WETLAND EVALUATION REPORT

US 98 Dade City Bypass

Project Development and Environment Study
from US 301 South
to US 301 North
Pasco County, Florida

WPI Segment Number: 256423 1
Federal-Aid Project Number: 3112-017 P

The proposed action consists of upgrading US 98 from a two-lane to a four-lane divided highway for approximately 2.6 km (1.6 mi).

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District Seven
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EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) is proposing improvements to the US 98 Dade City Bypass (US 98 Bypass), in the vicinity of the US 301 South intersection to the vicinity of the US 301 North intersection, in Dade City, Pasco County, Florida, a distance of about 2.6 kilometers (km) (1.6 miles (mi)). The proposed improvements consist of widening the existing two-lane rural roadway to a four-lane divided highway to accommodate present and future traffic demands.

In accordance with Executive Order 11990, Protection of Wetlands, dated May 23, 1977, a study was conducted to assess the potential wetland impacts of the proposed project. The purposes of this report are to: 1) describe the existing wetlands and other surface water features within the US 98 Bypass corridor; 2) present qualitative and quantitative information regarding potential wetland impacts and conceptual mitigation alternatives; 3) identify permitting and coordination requirements for the project; 4) solicit comments from regulatory agencies with jurisdiction in the study area; and, 5) provide a decision-making tool to aid the project engineers in designating a preferred alignment alternative that will minimize environmental impacts within the project corridor to the greatest extent practicable.

Wetlands are present along both sides of the US 98 Bypass between the US 301 South intersection and CR 35A. There are also wetlands associated with the roadside drainage ditches from CR 35A to north of Meridian Avenue and along the east side of US 98 at the intersection with US 301 North. Widening of the US 98 Bypass on its existing alignment will unavoidably impact these wetland areas. The magnitude of impact would be about the same regardless of which side of US 98 is widened. The loss of wetlands will be mitigated during the subsequent final design phase of this project. The mitigation option to be considered is the use of Florida Statute 373.4137 which allows payment of currently $79,837 per impacted acre (FY 2000/2001) to the Southwest Florida Water Management District for their use in mitigating the impacts.

1.0 INTRODUCTION

The Florida Department of Transportation (FDOT) is proposing improvements to the US 98 Dade City Bypass (US 98 Bypass), from the vicinity of the US 301 South intersection to the vicinity of the US 301 North intersection, in Dade City, Pasco County, Florida, a distance of about 2.6 kilometers (km) (1.6 miles (mi)). The proposed improvements consist of widening the existing two-lane rural roadway to a four-lane divided highway to accommodate present and future traffic demands.

A Project Development and Environment (PD&E) Study is being conducted for the US 98 Bypass in Pasco County by the FDOT which will aid in determining the alignment of the proposed modifications and document the impacts of the proposed alternatives. The PD&E Study will aid the Federal Highway Administration (FHWA), FDOT, and Pasco County in identifying a preferred alternative and will serve as the document of record for support of subsequent engineering decisions as the project advances through design and construction.

In accordance with Executive Order 11990, Protection of Wetlands, dated May 23, 1977, a study was conducted to assess the potential wetland impacts of the proposed project. The purposes of this report are to: 1) describe the existing wetlands and other surface water features within the US 98 Bypass corridor; 2) present qualitative and quantitative information regarding potential wetland impacts and conceptual mitigation alternatives; 3) identify permitting and coordination requirements for the project; 4) solicit comments from regulatory agencies with jurisdiction in the study area; and, 5) provide a decision-making tool to aid the project engineers in designating a preferred alignment alternative that will minimize environmental impacts within the project corridor to the greatest extent practicable.

2.0 PROJECT DESCRIPTION

The FDOT is proposing improvements to the US 98 Dade City Bypass from the vicinity of the US 301 South intersection to the vicinity of the US 301 North intersection, in Dade City, Pasco County, a distance of about 2.6 kilometers (km) (1.6 miles (mi)). The proposed improvements consist of widening the existing two-lane rural roadway to a four-lane divided highway.

To assist in the alternatives analysis, the US 98 Bypass corridor was divided into project segments as follows:

Segment 1 - US 301 South to Connector Road
Segment 2 - Connector Road to Tuskeegee/Buford Avenues
Segment 3 - Tuskeegee/Buford Avenues to Martin Luther King Boulevard
Segment 4 - Martin Luther King Boulevard to River Road
Segment 5 - River Road to US 301 North

2.1 Study Area

US 98 is an east-west arterial highway across the central and panhandle regions of Florida. US 98 traverses peninsular Florida in a northwesterly direction from Palm Beach to the Panhandle. Through the project area, US 98 runs in a northerly direction bypassing the downtown area of Dade City in Pasco County. The US 98 Bypass PD&E Study is located within the limits of Dade City in

eastern Pasco County. Typically, the existing US 98 is a two-lane rural roadway through the project area. Turn lanes have been added at selected intersections. The right-of-way contains numerous jogs and setbacks and varies in width from 18.3 to 35.1 m (60 to 115 ft).

The topography of this section of Pasco County consists of low rolling hills interspersed with many lakes and low, wet areas. Pasco County is in the central or mid-peninsular physiographic zone of the Florida Peninsula. The county is characterized by discontinuous highlands in the form of ridges separated by broad valleys. The ridges are above the static level of the water in the aquifer, but the broad valleys are below it. Broad shallow lakes are common on the valley floors, and smaller deep lakes are on the ridges.

The project area lies along the eastern edge of the Brooksville Ridge and the western edge of the Western Valley regions of Pasco County.

US 301 is considered to be the approximate boundary of the Brooksville Ridge in the project area. Considerable local relief has developed along the ridge with elevations ranging from about 21.3 m to about 91.4 m (70 ft to about 300 ft). Several thousand feet of sedimentary rock, principally various limestone formations, underlie the county. A few feet of sand cover the Brooksville Ridge. There is little surface drainage.

The Western Valley contains the valleys of the Withlacoochee and Hillsborough Rivers and consists mainly of poorly drained sandy soils. Most of the soils have a loamy subsoil, ranging from acidic to alkaline over short distances. Outcroppings of limestone are common. Dade City falls within the Withlacoochee River drainage basin.

Elevations throughout the project corridor range from about 22.8 m (75 ft) National Geodetic Vertical Datum (NGVD), 1929 at the northern end of the project to about 29.0 m (95 ft) at the southern end.

Surface water flow is typically west to east throughout the project area. Ground water flow typically follows the general direction of the surface topography. However, a documented subsurface investigation at the site of the J.H. Williams Oil Company, Inc. fuel depot, located in the southeast quadrant of the intersection of Meridian Avenue and US 98 Bypass revealed that the groundwater flow direction is to the southwest, away from the existing US 98 Bypass right-of-way.

The project location is shown in Figure 1.

2.2 Existing Facility

2.2.1. Existing Typical Section

The existing roadway is typically a two-lane rural facility. The typical section varies throughout the length of the project. From the beginning of the project in the vicinity of the US 301 South intersection to CR 35A, the roadway is a two-lane rural typical section with 2.4 m (8 ft) shoulders (1.2 m (4 ft) paved). From CR 35A to Pasco Street, a two-way center turn lane has been added to the rural typical section. From Pasco Street to north of Meridian Avenue the US 98 Bypass is an urban typical section with a center turn lane, valley gutters along the west side, and vertical curbs along the east side. North of Meridian Avenue to the end of the project in the vicinity of the US 301 North intersection, the

Figure 1 - Project Location Map

roadway is a two-lane rural typical section with center turn lanes added at Martin Luther King Boulevard and Whitehouse Avenue/River Road. The existing roadway typical section for the US 98 Bypass is shown in Figure 2.

2.2.2. Existing Right of-Way

The existing US 98 Bypass right-of-way varies from 18.3 m (60 ft) near the Dade City Railroad Depot at the intersection with Meridian Avenue to 35.1 m (115 ft) south of Martin Luther King Boulevard. Numerous jogs and setbacks are present on both sides of the right-of-way for the length of the project. Additional right-of-way is provided at the intersections of US 301 South, CR 35A and US 301 North. A 7.6 m (25 ft) wide drainage easement is present at Station 50+00 and a 9.1 m (30 ft) wide drainage easement exists at Station 61+50. The existing right-of-way in the area of the project wetlands is shown on the project aerial photography in Appendix E.

2.3 Need for Improvements

Improvements to US 98 are needed to accommodate anticipated traffic projections and to improve traffic circulation and safety conditions. A comparison of the traffic volumes used for the existing design with the current traffic projections through design year 2025 demonstrates the need to increase capacity in the corridor.

The study will evaluate ways to improve vehicular and pedestrian/bicycle safety along the corridor. Enhancements to aid in the reestablishment of access from the neighborhoods to the east with the businesses and services to the west will also be considered. Improvements in traffic operations will be analyzed at all the major intersections along the US 98 Bypass including US 301 South, County Road 35A, Tuskeegee Avenue, Meridian Avenue, Martin Luther King Boulevard, River Road, and US 301 North.

2.4 Alternative Corridor Analysis

A corridor analysis was performed for this project (Corridor Analysis Technical Memorandum). The area evaluated for alternative corridors is bounded by US 301 (7th Street) to the west and the US 98 Bypass to the east. The southern and northern limits of the corridor analysis are in the vicinity of the US 98 Bypass intersections with US 301 South and US 301 North, respectively.

The corridor analysis concluded that improvements to the existing US 98 Bypass corridor are an integral part of the overall long-range transportation plan for Pasco County and Dade City. Planned improvements to connecting roadways and planned and existing development along the corridor are also tied to the proposed improvements to the US 98 Bypass in its existing location. Factors such as cultural impacts, gross relocations (business and residential), community disruption, changes in traffic patterns and land use and right-of-way costs were considered in making the determination that alternative corridors are not viable options to the existing US 98 Bypass corridor.

The corridor analysis proposed that the improvements to the US 98 Bypass consist of widening the existing corridor to a four-lane urban divided typical section with turn lanes, as appropriate.

Figure 2 - Existing US 98 Bypass Typical Section

2.5 Alternatives Analysis

The analysis described in this section follows the project development process by examining the various alternatives considered for this project. The need for the improvements to US 98 is described in Section 2.2. This section describes the analysis for each alternative and the reasons why they were rejected or accepted for further evaluation.

2.5.1 No-Build Alternative

The No-Build Alternative examines the possibility of leaving US 98 in its current condition while allowing for routine maintenance. There are distinct advantages and disadvantages associated with the No-Build Alternative. Based on the considerations listed below, the proposed action has been developed as a design alternative. The No-Build Alternative will remain a viable alternate throughout the study process until after the public hearings, when the final recommendations will be made.

The advantages of the No-Build Alternative are:

- No inconvenience to traffic flow or development due to construction operations.
- No disruption to commerce and no residential or business relocation would be necessary.
- No expenditure of funds for right-of-way acquisition, engineering design, or construction.
- No direct impacts to the adjacent natural environment.

The disadvantages of the No-Build Alternative are:

- Users would experience an increase in both traffic congestion and road user cost, unacceptable level of service, increased carbon monoxide and other air pollutants, and an increase in accident potential as traffic volumes increase on an already congested major thoroughfare.
- A continued rise in maintenance costs due to a potential deterioration of the roadway.
- The roadway will not be compatible with the future transportation network as defined in the Pasco County 2010 Transportation Plan and therefore would require additional improvements to other facilities.
- Increased traffic demand which would exceed roadway capacity.
- There would be no improvement in emergency service response time or in the highway's use as a critical weather emergency evacuation route through Pasco County.

2.5.2 Transportation System Management (TSM) Alternative

The TSM Alternative involves minor intersection improvements, increased turn lane storage, improvement of existing lane configuration marking, and signalization sequencing. The Traffic Report prepared for this project documented that two of the project segments are expected to operate below the FDOT acceptable level of service (LOS) D for the design year 2025 No-Build Alternative. The US 98 Bypass southbound from US 301 North to Martin Luther King Boulevard and US 98 Bypass northbound from US 301 South and Martin Luther King Boulevard are expected to operate at LOS E in the 2025 p.m. and a.m. peak hours, respectively.

Without improvements, the US 98 Bypass would become congested, fail to meet minimum LOS and eventually cause a decrease in the existing air quality. Traffic delays would be extended and accident potential would increase. The TSM Alternative does not provide for additional travel lanes and therefore, under this alternative, the US 98 Bypass is expected to operate at an unacceptable LOS in the design year 2025. The TSM Alternative has been eliminated as a viable alternative.

2.5.3 Multimodal Alternative

Bus Service - The US 98 project corridor is served by the Pasco County Public Transportation Division (PCPT) bus system. The PCPT East Route serves the project corridor north and south along US 301 (7th Street) with stops near the intersections of US 98. The West Route serves the project corridor along US 301 (7th Street) from the intersection of US 98 South and Meridian Avenue. The West Route travels US 98 from the intersection with State Road 35A to Howard Street and from Martin Luther King Boulevard to Meridian Avenue.

Currently, bus service in the Dade City area does not draw a significant number of vehicle trips from US 98 and there are no current plans to increase bus service to the area.

Rail Service - The CSX Railroad parallels the US 98 Dade City Bypass from the CR 35A intersection to US 301 North. Amtrak operates a rail passenger station at the historic Dade City Train Depot at the intersection of Meridian Avenue (SR 52) and the US 98 Bypass. Two passenger trains stop at Dade City daily. Amtrak does not have plans to increase service to Dade City. The passenger train stops closest to Dade City are Wildwood, FL, about 56 km (35 mi) to the north, and Lakeland, FL, about 40 km (25 mi) to the southeast.

This type of rail service primarily provides transportation opportunities for interregional travel. The US 98 Bypass in Dade City accommodates both interregional and local traffic. However, the majority of north-south interregional traffic in this area is accommodated on I-75, about 14.5 km (9 mi) to the west.

Airports - The nearest commercial passenger air service is Tampa International Airport located in Tampa, FL, about 80 km (50 mi) southwest of Dade City. The nearest general aviation public airport is the Hernando County Airport located south of Brooksville, FL about 45 km (28 mi) northwest of Dade City. Air travelers to and from the Dade City area must use surface transportation to access the airports.

The Multimodal Alternative to the proposed improvements to the US 98 Bypass was eliminated from further consideration because it does not *provide the additional capacity needed to accommodate anticipated traffic projections, nor does it improve traffic circulation or safety conditions.*

2.5.4 Study Alternatives

The study alternatives considered for the US 98 project are construction alternatives because the No-Build, Multimodal and TSM Alternatives do not meet the future transportation needs of the region. Without improvements to this section of US 98, transportation congestion will increase as the level of service (LOS) falls to an unacceptable level and emergency and social services transportation opportunities eventually deteriorate. The right-of-way and alignment alternatives considered for this project were based on the avoidance strategy (left, right and center analysis) described in the Corridor Analysis Technical Memorandum,, and are summarized in the Preliminary Engineering Report both prepared for this project.

2.5.4.1 Typical Sections

The improvement proposed for the US 98 Bypass is a four-lane divided urban typical section. This typical section would contain a 6.6 m (22 ft) wide raised median, four 3.6 m (12 ft) lanes (two in each direction), 1.2 m (4 ft) bike lanes in each direction, and 3.6 m (12 ft) borders (containing a 0.6 m (2 ft) curb and gutter, a 0.9 m (3 ft) utility strip, a 1.8 m (5 ft) sidewalk, and a 0.6 m (2 ft) back-of-sidewalk buffer) in both directions. This would require a typical section width of 31.7 m (102 ft). Left turn lanes would be accommodated within the median. Where exclusive right turn lanes are necessary, an additional 3.6 m (12 ft) would be required for a total of 35.4 m (116 ft) of right-of-way. The proposed four-lane typical section is shown in Figure 3.

2.5.4.2 Alignments

The existing US 98 corridor was evaluated to develop a strategy to minimize or avoid impacts to the human and natural environment by considering widening to the left, right, or center on the existing alignment. This avoidance strategy was used in selecting the proposed alignment alternatives and is intended to minimize impacts to wetlands, hazardous materials and petroleum contamination sites,

threatened or endangered species, floodplains, noise sensitive sites, historic and archaeologic sites, business and residential relocations, and community services.

The alignment configurations considered for this project were based on the avoidance and minimization strategy developed in the corridor analysis described in Section 7.0 of the PER and the Corridor Analysis Technical Memorandum.

Three alignment alternatives (left, center and right) were considered for all five project segments. For analysis purposes, the project has been separated into five segments. The project segments were defined by assigning logical local termini within the project limits. The five segments are described below.

The south portion of the project from US 301 South to the intersection with Connector Road is Segment 1, a length of 0.5 km (0.3 mi). Segment 1 includes the area of US 301/98 from Heather Place to the US 301 South intersection.

Segment 2 covers the area from Connector Road to the intersection of Tuskeegee/Buford Avenues, a length of 0.55 km (0.35 mi). Segment 2 includes the realigned intersection of CR 35A.

Segment 3 is the center portion of the project from the intersection of Tuskeegee/Buford Avenues to Martin Luther King Boulevard, a length of 0.80 km (0.50 mi).

Segment 4 is from Martin King Boulevard to River Road, a length of 0.50 km (0.30 mi).

The north portion of the project from River Road to US 301 North is Segment 5, a length of 0.25 km (0.15 mi). Segment 5 includes the transition at River Road and the areas north and south of the US 301 North intersection.

Figure 3 - Proposed Four-Lane Divided Urban Typical Section

The potential wetland impacts for all of the alignment alternatives in Segments 1, 2, 3 and 5 are described in Section 3.4.

2.6 Existing Environmental Characteristics

This section presents the existing land use characteristics as well as the existing natural and biological features, such as upland plant communities, listed species, and soils. It is important to consider these features when evaluating the overall project area.

2.6.1 Land Use

The 1989 Pasco County and 1988 Dade City Existing Land Use Maps, 1977 Southwest Florida Water Management District (SWFWMD), 1998 County and 1999 project aerial photography, and field inspections in April through July 1999 were used to determine the existing land use in the US 98 Bypass corridor. The following is a brief description of the existing land uses and the general location for these uses.

Residential - Less than 5 percent of the US 98 project corridor contains residential areas. Low and medium density residential areas are scattered throughout the project vicinity; however, most residential properties are not adjacent to the US 98 right-of-way. Residential properties adjacent to the existing right-of-way are located in the area of the US 301 South intersection and along the north side of US 98 between US 301 South and CR 35A.

Commercial & Services - About 50 percent of the US 98 project corridor contains developed commercial uses. Strip commercial areas are located on both sides of US 98 at the intersection with CR 35A, along the west side of US 98 south of Meridian Avenue and along the intersection with US 301 North. Scattered commercial properties are present for the length of the project including a car dealership, restaurants, convenience stores, gasoline stations and an abandoned fuel depot.

Vacant & Undeveloped - Less than 20 percent of the US 98 project corridor contains vacant and undeveloped lands. Vacant areas are scattered along the project corridor intermixed with the residential and commercial properties. The majority of the currently vacant and undeveloped land is shown for commercial uses on the future land use maps.

Industrial - Less than 1 percent of the US 98 project corridor contains industrial uses. A large industrial area containing the Lykes citrus processing plant is located east of US 98 at the northern end of the project.

Agricultural - Agricultural land is present along both sides of US 98 between the intersections of US 301 South and CR 35A. This represents less than 1 percent of the project corridor.

Recreation/Open Space - Less than 10 percent of the US 98 project corridor contains recreation/open space areas. A portion of an abandoned public ball field is located south of the intersection with Martin Luther King Boulevard. A stormwater management pond and floodplain compensation area for the expansion of the East Pasco County Government Center occupy several acres adjacent to US 98 south of the abandoned ball field. Open space exists between US 98 and the CSX railroad north

and south of Meridian Avenue and Martin Luther King Boulevard. The East Pasco County Government Center, located north of Meridian Avenue, contains open space adjacent to US 98.

Existing Special Land Use Conditions - Certain types of land uses are particularly important due to the special conditions surrounding them and the hardships involved in the relocation of such areas. Examples of this found adjacent to the project corridor are the CSX railroad right-of-way to the east of US 98 and the historic Dade City train station at Meridian Avenue. The Calvary Assembly Church, Hibiscus Park and the Dade City Garden Club (housed in a historic former church) are located near the intersection with US 301 South.

The existing land use is shown in Figure 4.

Future Land Use - The 1988 Dade City and 2010 Pasco County Future Land Use Maps show that land use in the US 98 Dade City Bypass corridor will remain predominantly commercial/retail uses with areas of residential, industrial and public lands.

The proposed improvements to US 98 would utilize the existing corridor and land use is not anticipated to change significantly as a result of the improvements.

The future land use is shown in Figure 5.

2.6.2 Natural and Biological Features

2.6.2.1 Plant Communities

Prior to field surveys, aerial photographs of the project study area were reviewed. Land uses were classified in accordance with the Florida Land Use Cover and Forms Classification System (FLUCFCS) (FDOT, 1985), and subsequently groundtruthed for verification. Field reviews were conducted in November 1999 to verify cover types and habitats within the study area. Upland communities within the study area are discussed below. Wetland plant communities are discussed in Section 3.2.

The upland floral communities in the US 98 Bypass study area consist of small isolated wooded areas and grassy swales associated with industrial areas. The wooded areas are dominated by live oak (*Quercus virginiana*) and the grassy swales are dominated by St. Augustine grass (*Stenotaphrum secundatum*).

2.6.2.2 Listed Species

Pursuant to Section 7(c) of the Endangered Species Act of 1973, as amended, the study area was evaluated for the potential occurrence of threatened and endangered species. Literature reviews were conducted and data was requested from the U.S. Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FFWCC), and the Florida Natural Areas Inventory (FNAI).

An Endangered Species Evaluation Memorandum prepared for this project did not identify any listed species or critical habitat that would be impacted by the proposed improvements. Coordination with the FFWCC indicates that there are no known bald eagle nests within 1.6 km (1 mi) of the US 98

Bypass project site. No occurrence records of listed species or critical habitat are contained within the FFWCC

Figure 4 - Existing Land Use

Figure 5 - Future Land Use

database for the project area. A copy of the technical memorandum and correspondence with the USFWS and the FFWCC are included in Appendix D.

2.6.2.3 Soils

The geotechnical data reviewed for this study includes the US Department of Agriculture, Soil Conservation Service (now Natural Resource Conservation Service (NRCS)), Soil Survey of Pasco County (Soil Survey), June 1982; the US Geological Survey (USGS), Quadrangle Map "Dade City, Florida, 1960, for the respective sections of this project; 1977 SWFWMD aerial photographs of the existing alignment; FDOT roadway construction plans prepared for the existing roadway and the Preliminary Geotechnical Report,, prepared for this project. A windshield survey was performed to identify areas where existing pavement conditions indicate the possible presence of unsuitable subsurface conditions (peat, muck) beneath roadways; to observe general topography, soil and groundwater conditions along the alignment; and, to identify areas where significant pavement distress is present within the mainline roadway.

The Soil Survey was reviewed with respect to near-surface soil conditions along the project. The geology of Pasco County can briefly be described as surficial sands and clay, sandy clays and clayey sands overlying limestone.

The Soil Survey indicates that there are four mapping units within the project area. The predominant soil groups are Tavares Urban Land Complex and miscellaneous Urban Land in the northern and central portions of the project with Quartzipsamments, Lake and Placid Fine Sands in the southern portion. The soil groups are summarized in Table 1.

Hand auger borings were performed generally every 152.4 m (500 ft) offset right and left of the survey baseline to evaluate the subsurface conditions along the proposed roadway alignment. The auger borings were performed to depths of 1.5 m (5 ft) below existing grades. In the area of the potential stormwater ponds, hand auger borings were advanced generally 0.3 to 0.6 m (1 to 2 ft) below the ground water level encountered in the borings or to a maximum depth of 3.0 m (10 ft).

The groundwater table was not encountered to a depth of 1.5 m (5 ft) in any of the shallow borings adjacent to the existing roadway. Groundwater was encountered at about 2.1 m (7 ft) below land surface (bls) in the area of potential Pond Location 1 (right of roadway between Station 58+00 to Station 61+00) and at 1.2 m (4 ft) bls in the area of potential Pond Location 4 at about 24.4 m (80 ft) left of Station 77+60.

Seasonal high groundwater table (SHGWT) depths were estimated along the roadway alignment from several of the auger borings. Generally the SHGWT within and adjacent to the existing right-of-way is estimated to be greater than 1.5 m (5 ft) bls. In the areas of the potential pond locations, the SHGWT is estimated to range from 0.9 to greater than 3.0 m (3 to >10 ft) bls. Refer to the Preliminary Geotechnical Report, prepared for this project, for specific SHGWT locations and depths.

The USGS topographic survey map was reviewed for ground surface features. The natural ground surface elevations along the project vary from 21.3 to 29.0 m (70 to 95 ft) National Geodetic Vertical Datum of 1929 (NGVD).

Table 1

Summary of Soil Groups
US 98 Bypass Wetland Evaluation Report

Soil Name (Map Unit No.)	Depth m (in)	Classification		Permeability m/hour (in/hour)	Seasonal High Water Table Depth m (ft)	Hydrologic Group
		AASHTO[1] Group	USCS[2] Group			
Tavares Urban Land Complex (15)	0 - 2.1 (0 - 86)	A-3	SP[3], SP-SM[4]	>0.5 (>20)	1 - 1.8 (3.5 - 6)	A
Urban Land (38)	Soils so altered that identification is not feasible.					-
Quartzipsamments (24)	0 - 1.5 (0 - 60)	A-3	SP, SP-SM	High	1.8 (>6)	-
Lake (32)	0 - 2.0 (0 - 80)	A-3/A-2-4	SP-SM	0.15 - 0.5 (6 - 20)	1.8 (>6)	A
Placid (70)	0 - 2.0 (0 - 80)	A-3/A-2-4	SP, SP-SM, SM[5]	0.15 - 0.5 (6 - 20)	(0-1.0)	B/D

Source: Soil Survey of Pasco County NRCS, June 1992.

Notes:
[1]American Association of State Highway and Transportation Officials
[2]Unified Soil Classification System
[3]SP - Poorly graded sand (with gravel)
[4]SP-SM - Poorly graded sand (with sand and gravel)
[5]SM - Silty sand (with gravel)

The hydrologic soil groups range from A to D throughout the project length. The soils along the Brooksville Ridge generally fall in hydrologic group A (which includes most of the corridor), while the soils in the Western Valley generally fall into the C and D hydrologic groups. An area of D hydrologic group soil lies to the east of US 98 between the intersections of US 301 South and CR 35A in the southern end of the project corridor. Group A soils have a high infiltration rate (low runoff potential) when thoroughly wet. They are mainly deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission. Group D soils have a very slow infiltration rate (high runoff potential) when thoroughly wet. They consist chiefly of clays having a high shrink-swell potential, a permanent high water table, a claypan or clay layer at or near the surface, and are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

A copy of the soil survey map for the US 98 Bypass corridor is shown in Figure 6.

Figure 6 - Soils Map

3.0 WETLANDS

3.1 Study Methodology

Wetlands within the project limits were initially identified through review of mapping resources including the Soil Survey of Pasco County, USFWS National Wetlands Inventory mapping, and 1:1000 (1"=100') scale project aerial photography. Wetlands were identified in the field utilizing the U. S. Army Corps of Engineers (USACOE), Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1987). Wetlands were also photographed (see Appendix A). The dominant floral species, spatial area, hydrological contiguity, anticipated impacts, and related observations are contained in the following portions of this section.

The wetlands were classified according to the USFWS methodology (Cowardin, *et.al.*, 1979). The land use, vegetation cover and land form for each wetland was identified using the FDOT Florida Land Use, Cover and Forms Classification System (FLUCFCS), Second Edition, September 1985. Sizes of existing wetlands and potential wetland impacts were determined planimetrically from project aerial photographs. Wetlands which may be potentially impacted by the project were assessed for functional significance using the Wetland Rapid Assessment Procedure (WRAP) as developed by the South Florida Water Management District and utilized by the USACOE.

3.2 Wetlands Within the Project Limits

Five wetlands were identified within the US 98 Bypass project study area. They are contained within the Hillsborough-Withlacoochee Regional Drainage Basin. Wetland 1A is a wet field currently being used as a pasture for cattle. Wetland 1B contains the drainageway for Wetland 1A. Wetland 2 is a small depression area filled with shrubby wetland trees. Wetlands 3 and 4 are classified as wet ditches and were created for the conveyance of stormwater. Wetland 5 is a dry ditch created for the conveyance of stormwater.

A discussion of the characteristics of the wetlands is presented below, including:

- USFWS Classification
- Location
- Vegetation
- Hydrology
- Soils
- Relative Quality

Wetland 1A is classified as a palustrine emergent, persistent, seasonally flooded system (PEM1C). It is located in Segment 1 on the west side of the road, approximately 152.4 m (500 ft) north of Bougainvilla Avenue and divided by the US 98 Bypass. Wetland 1A contains a wet pasture currently being heavily grazed by cattle. The groundcover is dominated by undesirable exotic pasture grasses such as bahiagrass (*Paspalum notatum*). Wetland 1A is surrounded by US 98 and a pasture. Surface water runs off the pasture and the road and collects in this system and then drains to the east side of the US 98 Bypass into Wetland 1B across the roadway. No standing water was observed, but the area's strongest wetland indicator was the significant horizon of highly organic (muck) soil. The Soil Survey of Pasco County indicates this system as having Placid fine sand, which is listed as a Federal hydric soil. This area is likely seasonally wet only. Due to the current land use, Wetland 1A is significantly altered and therefore offers no substantial ecological value. Wetland 1A offers little to no wildlife habitat or value.

Wetland 1B is classified as a palustrine, scrub/shrub, broad-leaved deciduous, seasonally flooded, excavated system ($PSS1C_X$) located on the east side of US 98 and contains the drainage way for Wetland 1A. This drainage way contains shrub plant species such as salt bush (*Baccharis halimifolia*) and primrose willow (*Ludwigia peruviana*). Herbaceous species include St. Augustine grass and broomsedge (*Andropogon glomeratus*). Wetland 1B is bordered by US 98, a car lot, and a pasture. The soil is the same as Wetland 1A and similar to 1A of this system, it is highly disturbed due to anthropogenic activities. Wetlands 1B offers little to no wildlife habitat or value.

Wetland 2 is located in Segment 2 at the intersection of County Road 35A and US 98 on the west side of US 98. It is classified as a palustrine scrub/shrub, broad-leaved deciduous, seasonally flooded, excavated system ($PSS1C_X$). This small system was possibly created as a stormwater treatment facility and exhibited recent indications of nuisance plant species maintenance activities. Dominant shrub species include Carolina willow (*Salix caroliniana*) and primrose willow. Aerial coverage by herbaceous species is very low. Wetland 2 is bordered by US 98, a parking lot, and a grass field. Water quality within this system appears to be extremely low, which could be explained by the commercial land use that surrounds it. The soil in this system is listed as Tavares-Urban land complex, which is not listed as a Federal hydric soil. This wetland could provide some cover for small mammals and aquatic fauna, but is a small, disturbed, isolated system.

Wetland 3 is classified as a palustrine, emergent, persistent, seasonally flooded, excavated system ($PEM1C_X$). It runs parallel with US 98 on the west side of the road in Segment 3, starting at Live Oak Road and extending north approximately 304.8 m (1,000 ft). This system receives frequent maintenance activities which greatly reduces its vegetative cover. Open water is dominant in this system because of the recent maintenance activities. Wetland 3 is bordered by US 98, the county courthouse, and a large grass field. Water quality in this system is low, and it receives water primarily from the parking lot and the road. The soil in this system is classified as urban land, which is not a Federally-listed hydric soil. This system has been significantly disturbed and poses little habitat for wildlife.

Wetland 4 is classified as a palustrine, scrub/shrub, broad-leaved deciduous, seasonally flooded, excavated system ($PSS1C_X$)**.** It is located in Segment 3 on the opposite side of the road from Wetland 3. Species observed in this system include white mulberry (*Morus alba*), Carolina willow and elderberry (*Sambucus canadensis*). The presence of a vertical vegetative stratum indicates that maintenance activities occur at greater intervals than in Wetland 3; that is, there is less maintenance activities that occur at this wetland which allows scrub/shrub vegetation to grow at longer intervals than at Wetland 3. Wetland 4 is bordered by US 98 and a railroad bed. Water quality has been significantly reduced due to its location. The soil is listed as urban land, which is not a Federally-listed hydric soil. This system supports very little wildlife habitat and therefore, does not offer substantial ecological value.

Wetland 5 is classified as a palustrine, unconsolidated sand bottom,, seasonally flooded/well drained, excavated system ($PUB2D_X$). It is located on and collects stormwater runoff from the east side of US 98 in Segment 5. This drainage way contains no plant species within the confines of the channel. The channel showed signs of routine maintenance and high velocity flows, but contained no water or evidence of chronic inundation. The top of the east bank was vegetated with beggars ticks (*Bidens* sp) and upland grasses. The top of the west bank was dominated by paper

mulberry (Broussonetia papyrifera). Wetland 5 is bordered by US 98 and the entrance road to the Vitality Beverages, Inc. (Lykes Pasco) plant. The soil type is Tavares Urban land complex, which is not considered a hydric soil type. Wetland 5 was littered with trash and showed no evidence of or potential for wildlife utilization.

The locations of project wetlands are shown in Figure 7 and on the project aerials in Appendix E. A summary of the classifications, wetland areas, and area within right of way is included in Table 2.

Table 2
Wetland Summary
US 98 Bypass Wetland Evaluation Report

Wetland No.	USFWS Classification	FLUCFCS Code	Total Wetland Area ha (ac)	Area within Existing Right-of-Way ha (ac)
1A	PEM1C	643	0.18 (0.44)	0.003 (0.008)
1B	$PSS1C_X$	510	0.002 (0.005)*	0.001 (0.002)
2	$PSS1C_X$	616	0.17 (0.41)	0 (0)
3	$PEM1C_X$	510	0.09 (0.22)	0.08 (0.20)
4	$PSS1C_X$	510	0.37 (0.91)	0.02 (0.04)
5	$PUB2D_X$	510	.02 (.06)	0 (0)

* Wetland 1B is a small portion of a larger wetland system draining into Shadow Lake and eventually into the Withlacoochee River. The total wetland area shown is the maximum area potentially affected by the proposed improvements.

The descriptions of the USFWS Classification codes used to identify the wetland areas within the US 98 Bypass project limits are listed below.

USFWS Classification Code	Description
System - P	Palustrine
Class - EM, SS	Emergent, Scrub-shrub, Unconsolidated bottom
Subclass - 1	Persistent, Broad-leaved deciduous
2	Sand
Water Regime - C	Seasonally flooded
D	Seasonally flooded, well drained
Special Modifier - x	Excavated

Figure 7 - Wetland Location Map

The descriptions of the FLUCFCS codes used to identify the wetland areas within the US 98 Bypass project limits are listed below.

FLUCFCS Code	Description
510	Streams and Waterways - This category includes rivers, creeks, canals and other linear water bodies.
616	Inland Ponds and Sloughs - These communities are associated with depressions and drainage areas that are not associated with streams or lakes.
643	Wet Prairies - This classification is composed of dominantly grassy vegetation on wet soils and is usually distinguished from marshes by having less water and shorter herbage.

3.3 Results of WRAP Analyses

Final determination of jurisdictional areas, proposed wetland impacts, and mitigation requirements will occur through coordination between FDOT and natural resource regulatory agencies during the final design and permitting phase of the project.

Wetland Rapid Assessment Procedure (WRAP) analyses were conducted to assess wetland function and values for wetlands within the study area, using Technical Publication REG-001 as a guide. WRAP incorporates concepts from the USFWS Habitat Evaluation Procedures (HEP, 1980) and the SWFWMD Save Our Rivers Project, Evaluation Matrix (SOR, 1992). The WRAP assessment utilizes a holistic approach to evaluate ecological communities based on the following variables: wildlife utilization, wetland overstory/shrub canopy of desirable species, wetland vegetative groundcover of desirable species, adjacent upland/wetland buffer, field indicators of wetland hydrology, and water quality input and treatment systems. The WRAP field data sheets are shown in Appendix B and the results are summarized in Table 3.

The *wildlife utilization* variable is a measure of observations and other indicators (i.e. scat, tracks, etc.) of wildlife, primarily wetland dependent species. The *wetland overstory/shrub canopy* variable is a functional assessment of the canopy strata. It is evaluated based on food resources, cover, nesting potential, and appropriateness of the vegetative community. The *vegetative groundcover* variable is a measure of the presence, abundance, appropriateness, and condition of vegetative groundcover within the wetland. Undesirable plant species include exotic and nuisance plant species (i.e. Brazilian pepper, Australian pine, etc.). The adjacent *habitat support/buffer* variable is a measure of the area adjacent to the subject wetland and the landscape setting of the wetland. This variable is evaluated based on the adjacent buffer size and the ecological attributes (i.e. cover, food sources, and roosting areas for wildlife) that this area is providing in association with the wetland that is being assessed. The *field indicators of wetland hydrology* measures the hydrologic regime based on observed field indicators for the subject wetland including hydroperiod duration and magnitude. Both vegetative and hydrologic indicators are utilized to assess the hydrology of a wetland system. The final criterion, *water quality input and treatment*, is a measure

of the quality of the surface water flowing into the subject wetland from adjacent land uses. Surrounding land uses and any on-site pretreatment of surface waters prior to discharge into wetlands are considered.

Five wetlands were identified within the project study area. Each wetland type was evaluated based upon its own attributes and was not compared to a different type of system (i.e. scrub-shrub vs. emergent swale). The highest score an individual wetland can receive on any one variable is a 3.0 and the lowest is 0.0. The WRAP score is the sum of the scores for the rated variables, divided by the sum of maximum possible scores for the rated variables. The final rating score is expressed numerically with a number between 0 and 1, with one representing the highest quality wetland, and can be calculated as follows:

WRAP Score = Σ scores for rated variable _ Σ maximum possible scores for rated variables

Table 3
Results of WRAP Analysis
US 98 Bypass Wetland Evaluation Report

Wetland No.	Wildlife Utilization Score	Wetland Canopy Score	Wetland Ground Cover Score	Habitat Support Buffer Score	Field Hydrology Score	Water Quality & Treatment Score	Overall Score
1A	0.00	-	0.00	0.38	0.00	1.53	0.127
1B	0.50	-	1.00	0.50	0.50	1.06	0.238
2	1.00	1.00	0.50	0.25	1.00	2.09	0.170
3	0.00	-	0.50	0.00	1.5	0.55	0.324
4	1.00	0.50	0.50	0.00	0.00	0.50	0.139
5	0.00	-	0.00	0.00	0.00	0.5	0.03

3.4 Analysis of Potential Wetland Impacts

Impacts analyses were performed for the build alternative concepts. Aerial photography, survey data, and approximate wetland boundaries were used to estimate the area of potential impacts from the proposed alternatives. The potential impacts to wetlands in the project area are direct impacts caused by the placement of roadway embankment fill. Temporary impacts would also occur during the construction of the project. Wetlands 1A and 1B are located

in Segment 1. Wetland 2 is in Segment 2. Wetlands 3 and 4 are located in Segment 3 and Wetland 5 is located in Segment 5.

3.4.1 Potential Impact of Alignment Alternatives

Potential wetland impacts for each of the alternative alignments considered were calculated using the alternative concepts overlaid on the project aerial photography with the wetland delineations. Three alignment alternatives were considered for all five Segments (left, center and right). All three of the alignment alternatives in Segments 1, 2, 3 and 5 would directly impact wetlands. The potential impacts to each wetland are shown by project segment for each alternative alignment in Table 4.

Table 4

Potential Wetland Impacts

US 98 Bypass Wetland Evaluation Report

Wetland No.	Potential Wetland Impacts ha (ac)											
	Segment 1 US 301 South to Connector Road			Segment 2 Connector Road to Tuskeegee Avenue			Segment 3 Tuskeegee Avenue to MLK Boulevard			Segment 5 River Road to US 301 North		
	Left	Center	Right	Left	Center	Right	Left	Center	Right	Left	Center	Right
1A	0.12 (0.29)	0.06 (0.15)	0.003 (0.008)									
1B	0.001 (0.002)	0.002 (0.004)	0.002 (0.005)									
2				0.13 (0.31)	0.08 (0.20)	0 (0)						
3							0.09	0.09	0.08			

							(0.22)	(0.22)	(0.20)			
4							0.02 (0.04)	0.24 (0.59)	0.29 (0.71)			
5										.02 (.06)	.02 (.06)	.02 (.06)
Totals	0.121 (0.292)	0.062 (0.154)	0.005 (0.013)	0.13 (0.31)	0.08 (0.20)	0 (0)	0.11 (0.26)	0.33 (0.81)	0.37 (0.91)	**.02 (.06)**	**.02 (.06)**	**.02 (.06)**

3.4.2 Summary of Potential Wetland Impacts

Within Segment 1, three alternatives were evaluated, impacting Wetlands 1A and 1B. The left alternative would impact the greatest amount of wetlands [0.121 ha (0.292 ac)] and the right alternative would impact the least [0.005 ha (0.013 ac)]. Within the right alternative, no impacts to Wetland 2 would occur.

Within Segment 2, three alternatives were evaluated, impacting Wetland 2. The left alternative would have the greatest amount of impacts with 0.13 ha (0.31 ac) and the right would have no impacts.

Within Segment 3, three alternatives were evaluated, impacting Wetlands 3 and 4. The right alternative, in this instance, would impact the greatest amount of wetlands [0.37 ha (0.91 ac)] and the left alternative would impact the least [0.11 ha (0.26 ac)].

Within Segment 5, three alternatives were also evaluated, impacting Wetland 5. All three alternatives would impact Wetland 5 each one would result in a total loss of the wetland 0.02 ha (0.06 ac).

As indicated previously, all wetlands examined within the project corridor would be considered low quality and urban in nature. The wetlands evaluated exhibited WRAP scores of less than 0.35 which indicate a disturbed system. These wetlands have little to no wildlife or habitat value.

4.0 CONCEPTUAL MITIGATION ALTERNATIVES

The minimal potential wetland impact association with this project will have a negligible effect on wildlife habitat and hydrological functions. The project team has studied various options to reduce wetland impacts to the maximum extent practicable. Options considered include various typical section alternatives, alignment alternatives, and minimization of additional ROW acquisition. The build alternatives under consideration entail wetland impacts; however, there is no opportunity to completely avoid wetland resources.

Mitigation polices have been established by the USACOE, the Florida Department of Environmental Protection (FDEP), and the Water Management Districts. Options for mitigating the loss of wetlands include mitigation banking, upland and/or wetland preservation, wetland restoration, enhancement, and creation. Also, in accordance with recently passed legislation another mitigation option is available to the FDOT. Mitigation in the form of a transfer of funds to the FDEP at $79,837 (FY 2000/2001) per acre of impact is also available. These funds are to be used to finance mitigation programs. Although this mitigation policy is acceptable to the State of Florida, it is not currently approved by the Federal agency (USACOE).

Mitigation banking requires the purchase of credits from the operating entity of a permitted mitigation bank. The bank's mitigation service area (MSA) normally must include the proposed project. However, mitigation for linear projects and projects with less than 0.20 hectares (0.5 acre) of impact can be accomplished through banking, regardless of the MSA, when: 1) the mitigation bank will

offset the adverse impacts of the project, and 2) on-site mitigation opportunities are not expected to have ecological value. The number of credits required to offset adverse impacts is determined during the permitting process.

Wetland restoration entails restoring hydrology and perhaps revegetating an area where normal wetland hydrologic and wildlife habitat function have been altered due to previous disturbance. Enhancement activities involve distinct improvement to an existing wetland and often entail the eradication of exotic and nuisance species, or removal of unnatural topography (spoil and fills). Wetland creation requires that upland areas be excavated (or flooded) to create wetlands by establishing appropriate hydrology. Hydrophytic vegetation planting efforts are usually conducted in conjunction with excavation or rehydration. Mitigation plans that include wetland restoration, enhancement, or creation also require monitoring and maintenance, typically for a five-year period.

Based on these considerations it is recommend that mitigation, if necessary, be accomplished through transfer of funds to the FDEP. This will be explored further during the final design phases of the project. At that time, all appropriate regulatory agencies will be contacted to discuss required mitigation and to preform on site investigations, if necessary.

5.0 PERMITTING REQUIREMENTS AND COORDINATION

Several agencies regulate wetlands within the project study area. These agencies include the USACOE and the SWFWMD. Other agencies, including the USFWS, the U.S. Environmental Protection Agency (USEPA), and the FFWCC, review and comment on wetland permitting. It is currently anticipated the following permits will be required for this project:

Environmental Resource Permit	SWFWMD

Section 404 Dredge and Fill Permit USACOE

National Pollutant Discharge Elimination System Permit USEPA

The FDOT initiated early project coordination on July 23, 1999, by distribution of an Advance Notification (AN) package to the Florida State Clearinghouse, Office of the Governor, Tallahassee, Florida in accordance with Executive Order 83-150. The AN package and responses received from reviewing agencies pertinent to potential wetland impacts are provided in Appendix C. Additional coordination of the project will be accomplished through the submittal of this document to the appropriate regulatory agencies.

6.0 CONCLUSIONS AND RECOMMENDATIONS

During the course of the US 98 Bypass PD&E Study, assessments of wetland and environmental resources within the project corridor were conducted. The primary goal of these tasks was to identify resources that occur within the proposed right-of-way. This information will aid the project engineers in designating a preferred alignment alternative that will minimize environmental impacts within the project corridor to the greatest extent practicable. Five wetland sites were identified in the project corridor that have the potential to be affected by the proposed improvements.

Based on this Wetland Evaluation it has been determined that there is no practicable alternative to avoiding wetland impacts. The estimated direct impacts range from 0.135 ha (0.333 ac) using a right alignment in Segments 1 and 2, a left alignment in Segment 3 and any alignment in Segment 5 to 0.641 ha (1.572 ac) using a left alignment in Segments 1and 2, a right alignment in Segment 3 and any alignment in Segment 5. All measures to avoid and minimize impacts to wetlands have been utilized to the extent practicable. These measures include evaluating typical section and alignment alternatives that minimize wetland impacts.

Throughout the PD&E Study and into the subsequent design and construction phases of this project, the FDOT will continue coordination with the appropriate regulatory and review agencies. This coordination will include formally coordinating the proposed wetland impacts through the distribution of this report and arranging field reviews, as appropriate, of the proposed impact areas.

Based on the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to the wetlands which may result from such use.

7.0 REFERENCES

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APPENDICES

APPENDIX A

PHOTOGRAPHS OF WETLAND SITES

APPENDIX B

WRAP EVALUATION DATA AND SUMMARY SHEETS

APPENDIX C

ADVANCE NOTIFICATION AND RESPONSES

APPENDIX D

CORRESPONDENCE AND COORDINATION

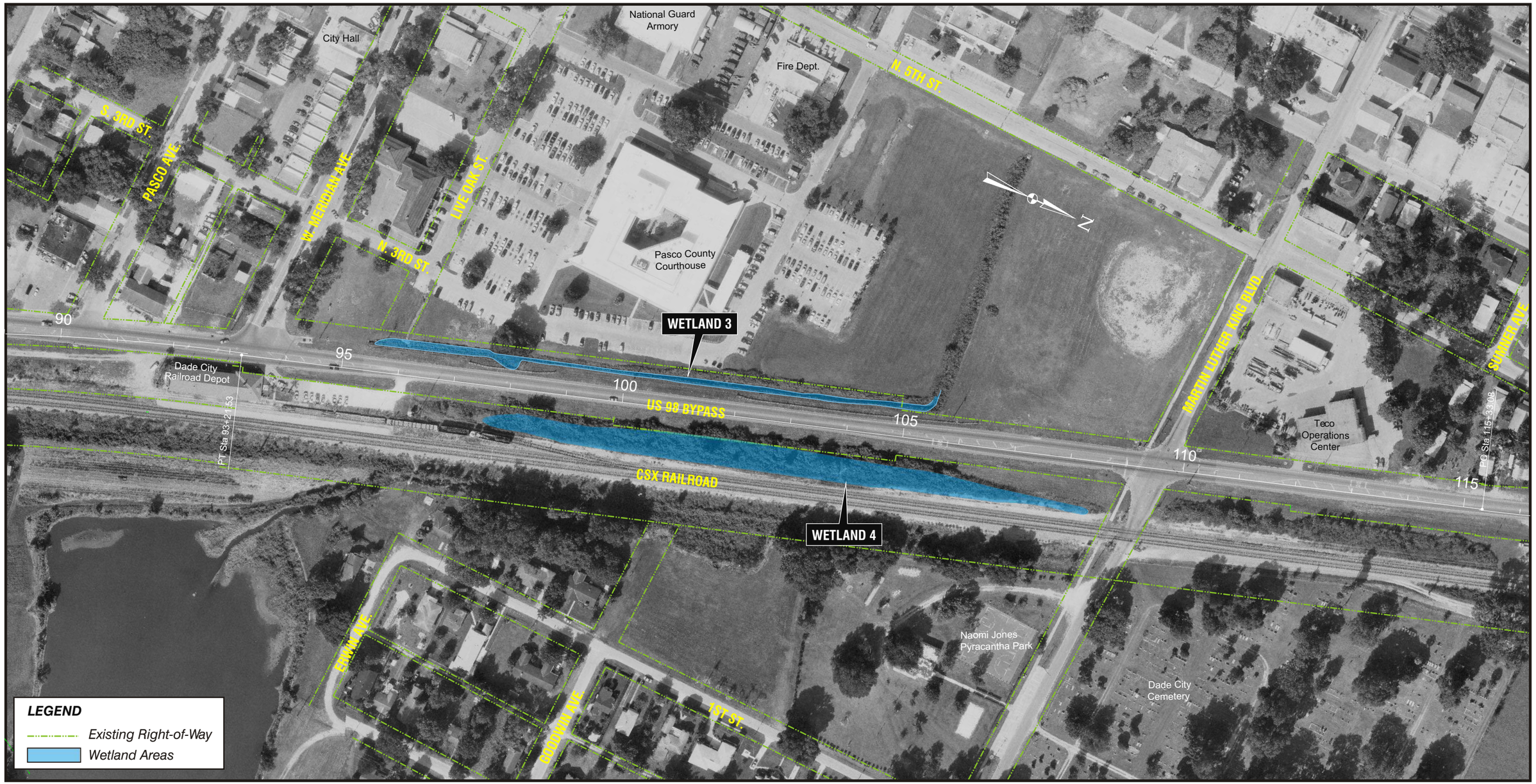
APPENDIX E

PROJECT AERIAL PHOTOGRAPHY

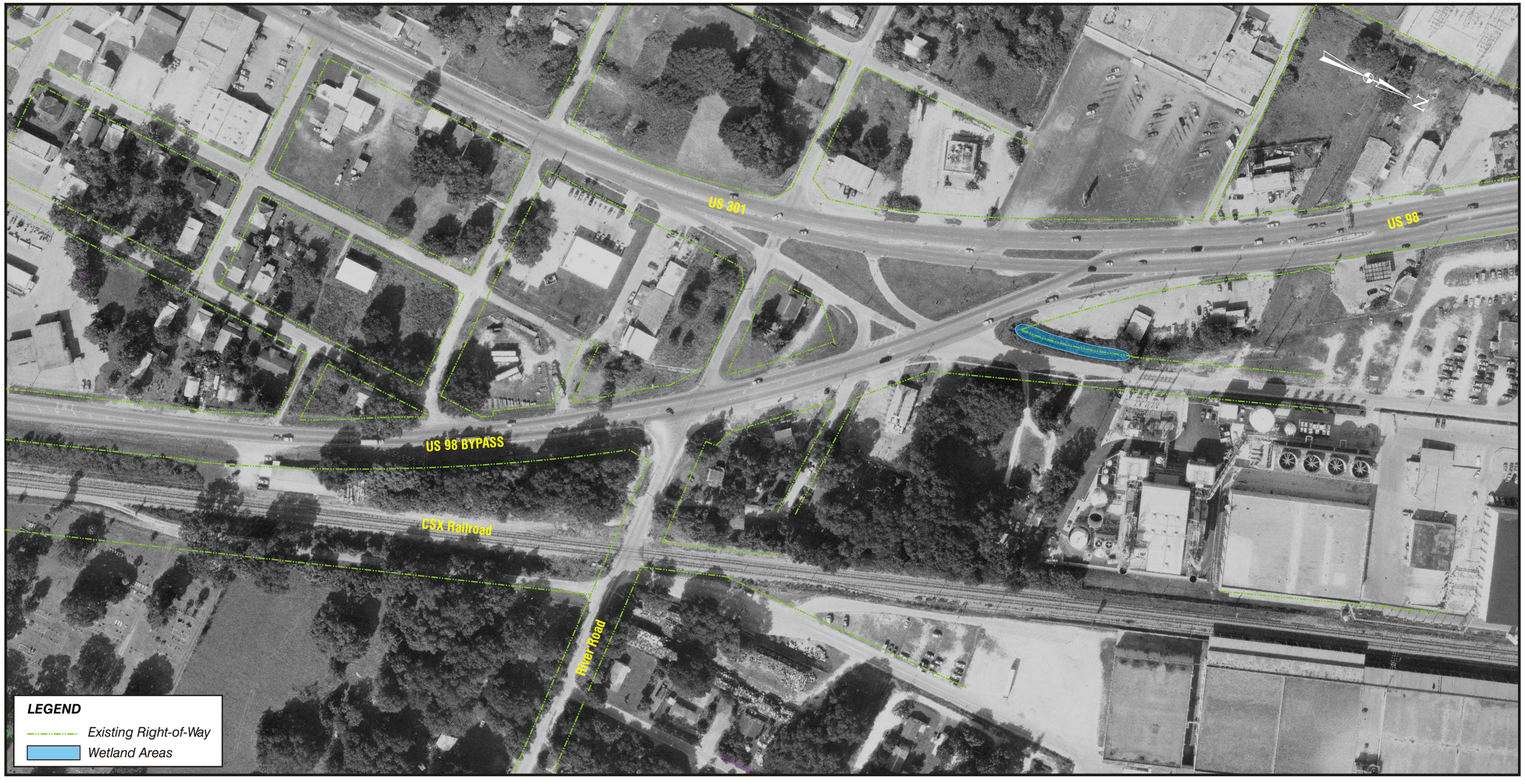
U.S. 98 DADE CITY BYPASS PD&E STUDY

Dade City, Pasco County WPI Segment No. 256423 1 Federal Aid Project Number 3112-017P		**WETLAND AREAS 1A, 1B, AND 2**	Figure E-1

U.S. 98 DADE CITY BYPASS PD&E STUDY



Dade City, Pasco County WPI Segment No. 256423 1 Federal Aid Project Number 3112-017P		**WETLAND AREAS 3 AND 4**	Figure E-2



Dade City, Pasco County WPI Segment No. 256423 1 Federal Aid Project Number 3112-017P		**WETLAND AREA 5**	Figure E-3

US HIGHWAY 98
DADE CITY
PD&E Study

Florida Department of Transportation
Project Development and Environment (PD&E) Study

Wetland Evaluation Report

U.S. 98 DADE CITY BYPASS

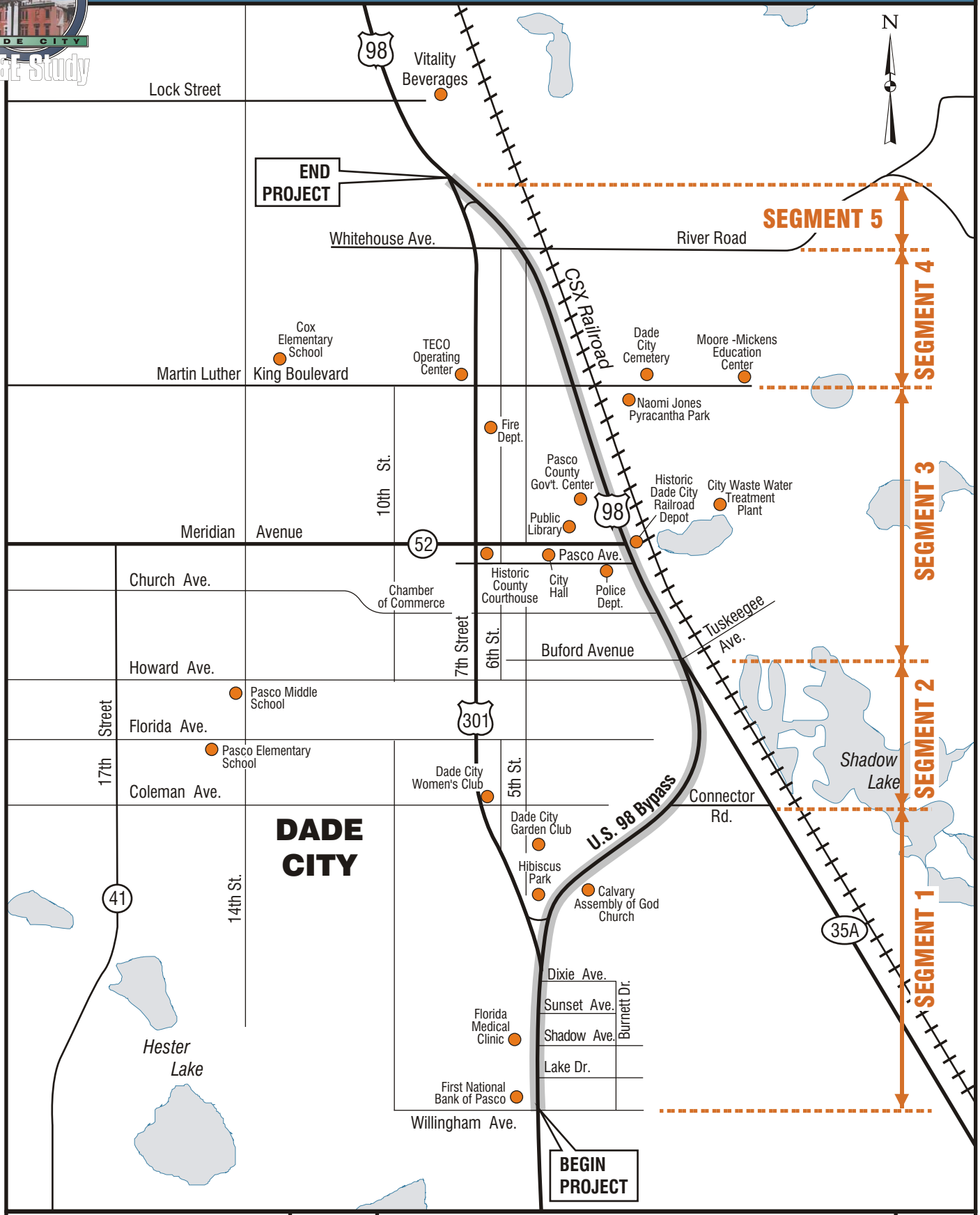
From U.S. 301 South to U.S. 301 North
Dade City, Pasco County

W.P.I. Segment No. 256423 1
Federal-Aid Project No. 3112-017P

Florida Department of Transportation
District Seven
Tampa, Florida

September 2000

U.S. 98 DADE CITY BYPASS PD&E STUDY



Dade City, Pasco County
WPI Segment No. 256423 1
Federal Aid Project Number 3112-017P

PROJECT LOCATION MAP

Figure 1

U.S. 98 DADE CITY BYPASS PD&E STUDY

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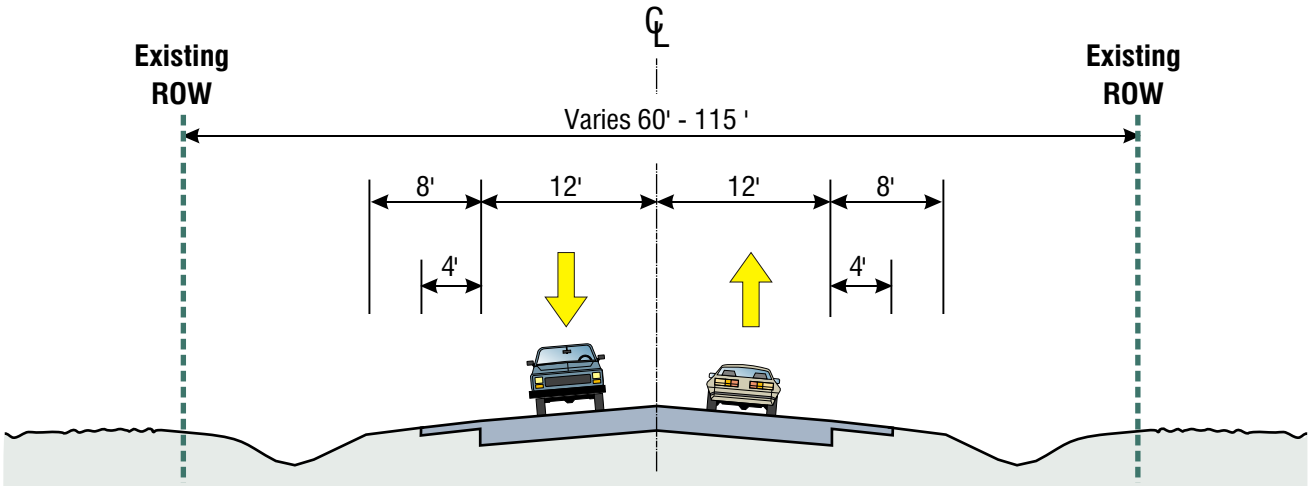
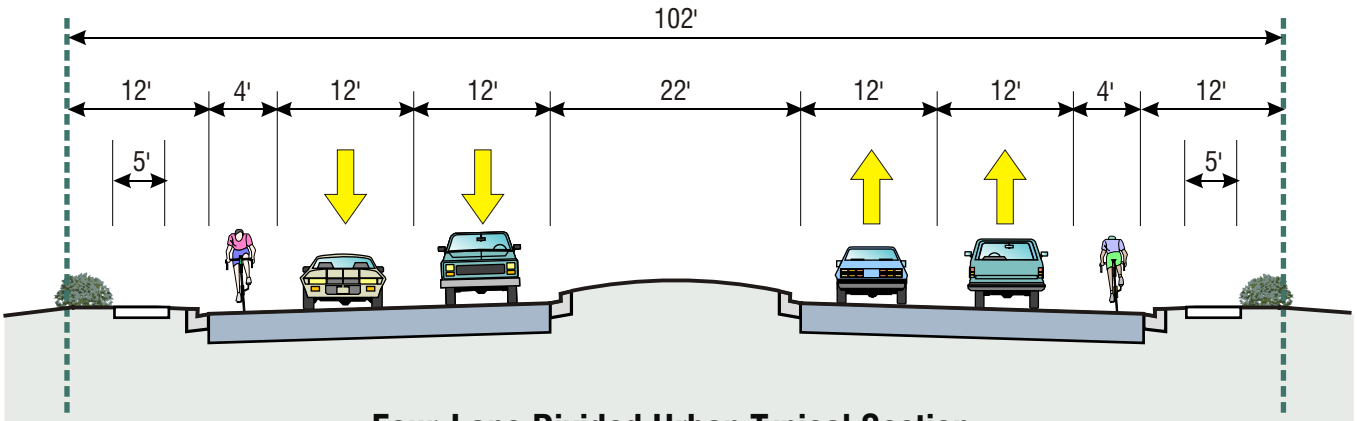
Dade City, Pasco County WPI Segment No. 256423 1 Federal Aid Project Number 3112-017P		**PROJECT AERIAL MAP**	Figure 2

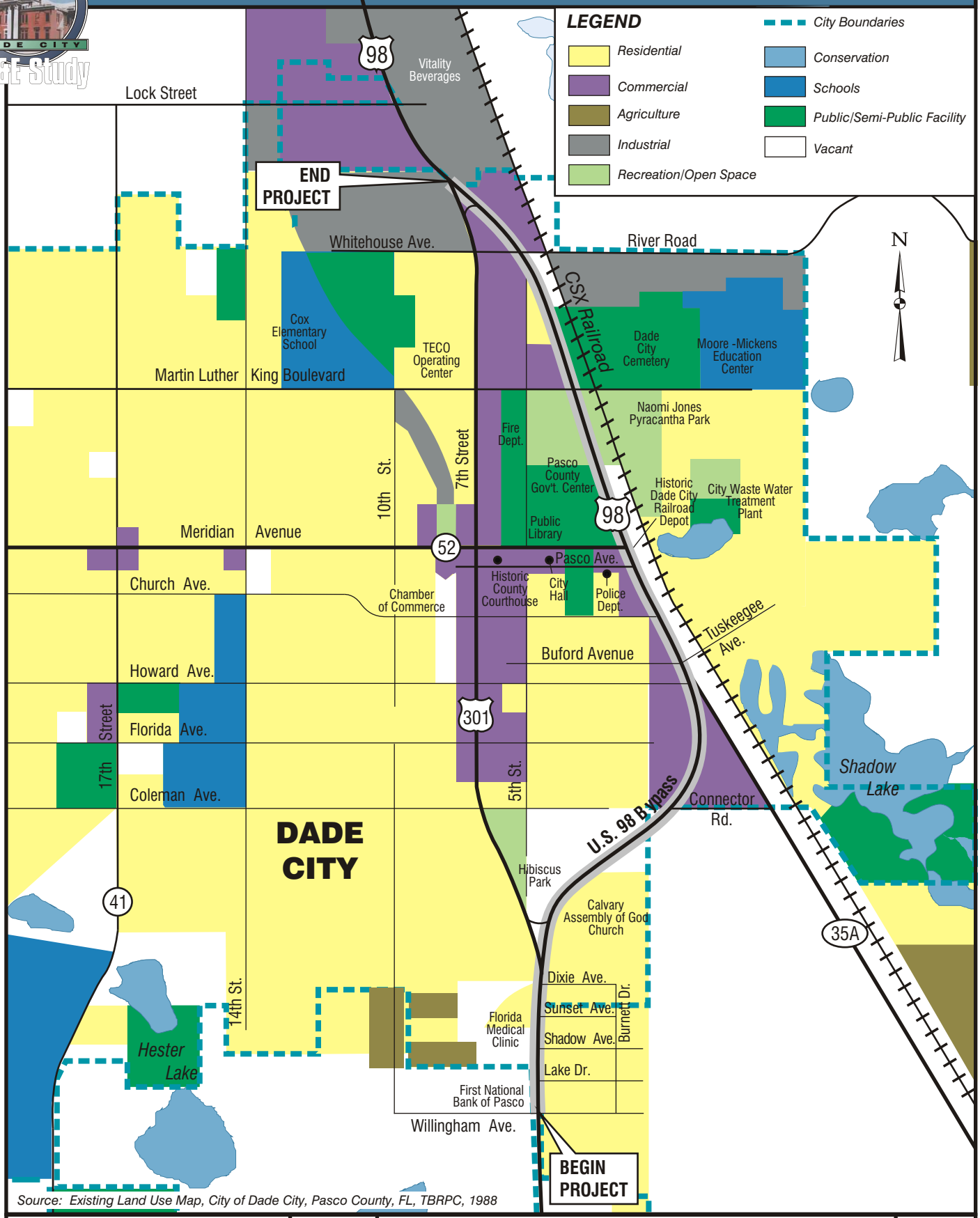


2-Lane Undivided Rural Typical Section



Four-Lane Divided Urban Typical Section

U.S. 98 DADE CITY BYPASS PD&E STUDY



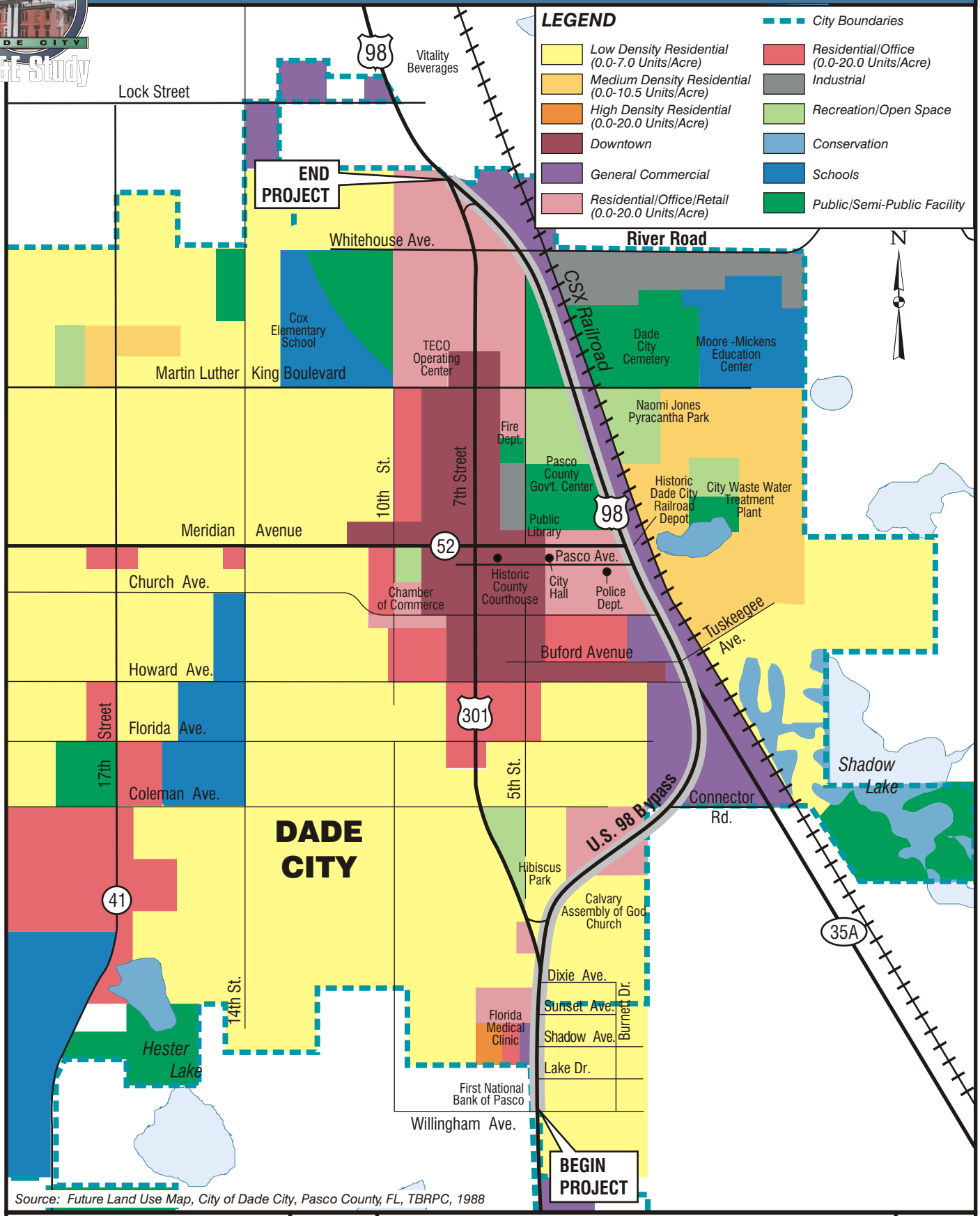
Source: Existing Land Use Map, City of Dade City, Pasco County, FL, TBRPC, 1988

Dade City, Pasco County
WPI Segment No. 256423 1
Federal Aid Project Number 3112-017P

EXISTING LAND USE MAP

Figure 4

U.S. 98 DADE CITY BYPASS PD&E STUDY

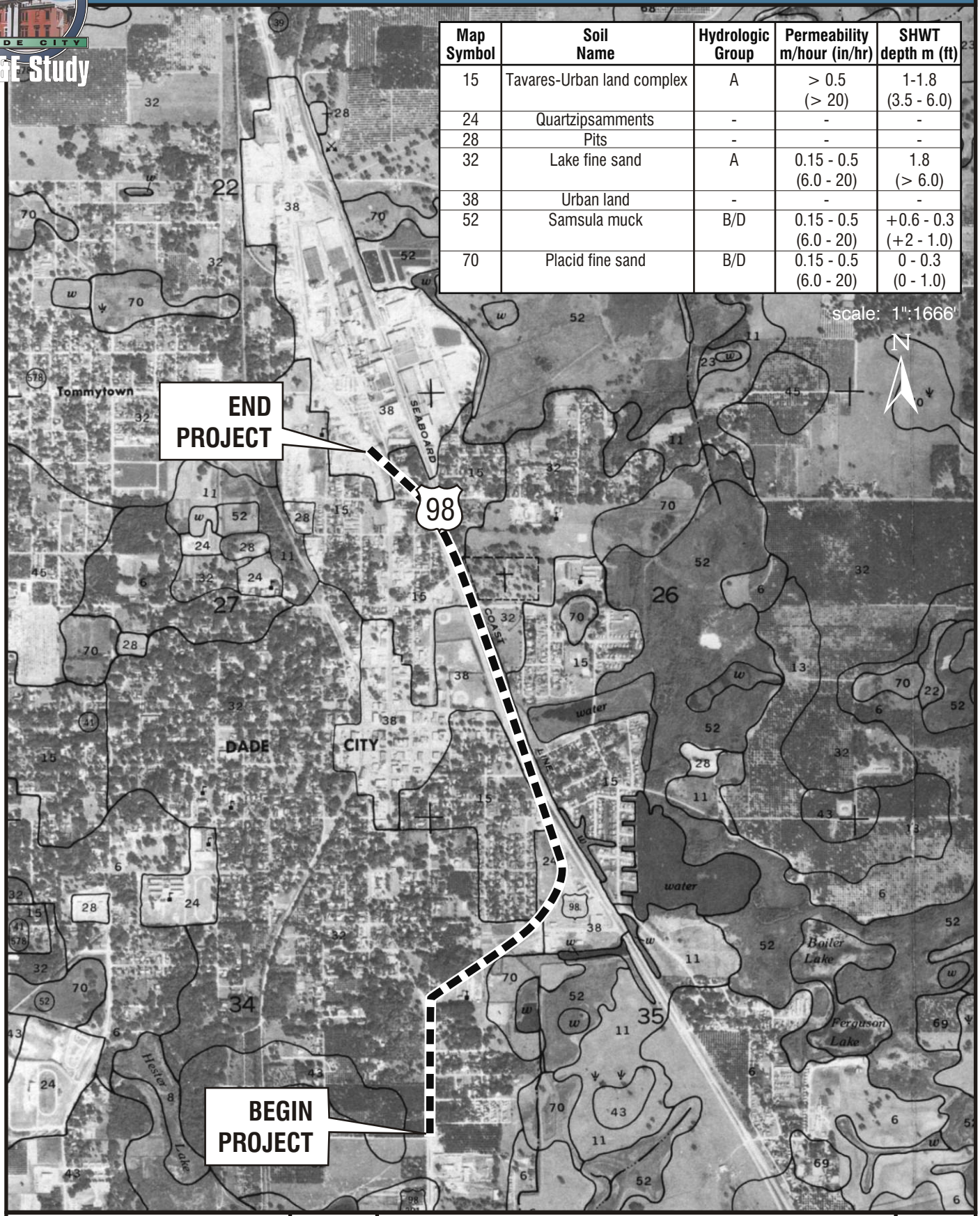


Source: Future Land Use Map, City of Dade City, Pasco County, FL, TBRPC, 1988

Dade City, Pasco County WPI Segment No. 256423 1 Federal Aid Project Number 3112-017P	**FUTURE LAND USE MAP**	Figure 5

U.S. 98 DADE CITY BYPASS PD&E STUDY

Map Symbol	Soil Name	Hydrologic Group	Permeability m/hour (in/hr)	SHWT depth m (ft)
15	Tavares-Urban land complex	A	> 0.5 (> 20)	1-1.8 (3.5 - 6.0)
24	Quartzipsamments	-	-	-
28	Pits	-	-	-
32	Lake fine sand	A	0.15 - 0.5 (6.0 - 20)	1.8 (> 6.0)
38	Urban land	-	-	-
52	Samsula muck	B/D	0.15 - 0.5 (6.0 - 20)	+0.6 - 0.3 (+2 - 1.0)
70	Placid fine sand	B/D	0.15 - 0.5 (6.0 - 20)	0 - 0.3 (0 - 1.0)

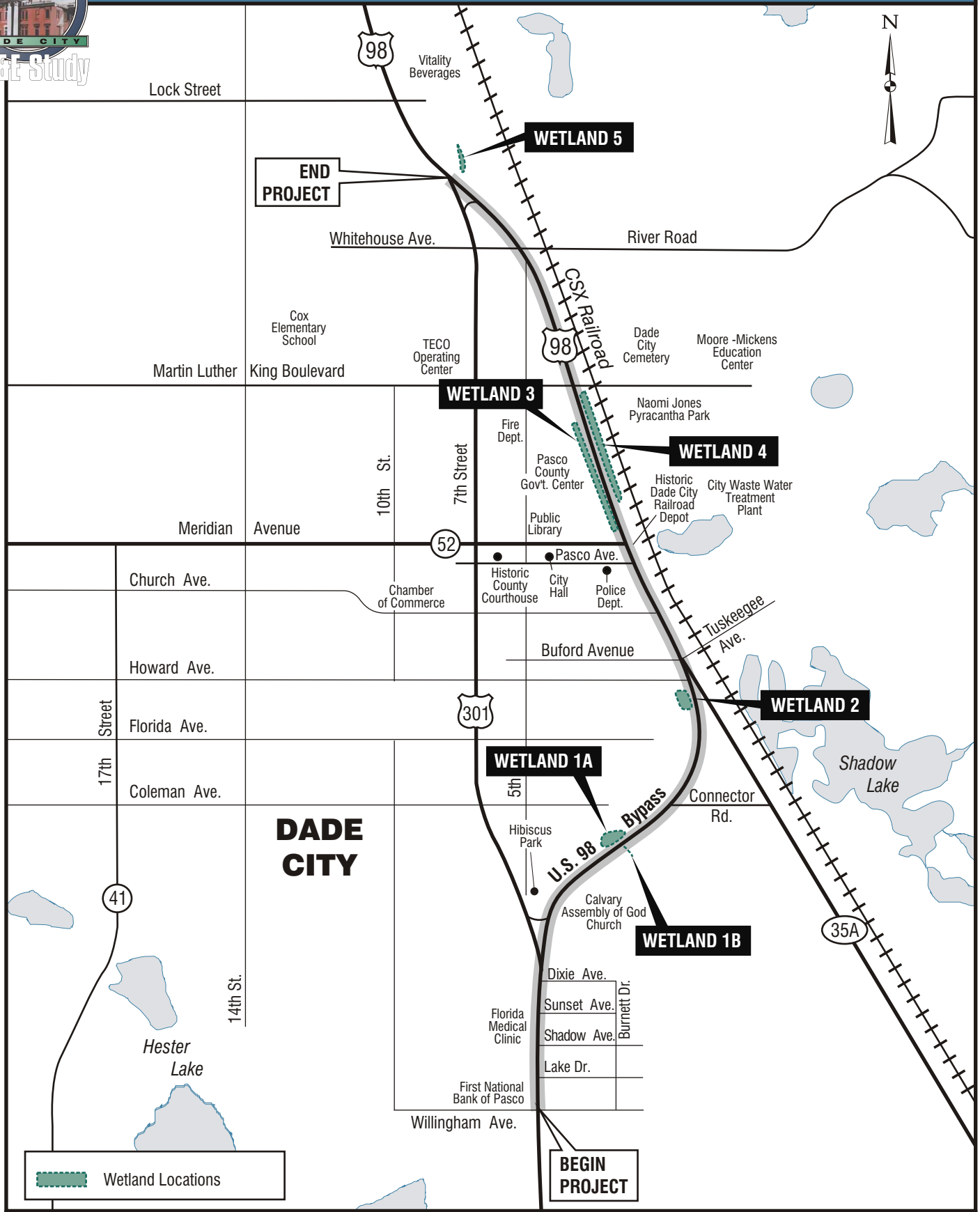


Dade City, Pasco County
WPI Segment No. 256423 1
Federal Aid Project Number 3112-017P

SOILS MAP

Figure 6

U.S. 98 DADE CITY BYPASS PD&E STUDY



Dade City, Pasco County
WPI Segment No. 256423 1
Federal Aid Project Number 3112-017P

WETLAND LOCATION MAP

Figure 7