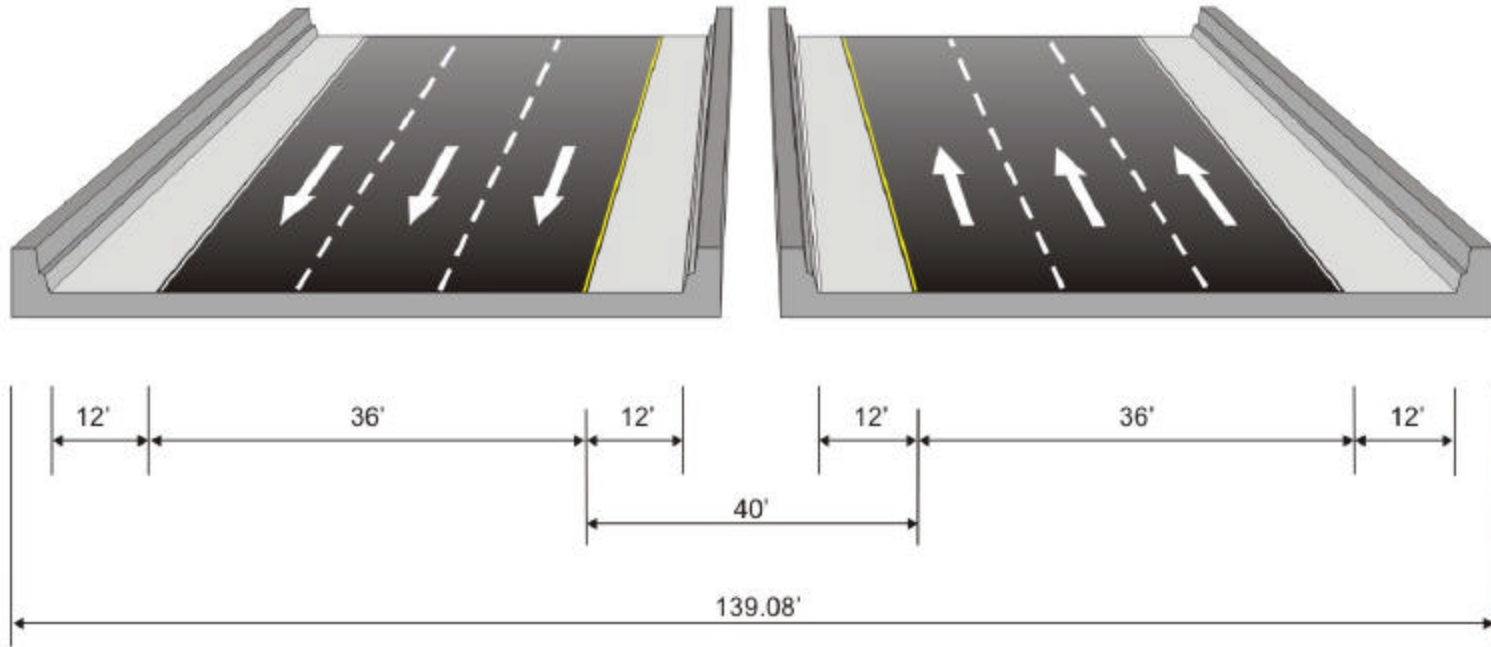
4.3.2 Bridge Typical Sections

The east/west overpass will require the evaluation of a six-lane bridge typical section along Gandy Boulevard (SR 694). Proposed Bridge Typical Section 6 (Figure 4-6) will be evaluated for this project segment along Gandy Boulevard (SR 694) over 16th Street. This typical section is a six-lane divided urban bridge section with a 40 ft. median. The required median width of 40 ft. is used to accommodate two 12 ft. median shoulders and open median space that will be needed through the overpass area. A transition area will not be required for the median width between the roadway and bridge sections. This typical section contains three 12 ft. travel lanes in each direction. Proposed Bridge Typical Section 7 (Figure 4-7) will be evaluated for the single-lane flyover from I-275 northbound to Gandy Boulevard (SR 694) westbound. This typical section is a single-lane, 15 ft. ramp with 6 ft. inside and outside shoulders. The proposed design speed for these typical sections is 50 mph.

4.4 SEGMENT D

The limits of Segment D are along Gandy Boulevard (SR 694) from west of 9th Street North to east of 4th Street. The existing typical section along Gandy Boulevard (SR 694) is a divided four-lane roadway with open drainage ditches on both sides of the roadway. The existing ROW width varies between 220 ft. to 520 ft. The existing land use in this section is a mix of commercial and residential use.

As indicated in the Traffic Report Technical Memorandum¹, interchanges might be needed by the design year 2020 for the intersections of Gandy Boulevard (SR 694)/9th Street, Gandy



GANDY BOULEVARD (SR 694)
Segment B: Bridge over 16 Street

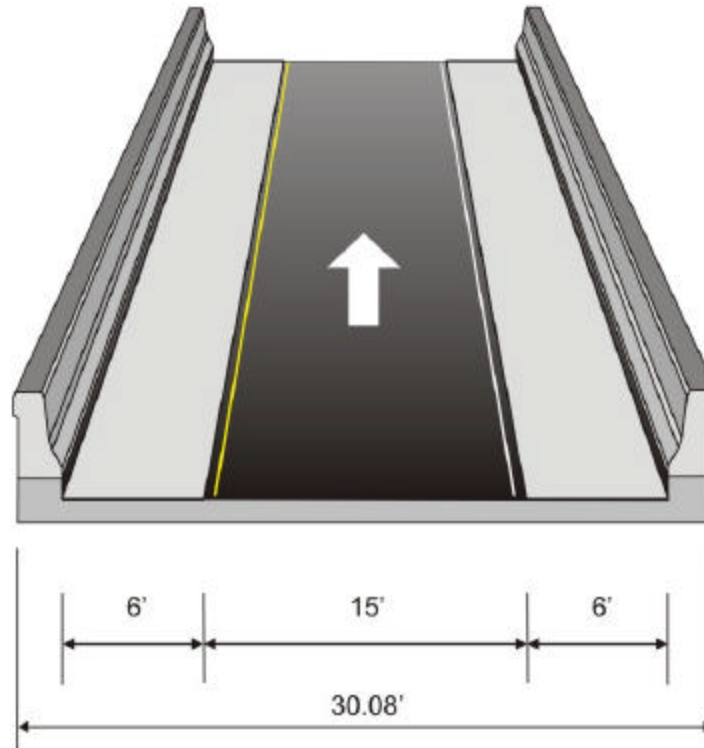


FLORIDA DEPARTMENT OF TRANSPORTATION
GANDY BOULEVARD (SR 694)
 PD&E STUDY
 From West of US 19 to East of 4th Street
 Pinellas County, Florida
**PROPOSED
 BRIDGE TYPICAL
 SECTION 6**



WPI SEG NO: 256931 1

FIGURE 4-6



GANDY BOULEVARD (SR 694)
Segment C: Bridge flyover from Southbound I-275
to Westbound Gandy Boulevard



FLORIDA DEPARTMENT OF TRANSPORTATION
GANDY BOULEVARD (SR 694)

PD&E STUDY
From West of US 19 to East of 4th Street
Pinellas County, Florida

PROPOSED
BRIDGE TYPICAL
SECTION 7



WPI SEG NO: 256931 1

FIGURE 4-7

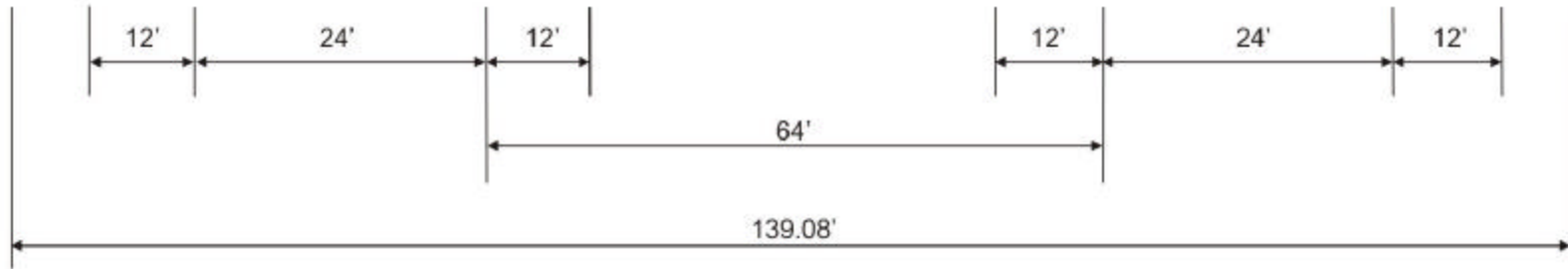
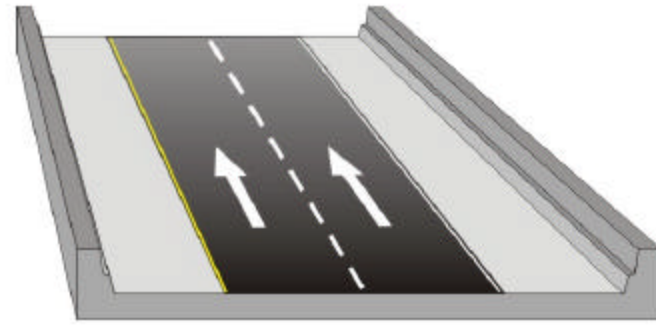
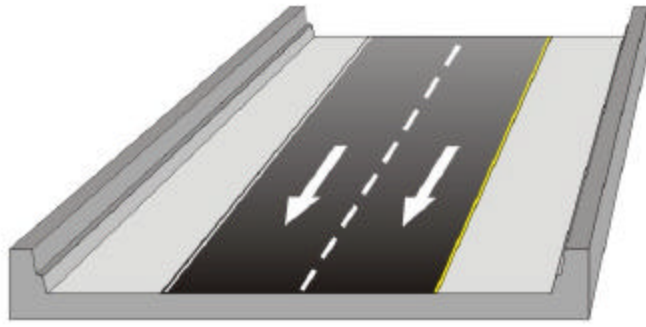
Boulevard (SR 694)/Roosevelt Boulevard, and Gandy Boulevard (SR 694)/4th Street. These interchanges are located within this project segment and will be evaluated for east/west overpasses and possibly a north/south overpass. The associated proposed typical sections will be discussed in this section.

4.4.1 Roadway Typical Section

Proposed Roadway Typical Section 5 (Figure 4-5), previously discussed in Segment C, will also be evaluated for this project segment along Gandy Boulevard (SR 694). This proposed typical section is a four-lane divided section with a 50 ft. median with drainage swales varying up to a 64 ft. median with drainage swales. This typical section contains two 12 ft. travel lanes in each direction. The typical section also includes frontage roads with two 12 ft. travel lanes in each direction as a one-way loop, 5 ft. sidewalks and a 4 ft. bicycle lane along both sides of the roadway. The proposed design speed for this typical section is 50 mph and requires a ROW width of 222 ft.

4.4.2 Bridge Typical Section

The east/west overpass will require the evaluation of a six-lane bridge typical section along Gandy Boulevard (SR 694). Proposed Bridge Typical Section 8 (Figure 4-8) will be evaluated for this project segment along Gandy Boulevard (SR 694) over 9th Street, Roosevelt Boulevard, and 4th Street. This typical section is a four-lane divided urban bridge section with a 64 ft. median and barrier. The required median width of 64 ft. is used to accommodate median shoulders and possibly add one lane in each direction beyond the PD&E Study's design year. A transition area will not be required for the median width between the roadway and bridge sections. This typical section contains two 12 ft. travel lanes in each direction. The proposed design speed for this typical section is 50 mph. The north/south overpass will not be analyzed for this section.



GANDY BOULEVARD (SR 694)
Segment D: Bridge over 9th Street and 4th Street



FLORIDA DEPARTMENT OF TRANSPORTATION
GANDY BOULEVARD (SR 694)

PD&E STUDY
 From West of US 19 to East of 4th Street
 Pinellas County, Florida

**PROPOSED BRIDGE
 TYPICAL SECTION 8**



WPI SEG NO: 256931 1

FIGURE 4-8

4.5 REFERENCES

1. Traffic Report Technical Memorandum; Gannett Fleming, Inc. for the Florida Department of Transportation, District 7; January 2001.

SECTION 5

TYPICAL SECTIONS EVALUATION

All of the typical sections described and depicted in Section 4 are viable and can be utilized for development of improvement alternatives for the PD&E Study.