Chapter 4

Impacts

Environmental Assessment

LPGA BLVD EXTENSION PD&E STUDY

4. Impacts

This chapter summarizes the potential effects on the social, cultural, and natural environment that would result from the construction and operation of the LPGA Boulevard Extension project in comparison to the No Build Alternative. Potential impacts were assessed for the Preferred Alternative. The impacts are based on planning efforts to date and use currently available information.

4.1 Social and Economic Impacts

4.1.1 Community Services

Community facilities help provide the social service needs of the community and generally include educational facilities, day care centers, churches and cemeteries, social service agencies, community centers, government facilities, police/fire protection, and parks and recreational areas. However, given the rural character of the project study area, no impacts to community services are anticipated as a result of this project, because no community services exist along the Preferred Alternative.

4.1.2 Activity Centers

The future extension of LPGA Boulevard is proposed to occur through undeveloped property. The only existing activity center located in the immediate project area is the Tomoka Farms Landfill that is operated by the Volusia County Solid Waste Department. The proposed improvements are expected to traverse property that is part of the existing landfill operation; therefore, close coordination with landfill personnel has been conducted throughout this project to minimize impact to landfill operations. The First Baptist Church of Daytona Beach has purchased property north of I-4 and south of US 92 to relocate their existing facility. The project study area will also cross the church property and close coordination with church representatives has been conducted regarding site planning and potential alignment locations.

Other activity centers that are in close proximity to the project study area include:

- Daytona Beach Municipal Stadium – located on LPGA Boulevard approximately 1 mile north of US 92. This is a football stadium primarily utilized by local high schools.
- US Tennis Association (USTA) Complex – located on LPGA Boulevard approximately 2 miles north of US 92. This complex has been identified as a park by both the City of Daytona Beach and Volusia County.
- Sovereign Grace Church; 2421 Tomoka Farms Road; Port Orange, FL – located just over 2 miles south of the CR 415 (Tomoka Farms Road)/Shunz Road intersection is the closest church to the project study area.

- South Haven Christian Church; 2430 Tomoka Farms Road; Port Orange, FL – located just south of the Sovereign Grace Church.

Each of these facilities will not be directly impacted by the project and will benefit from the enhanced accessibility provided by this improvement.

4.1.3 Community Cohesion

This section focuses on the impacts associated with the Preferred Alternative on the adjacent neighborhoods and community at large. Community cohesion impacts include the effects of splitting neighborhoods, social isolation, facilitating new development, urban renewal, joint land use, changes in property values, increased neighborhood or community access, change in quality of life, and separation of residences from community facilities.

Impacts to community cohesion are not anticipated as a result of this project, because no relocations are involved. Since no neighborhoods will be divided, and no isolation of minority or ethnic groups and no separation of residences from adjacent community facilities will occur, no impacts to community cohesion are expected due to the proposed improvements.

This project has been developed in accordance with the Civil Rights Act of 1964, as amended by the Civil Rights Act of 1968. Title VI of the Civil Rights Act of 1964 provides that no person shall on the ground of race, color, age, religion, sex, national origin, marital status, handicap, or family composition be excluded from participation in, or be denied the benefit of, or be otherwise subject to discrimination under any program of the Federal, State, or local government. Title VIII of the Civil Rights Act of 1968 guarantees each person equal opportunity in housing.

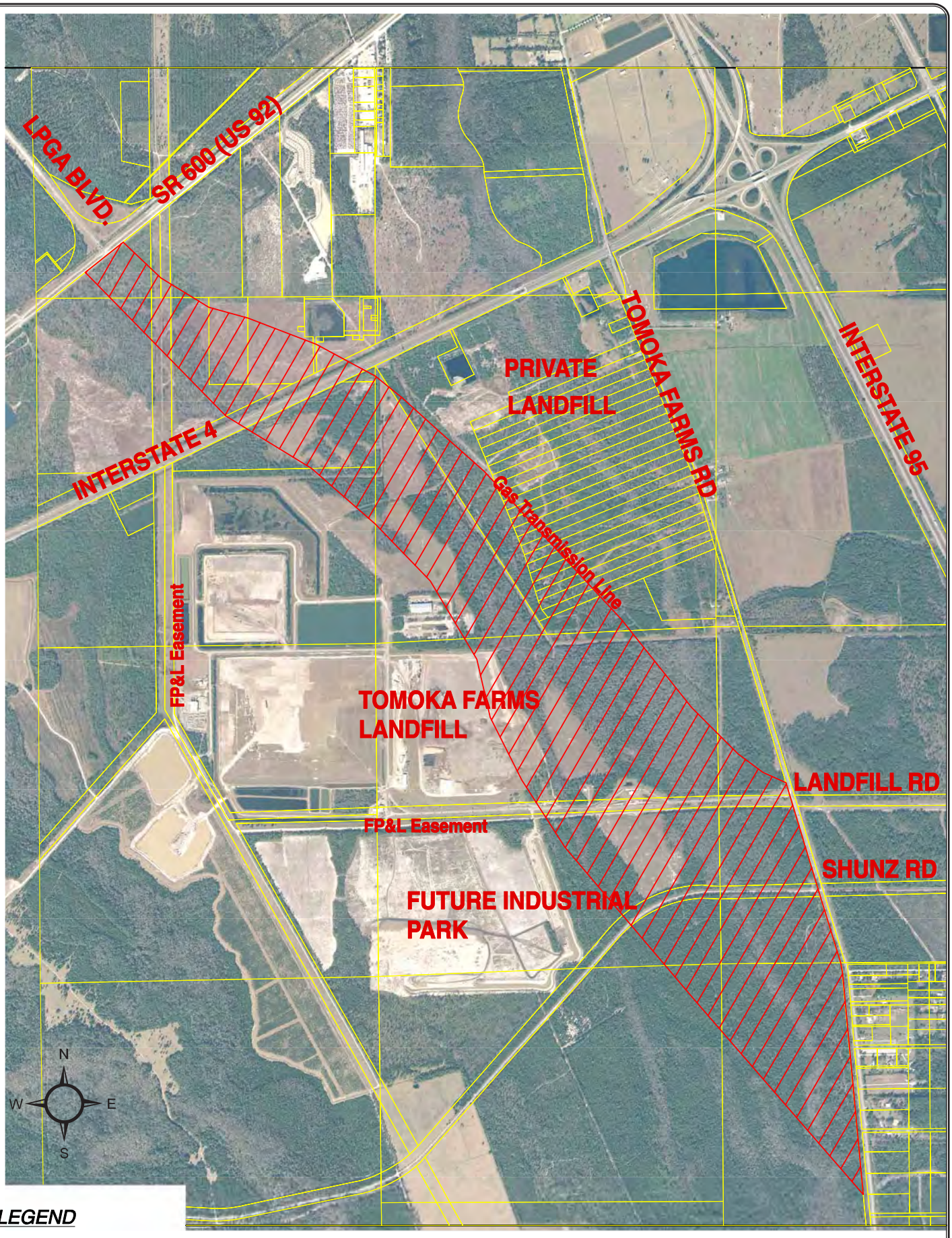
4.1.4 Land Uses

Existing Land Use

Existing land use information was collected using aerial photography (May 5, 2004), geographic information system (GIS) information provided by Volusia County and field reconnaissance.

As presented in Figure 4-1, the project corridor is characterized primarily as undeveloped public lands. In addition, there is a mixture of conservation areas largely dominated by large wetland systems, floodplain, commercial, and industrial land uses. Near the proposed corridor is an existing landfill operation, the Tomoka Farms Landfill owned and operated by Volusia County.

The Tomoka Farms Landfill is the primary existing land use within the study area. The characteristics of the site were obtained from the *Tomoka Farms Industrial Park Traffic Impact Analysis*, prepared for Volusia County by WCG Neel-Schaffer (August 2003). The landfill site includes: a closed 112-acre Class I cell, an active 40-acre Class I cell, preparation of a new 42-acre Class I cell, an active 150-acre Class III area with a wood waste recycling facility, a methane gas treatment facility and power plant, the G.E.L. Corp Recycling facility, and a sludge plant that processes solid waste.



EXISTING LAND USE

FIGURE 4-1

A small area of low-density residential and agricultural related land use exists at the southern end of the study area along CR 415 (Tomoka Farms Road). Some of the larger property owners include the First Baptist Church of Daytona Beach, Volusia County, proposed Indigo Development of Regional Impact (DRI), Consolidated Tomoka Development (also referred to as the LPGA DRI in the City of Daytona Beach) large-scale residential community with 18-hole golf course, City of Port Orange, and the Port Orange Plantation and Coquina Cove development (formerly known as the Coraci PUD).

Future Land Use

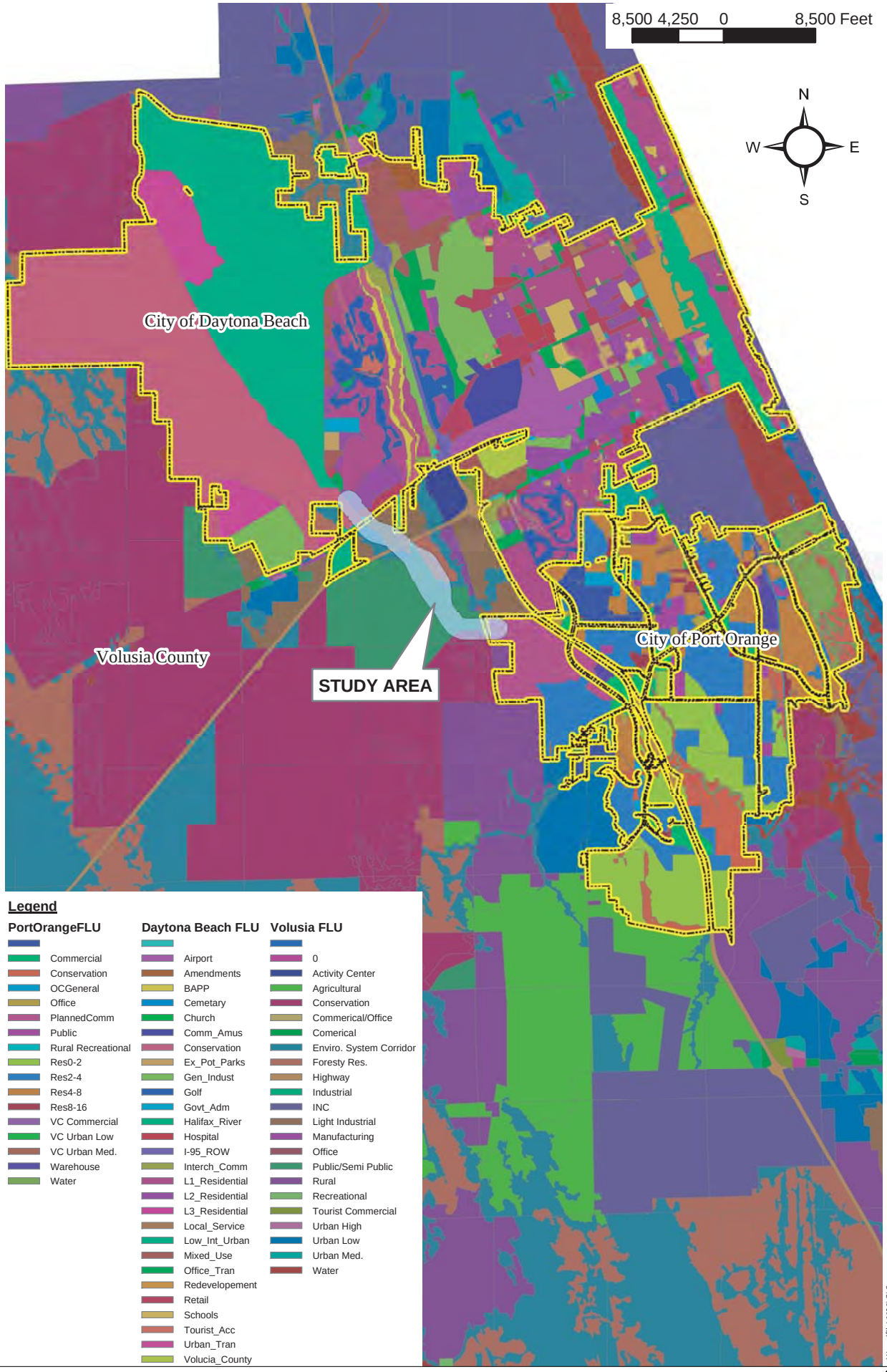
Figure 4-2 presents the future land use designations for this area. Future land use data was collected based on information contained within the Land Use elements of the comprehensive plans for Volusia County, the City of Daytona Beach and the City of Port Orange. As previously discussed in Section 2.6.2, several major developments are proposed within the project study area. Figure 2-1 in Chapter 2, identified these developments. Brief descriptions are provided below.

Port Orange Plantation and Coquina Cove (formerly Coraci PUD) – The Coraci property is currently under active development. Two phases have been approved. The first, Port Orange Plantation Phase I, is under construction, and includes 90 single-family residential lots. This phase is almost complete as of July 2005. The other, Coquina Cove Phase I, includes 332 single-family and duplex residential lots. The second phase is just commencing construction (July 2005). For the two currently approved phases, the estimated trip generation will add approximately 3,500 to 4,000 daily trips to the network. The City of Port Orange is also reviewing final plans for Port Orange Plantation Phase II, which would include 104 single-family lots. However, Phase II is currently on hold awaiting solutions to the anticipated traffic impacts with the developer. There are several other phases of Port Orange Plantation and Coquina Cove on the drawing board. With Port Orange Plantation, another 210 single-family units and 571 multi-family units are proposed. For Coquina Cove, another 700 units are proposed.

Landfill Industrial Park – The Landfill Industrial Park is currently being developed by Volusia County. The initial site clearing has been completed and the next phase of site work will begin construction later in 2005 with a completion date scheduled for October 2006.

First Baptist Church of Daytona Beach – This project is located north of I-4 and west of CR 415. The church site plan identifies access as being provided via the proposed LPGA Boulevard Extension and CR 415 (Tomoka Farms Road). The new access provided across the Tomoka River to CR 415 (Tomoka Farms Road) has been already been permitted by the St. Johns River Water Management District (SJRWMD).

"Daytona West" – The property that is within the city limits of Daytona Beach located north of US 92 and west of the existing LPGA Boulevard is owned by Consolidated Tomoka. It has been identified in the *City of Daytona Beach Comprehensive Plan* as low-density urban. The City has applied to the Department of Community Affairs (DCA) to change and approve the density of development for approximately 2,000 acres of this property to be increased from one dwelling unit per acre to two dwelling units per acre. This process has been under review by DCA since March 2005. This change in density would generate an additional 19,750 daily trips to the network.



FUTURE LAND USE

FIGURE 4-2

Consolidated Tomoka Development – Based on the LPGA DRI Phase 2 Monitoring and Modeling Methodology (March 14, 2005), 461 residential units, 69,000 square feet of office, 40,500 square feet of manufacturing, 6,560 square feet of convenience market, 153,340 square feet of new car sales, 93,752 square feet of medical office, 65,700 square feet of church, and 36 holes of golf course have been approved. The remaining development plan is proposing to add 7,206 residential units, 840,891 square feet of office, 598,840 square feet of retail, 450,200 square feet of manufacturing, 8,522 square feet of fast-food restaurant, 25,390 square feet of pharmacy, 20,622 square feet of bank, 71,904 square feet of new car sales, 20,000 square feet of medical office, and 20,000 square feet of nursing home. Since the Phase 2 Monitoring and Modeling Report are currently being prepared, there is no estimate available for number of additional – trips on the roadway network.

These developments indicate that future plans for local development have been identified and are proceeding irregardless of this planned roadway extension. Therefore, the proposed LPGA Boulevard Extension would accommodate currently approved and planned intensive development surrounding the project corridor, rather than alter existing and/or future land use patterns.

4.1.5 Utilities and Railroads

Existing utilities within the study area include overhead electrical distribution and transmission lines, gas lines, water mains, sanitary sewer pipes, overhead telephone lines, and fiber optic cables. Major utilities were assessed as part of this analysis. Minor utilities such as water and electrical lines serving individual buildings, have been excluded.

Due to the undeveloped and rural character of the project corridor, significant utility impacts are not anticipated. The potential involvement with the utilities is briefly discussed below. It should be noted that all or some of these utilities may require some adjustments to accommodate the proposed improvements.

Utilities

Florida Power and Light (FP&L) – FP&L has an existing 23KV overhead distribution line along the south side of US 92 at the existing terminus of the existing LPGA Boulevard. Along Landfill Road, there are three overhead circuits (one 240 KV transmission and two 23 KV distribution). Along the south side of Landfill Road, there is a 23KV overhead distribution line on poles. Another 23KV overhead distribution line on poles runs along the west side of CR 415 (Tomoka Farms Road). Finally, FP&L has a 300-foot easement with four overhead transmission lines (one 115 KV and three 240 KV). However, minor impacts are anticipated to occur as a result of the proposed improvements.

WilTel Communications – WilTel Communications has an existing buried fiber optic cable line and three ducts along the west side of CR 415 (Tomoka Farms Road) through the project study limits. The facilities have approximately 40 inches of cover. However, minor impacts are anticipated to occur as a result of the proposed improvements.

BrightHouse Networks – BrightHouse Networks has both aerial and buried fiber optic lines along the north side of US 92 and then along the east and west sides of existing LPGA Boulevard heading north. In addition, BrightHouse has an overhead cable line along the west side of CR 415 (Tomoka Farms Road) from just north of Halifax Drive, running south from this point. However, no impacts are anticipated to occur as a result of the proposed improvements.

FPL Fibernet – FPL Fibernet has direct burial fiber optic facilities in the existing FP&L Transmission easement which crosses I-4 approximately 1.3 miles west of I-95. However, minor impacts are anticipated to occur which may result in a need to bury the existing 18 strand fiber optic cable deeper in the FPL easement that will be crossed.

Florida Gas Transmission – Florida Gas Transmission has an existing 4-inch gas line which runs through the study area west of CR 415 (Tomoka Farms Road) to a point just north of Landfill Road where it crosses CR 415 and continues on a southeastward alignment. However, no impacts are anticipated to occur as a result of the proposed improvements.

TECO-Peoples Gas – TECO-Peoples Gas has an existing 4-inch steel gas line running along the south side of US 92 approximately 28-feet south of the centerline of the eastbound lanes. However, minor impacts are anticipated to occur as a result of the proposed improvements.

AT&T – AT&T (Long Distance) has an existing conduit system with high capacity fiber optic cable along the south side of US 92 from west of the project limits to the LPGA Boulevard intersection and along the north side of US 92 from the east to the LPGA Boulevard intersection, where it turns north and runs along the east side of existing LPGA Boulevard. However, no impacts are anticipated to occur as a result of the proposed improvements.

BellSouth – BellSouth has existing aerial and buried facilities along Shunz Road and along the west side of CR 415 (Tomoka Farms Road). However, no impacts are anticipated to occur as a result of the proposed improvements.

City of Daytona Beach Water & Wastewater – The City of Daytona Beach provides water service to the landfill through a 20-inch water main which runs along the west side of the landfill, northward to US 92. The City owns an easement along Landfill Road and is proposing to extend the 20-inch water line from the landfill eastward along Landfill Road as development warrants. However, the timing of this construction and location of this future 20-inch water line are unknown at this time. Therefore, no impacts are anticipated to occur as a result of the proposed improvements.

City of Port Orange Water & Wastewater – The City of Port Orange has an existing 30-inch raw water main along the south side of Shunz Road, approximately six-feet south of the existing edge of pavement. The City recently installed a 24-inch reclaimed water line along the north side of Shunz Road, approximately 13 feet north of the existing edge of pavement. However, no impacts are anticipated to occur as a result of the proposed improvements.

Railroads

There are no railroad lines in operation within the project study area. Therefore, no impacts to railroad facilities and/or operations are expected to occur as a result of this project.

4.1.6 Relocations

Displacement results from right-of-way acquisition and requires permanent removal or relocation of existing land users. Right-of-way acquisition for the LPGA Boulevard Extension project would involve some partial or complete purchase of parcels of land. The FDOT, in conjunction with Volusia County, would acquire the right-of-way needed for the proposed project.

There are no relocations associated with this project. All land acquisitions required for the proposed roadway involve only the purchase of vacant lands and/or public lands currently owned by Volusia County and private property owners.

A total of 36 parcel acquisitions, or approximately 185 acres, are required for the proposed improvements. This equates to approximately 73 acres for roadway construction, 44 acres for stormwater ponds, and 68 acres for floodplain compensation storage ponds.

The proposed project, as presently conceived, will not displace any residences or businesses within the community. Should this change over the course of the project, the FDOT will carry out a Right-of-Way and Relocation Program in accordance with Florida Statute 339.09 and the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970 (Public Law 91-646 as amended by Public Law 100-17). The brochures which describe in detail the Department's The brochures which describe in detail the Department's Relocation Assistance Program and Right-of-Way Acquisition Program are: "*Your Relocation: Residential*", "*Your Relocation: Businesses, Farms and Nonprofit Organizations,*" "*Your Relocation: Signs,*" *and* "*The Real Estate Acquisition Process*." All of these brochures are distributed at all public hearings and made available upon request to any interested persons.

4.2 Cultural and Historical Resources

Section 106 of the National Historic Preservation Act (NHPA) of 1966 (Public Law 89-665, amended) as implemented by 36 CFR 800, Protection of Historic Properties, protects those properties that are listed or determined eligible for inclusion in the NRHP. In addition, Section 4(f) of the Department of Transportation Act of 1966, as amended (49 U.S.C. 303) protects historic and/or cultural resources of national, state, or local significance and other natural public features from conversion to highway use unless there is no prudent or feasible alternative.

A Cultural Resource Assessment Survey (CRAS) was prepared in accordance with Section 106, Section 4(f), Chapter 267 of the Florida Historical Resources Act, and Part 2, Chapter 12 (Archaeological and Historic Resources) of the FDOT's *Project Development and Environment (PD&E) Manual*. This investigation was conducted for the purpose of providing information to assist in the avoidance of National Register of Historic Places (NRHP)-listed or eligible properties or National Landmarks. The reconnaissance included all significant historic, architectural, archaeological, and cultural resources within the defined Area of Potential Effect (APE) for the project.

4.2.1 Archaeological and Historical

Background research, including a review of the Florida Master Site File (FMSF) and the NRHP, indicate that no previously recorded archaeological sites or historic resources are located within or adjacent to the LPGA Boulevard Extension PD&E Study project APE. A review of relevant site location information for environmentally similar areas within Volusia County and the surrounding region, as well as an examination of historical documents, indicate a low probability for the occurrence of pre-contact and historic period archaeological sites within the project study limits. Sites, if present, would most likely be small lithic and artifact scatters. As a result of field survey, no archaeological sites were discovered and no historic resources were identified within the project APE.

A Cultural Resource Assessment, conducted in accordance with the procedures contained in 36 CFR Part 800 and including background research and a field survey coordinated with the State Historic Preservation Officer (SHPO), was performed for the project. No archaeological or historical sites or properties were identified, nor are any expected to be encountered during subsequent project development. The Federal Highway Administration, after consultation with SHPO, has determined that no resources listed or eligible for listing on the NRHP would be impacted. The SHPO coordination letter is included in Appendix A. Further detailed information on the cultural resource evaluation can be obtained from the *Cultural Resource Assessment Survey* performed for this project.

4.2.2 Recreational/Parkland

In accordance with Section 4(f) of the U.S. Department of Transportation Act of 1966, as set forth in Title 49, USC, Section 1653(f), amended and codified in Title 49, Section 303, and expanded in Title 23, USC, Section 138, the project study area was evaluated for potential Section 4(f) resources and impacts.

Potential Section 4(f) resources are defined as parklands, public recreation areas, wildlife refuges and historic/archaeological sites of significance. A Section 4(f) use occurs when one of the following conditions is met:

1. A protected resource is permanently acquired for a transportation project;
2. A temporary use of the protected resource is considered adverse (i.e., preservation of the resource would be impeded); or
3. There is constructive use of the protected resource.

A determination on Section 4(f) applicability is determined by FHWA.

Based on a review of public parks, recreational facilities, historical/archeological sites, and wildlife refuges within the project study area, no potential Section 4(f) resources were identified. Other potential Section 4(f) sites that have been identified outside of the project study area include the Tiger Bay State Forest and the Volusia Conservation Corridor. It has been documented through email correspondence, maps, and in discussions with the Forestry Resource Administrator of the Florida Division of Forestry that the Tiger Bay State Forest is located outside of the project area and the two tracts within the Tiger Bay State Forest near the project area are described below.

- The Clark Bay Tract within the Tiger Bay State Forest is located six miles west of the project area and north of US 92. The southernmost extent of the Tiger Bay State Forest is located four miles west of the project area within the I-4 right-of-way.
- The proposed project is located southeast of the Rima Ridge Tract within Tiger Bay State Forest, which is located north of US 92.
- The designated Volusia Conservation Corridor is located approximately five miles southwest and outside of the project study area.

Please refer to Appendix D for a location map identifying the two Tiger Bay sites and Appendix I for a location map identifying the Volusia Conservation Corridor in reference to our project.

4.3 Natural and Physical Impacts

4.3.1 Pedestrian/Bicycle Facilities

The *Volusia County Comprehensive Plan* states that, whenever possible, pedestrian facilities should be provided in area where intense development is proposed. This includes areas of pedestrian generators where residential developments, shopping and office complexes, etc. are proposed. In addition, sidewalks should be provided where gaps on pedestrian facilities exist or to connect pedestrians with other modes of transportation.

As previously discussed in Section 2.7.2, a 12-foot, wide multi-use trail is being proposed as part of the Madeline Avenue/Shunz Road Extension project being conducted by Volusia County. The inclusion of this trail is consistent with Chapter 2, Section G of the *Volusia County Comprehensive Plan*.

As part of the proposed improvements and in compliance with Section 109(n) of 23 USC, the LPGA Boulevard Extension will include shoulders, which may be used for bicycle traffic. The paved shoulders will meet the design criteria of the current *FDOT's Roadway Plans Preparation Manual* and *Bicycle Facilities Planning and Design Handbook*. In addition, the proposed project will also provide a 12-foot paved multi-use trail for pedestrian and bicycle traffic along the north/east side of the proposed roadway through the entire length of the corridor. This new multi-use trail would ultimately connect with the trail being planned along the Madeline Avenue/Shunz Road Extension project.

Although the LPGA Boulevard Extension project is currently not included in the *Volusia County Trails Plan* (adopted December 16, 2004), the County has stated that it will be incorporated into the trail network during the next plan update. This plan does show the existing section of LPGA Boulevard north of US 92 to be designated as an "Enhanced Bicycle/Pedestrian Corridor." Refer to Figure 3-2, as previously presented, for an illustration of the proposed LPGA Boulevard Extension typical section with multi-use trail.

4.3.2 Air Quality

An air quality analysis was performed to assess the potential impacts of the proposed project. The study was conducted in accordance with Chapter 16 of the FDOT's *PD&E Manual*.

4.3.2.1 Air Quality Analysis

In accordance with FDOT guidelines, the proposed improvements were analyzed for potential air quality impacts using FDOT's approved air quality screening model, CO Florida 2004. CO Florida 2004 incorporates the preferred models of U.S. EPA's MOBILE6 and CAL3QHC2, to evaluate project intersections. CO Florida 2004 predicts carbon monoxide concentrations at varying distances using conservative, worst-case assumptions about the meteorology, traffic and site conditions.

The air quality analysis revealed that since there are no air receptors within the proposed project corridor, the project automatically passes the screening test. Therefore, this project will not have a significant impact on air quality for either the No Build or the Preferred Alternative.

All state and local agencies were provided with an opportunity to comment on this project. There were no adverse comments regarding air quality.

This project is in an area which has been designated as attainment for all the air quality standards under the criteria provided in the Clean Air Act Amendments of 1990, therefore conformity does not apply.

4.3.3 Noise

4.3.3.1 Noise Assessment Methodology

The basic goals of noise criteria for highway projects are to minimize the adverse noise impacts on the community and to provide feasible and reasonable noise control where necessary and appropriate.

FHWA Highway Traffic Noise Abatement Criteria

The traffic noise abatement criteria, against which the project traffic noise levels are evaluated, are extracted from 23 CFR 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, FHWA, Washington, D.C. The criterion applicable for residences, churches, schools, recreational uses, and similar areas (refer to Table 4-1) is an exterior hourly equivalent sound level (L_{eq}) from the project that approaches or exceeds 67 dBA. The criterion applicable for other developed lands, such as commercial and industrial uses, is an exterior L_{eq} that approaches or exceeds 72 dBA. No criterion exists for underdeveloped lands or construction noise.

The FDOT considers the *approach criteria* to mean noise levels within 1 dBA of the appropriate FHWA Criteria. For this analysis, locations predicted to experience a noise level of 66 dBA were considered to be impacted.

TABLE 4-1
FHWA Highway Noise Abatement Criteria

Activity Category	Hourly A-Weighted Sound Level (dBA) L_{eq} (h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: 23 CFR 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise,* Federal Highway Administration, Washington D.C.

Note that a substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 dBA or more as a result of the transportation improvement project. Because the proposed extension is a new alignment, field measurements were required to determine the average existing noise level within the project corridor.

4.3.3.2 Noise Impact Analysis

A noise study was conducted in accordance with the *PD&E Manual*, Part 2, Chapter 17, to assess the potential noise impacts associated with the Preferred Alternative. Field measurements were taken in accordance with FHWA guidelines in accordance with *FHWA-PD-96-046, Measurements of Highway-Related Noise*. The measurements were accomplished using a QUEST Model 2400 Integrating Sound Level Meter.

There are no accessible roadways within the proposed project corridor that also access areas with noise sensitive sites. Consequently, existing noise levels were collected in an accessible area approximately ¼ mile south of the project corridor along Halifax Drive. The site was monitored during three separate ten-minute sessions between December 9 and 10, 2004. The field measurements are presented below in Table 4-2.

TABLE 4-2
Measured Ambient Noise Levels

Session	Time	Measured Ambient Noise Level (dBA)
1	8:30 AM	41.7
2	1:05 PM	43.8
3	5:40 PM	45.6
Average	--	43.7

Since no noise sensitive sites exist along the Preferred Alternative, and because none of the developments planned in proximity to the project corridor will have receptors close enough to the project study area, the proposed improvements are not anticipated to result in any noise impacts. The 66 dBA noise contour is approximately 165 feet from the proposed centerline of the roadway and all proposed developments are likely to fall outside this distance. Therefore, no further analysis is required.

4.3.4 Wetlands

In compliance with Executive Order 11990, Protection of Wetlands, a wetland evaluation was conducted to determine the impacts of the proposed improvements.

4.3.4.1 Wetland Methodology

Project biologists characterized and mapped wetlands and surface water features located within the project study area during a field investigation conducted in July 2003, October 2004, and January 2005. The project study limits were defined as a 500-foot wide corridor centered on the proposed roadway.

Prior to field reviews, the following documents were reviewed for pertinent information:

- Aerial photography, color infrared format, Natural Systems Analysts, Inc.
- Natural Resources Conservation Service (NRCS) *Soil Survey of Volusia County, Florida* (1989)
- FDOT's Florida Land Use, *Cover and Forms Classification System* (1999)
- U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (1987)
- *Florida's Wetland Delineation Manual* (Gilbert et. al., 1995)
- *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et. al., 1979)
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) Maps

Each wetland was classified based on the NWI categories, a system originating with the USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et. al., 1979). Each wetland was also classified according to the FDOT's *Florida Land Use, Cover and Forms Classification System* (FLUCFCS).

In addition to wetland delineation and classifications, field observations were documented regarding dominant vegetative species, hydrology and physical attributes, surrounding land use, observed wildlife species, and general condition of the wetland. These field data were collected in accordance with the FDOT's *PD&E Manual, Part 2, Chapter 18* for establishing a baseline description of the project wetlands.

4.3.4.2 Wetland Identification

The proposed corridor intersects few land use types. The majority of the corridor crosses wetlands, including wet pine flatwoods, cut-over pinelands leaving wet groundcover in a prairie-like habitat, pine and cabbage palm swamps, and areas of planted pine. The proposed roadway project is located within the floodplain and headwaters of the Tomoka River; however, does not cross the river channel. Table 4-3 presents the NWI classifications and corresponding FLUCFCS categories used to describe the wetlands found in the project area. Refer to Figure 4-3 for a graphical illustration of the wetlands identified within the project study area.

The wetlands are contiguous hydrologically, either directly or by ditches, to the floodplain of the Tomoka River. Thus, wetlands in the project study area meet the USACE definition of non-isolated wetlands.

Soils underlying the project area are predominantly flatwoods types, classified as Pineda-Malabar-Wabasso and Pomona-Wauchula soil associations. These soils are generally poorly drained, sandy and nearly level, with a seasonally high water table and scattered depressions and swamps.

4.3.4.3 Importance to the Community

Ditches (511 FLUCFCS)

Ditches are found along nearly every road and jeep trail in the study area and are generally cut through hydric soils. These ditches are typically swales or shallow channels excavated to convey water during storm events. In addition, the Volusia County Landfill has a perimeter collection ditch system designed and operated under a current National Pollution Discharge Prevention and Elimination System (NPDES) permit. A few constructed ponds occur nearby, west of the corridor. These are also associated with the Tomoka Farms Landfill facility. Typical species in the ditches include torpedograss (*Panicum repens*), softrush (*Juncus effusus*), pickerelweed (*Pontedaria cordata*), cattail (*Typha latifolia*), and coastal plain willow (*Salix caroliniana*). These ditches provide no human food source, cultural, or recreational use. The main NPDES collection perimeter ditch provides water quality and hydrologic function for the landfill facility.

Impacts to ditches in the project area are not expected to adversely affect the potential feeding area of wading birds. The majority of the wading birds, in particular Wood Storks, were observed at the landfill ponds. These ponds will not be impacted by the project; similarly, the majority of the wetlands and open water areas in the project corridor will be undisturbed. Additionally, new surface water foraging areas will be created in the form of stormwater ponds and ditches, thus, the amount of potential foraging habitat will not be decreased. No wading bird nesting areas will be disturbed by this project.

Cypress-Pine-Cabbage Palm (624 FLUCFCS)

This wetland community is the most extensive habitat type in the project area. It covers a large portion of the floodplain of the Tomoka River and forms the river's headwaters. This habitat is seasonally flooded and is dominated by a mix of cypress (*Taxodium distichum*), pine (*Pinus spp.*), and cabbage palm (*Sabal palmetto*). Additional minor canopy constituent species include live oak (*Quercus virginiana*), water oak (*Quercus nigra*), red maple (*Acer rubrum*), and water hickory (*Carya aquatica*). Groundcover was sparse due to dense canopy.

TABLE 4-3
FLUCFCS Categories and Corresponding NWI Classifications of the Wetland Vegetative Communities

FLUCFCS Code	FLUCFCS Classification	NWI*	General Description
511	Ditches	R3UB2Ex Riverine, Upper Perennial, Unconsolidated Bottom, Sand, Seasonally Flooded/Saturated, Excavated	Roadside ditches, swales, and canals excavated to convey water. Some vegetated with hydrophilic grasses, sedges, pickerelweed, cattail, willow. Saturated and seasonally flooded (shallow to deep).
624	Cypress-Pine-Cabbage Palm	PFO2/4/3E Palustrine, Forested, Needle-leaved deciduous/ Needle-leaved evergreen/ Broad-leaved evergreen, Seasonally Flooded/Saturated PSS (same with immature canopy)	A mixed forest of mature canopy (PFO) of cypress, pines, and cabbage palm. Some with red maple and bays. One area with young planted cypress - not yet a mature canopy (PSS). Groundcover of pickerelweed, arrowhead, grasses, sedges, rushes. Generally seasonally flooded.
625	Hydric Pine Flatwoods	PFO4D Palustrine, Forested, Needle-leaved evergreen, Seasonally Flooded/Well Drained	Slash pine dominates, with red maple, loblolly bay, sawgrass, sedges. Mostly intermixed with wetter areas of Cypress-Pine-Cabbage Palm and drier areas of pine flatwoods. Saturated and seasonally flooded (shallow).
441 / 643	Pine Plantations with wet groundcover, some recently cut-over	PEM1D Palustrine, Emergent, Persistent, Seasonally Flooded/Well Drained PSS (same with immature pine canopy)	Managed areas of planted pine (in various stages of re-growth) with wet groundcover of sedges, cordgrass, torpedo grass, sawgrass, softrush, cinnamon fern, chain fern, saltbush, camphor-weed, algal mats, and cypress saplings. This community may have pockets of uplands scattered throughout. Saturated soils in wet years, could be up to 80% wetland 20% upland.
630	Wetland Forested Mixed	PFO6/7E Palustrine, Forested, Deciduous/Evergreen, Seasonally Flooded/Saturated	Mature canopy of wetland hardwoods and pines mixed, with wetland grasses, sedges. Bays, red maple, hickory, elm, slash pine, cypress. Seasonally flooded, dry to saturated at other times.
641	Marsh	PEM1C Palustrine, Emergent, Persistent, Seasonally Flooded	Marsh areas associated with a pond north of I-4 and marsh area associated with a new-growth cypress mitigation area south of I-4. Herbaceous wetland with maidencane, pickerelweed, broom grass, St. John's wort, yellow-eyed grass, primrose willow, cinnamon fern, and Virginia chain fern; generally seasonally saturated at ground surface.
643	Wet Prairie	PEM1B Palustrine, Emergent, Persistent, Saturated	Managed (mowed) area of shallow, herbaceous wetland (non-forested) with grasses, sedges, and rushes; generally seasonally saturated at ground surface.

FLUCFCS – Florida Land Use, Cover, and Forms Classification System (FDOT, 1999)
NWI – National Wetlands Inventory (Cowardin et. al., 1979)

Note: Please refer to Appendix G for more detail.

SCALE: 1" = 1600'

TOMOKA FARMS LANDFILL

SHUNTZ RD. EXTENSION

INTERSTATE 4

B-3 ALIGNMENT & B-4 ALIGNMENT

Pond F3

LPGA BLVD

END PROJECT STA 1001+04

B-4 ALIGNMENT

Pond D-B4

Pond F2

TOWN WEST BLVD

CR 415 / TOMOKA FARMS RD

B-3 ALIGNMENT & B-4 ALIGNMENT

Pond B

Pond C1

LPGA BLVD EXTENSION

Pond E-B4

Pond E1-B3

FP&L Easement

SHUNTZ RD

B-3 ALIGNMENT

Pond D2-B3

Pond A1

LANDFILL RD

BLAKE DR

Compensation Pond

BEGIN PROJECT STA 800+00

MADELINE AVE EXTENSION

CR 415 / TOMOKA FARMS RD

Compensation Pond

Compensation Pond

Legend

Potential Ponds

Wetland Boundary

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	VOLUSIA	410252-1-22-01

LPGA BLVD. EXTENSION PD&E STUDY
EXISTING WETLANDS WITHIN THE PROJECT STUDY AREA

Figure **4-3**

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In the southern portion of the project study area (along Shunz Road), Cypress-Pine-Cabbage Palm swamp is interspersed with smaller areas of Hydric Pine Flatwoods and upland pine flatwoods. The dominant species can form a dense canopy stratum (90 to 100 percent canopy closure); or form a sparse canopy (less than 30 percent closure) in areas recently logged, such as an area immediately south of US 92. Harvesting of cypress and cabbage palm has been an economic use of these types of Florida wetlands in the past. Hunting is not allowed on the landfill property, as it is to the south on the well field, so no significant cultural resource or recreational public use can be attributed to this wetland community. The forested wetland provides value as wildlife habitat; as amphibian breeding areas, refuge, and forage for mammals, reptiles, and wading birds. Impacts to this community type were kept to a minimum to the extent practicable, by keeping the roadway as near to previously disturbed areas as possible; such as following existing roads, drainage canals, and going through cut-over pine plantation, rather than bisecting a large area of cypress-pine-cabbage palm community. The effects of the unavoidable wetland impacts on wildlife that may use this community type are further minimized by the placement of extra culverts under the proposed roadway to reduce the effect of habitat fragmentation. All unavoidable wetland impacts will be mitigated per state and federal wetland resource regulatory agency rules and guidelines during the permitting phase.

Hydric Pine Flatwoods (625 FLUCFCS)

A natural Florida wetland community, hydric pine flatwoods are found along the project corridor interspersed among Cypress-Pine-Cabbage Palm wetlands and the drier pine flatwoods. Hydric Pine Flatwoods are dominated by an open canopy of slash pine (*Pinus elliottii*) with red maple (*Acer rubrum*), loblolly bay (*Gordonia lasianthus*), dahoon holly (*Ilex cassine*), sawgrass (*Cladium jamaicense*), torpedograss (*Panicum repens*), redroot (*Lachnanthese caroliniana*) and sedges (*Rhynchospora* spp.). The drier portions contained saw palmetto (*Serenoa repens*). Soils are saturated seasonally, with surface inundation for only brief periods of time, or not at all in drought years. The wet pine flatwoods provides some value as wildlife habitat but no cultural resource or recreational public use. Logging (commercial use) may occur to a limited degree, as these areas are interspersed among wetter forested areas. Depending on the season and hydrologic conditions, this wetland community has wildlife value as forage area and refuge for large and small mammals, and reptiles; and as breeding areas for amphibians. As with the cypress-pine-cabbage palm community described above, impacts to the hydric pine flatwoods community were kept to a minimum to the extent practicable, by avoiding the larger expanses of hydric pine flatwoods, the use of culverts, and keeping the roadway as near to previously disturbed areas as possible.

Pine Plantations with Wet Prairie (441/643 FLUCFCS)

Managed pine plantation areas are common in the area. The wetter portions of this managed area support a groundcover of wetland grasses and sedges in the furrows between the rows of pines. These areas are distinguished from the 625 hydric pine flatwoods by a dense pine canopy in rows. Soils are saturated seasonally, with surface inundation for only brief periods of time, or not at all in drought years. Often there are small pockets of uplands throughout, making the overall 441/643 community roughly 80 to 85 percent wetlands. These areas would be delineated in the permitting phase.

The managed areas are in various growth stages as the harvesting and replanting rotation progresses from stand to stand. When the area is cleared of trees, the wet groundcover becomes the dominant vegetative descriptor. Typical of this are the cut-over areas north and south of Landfill Road. Species south of the road include torpedo grass (*Panicum repens*), softrush (*Juncus effusus*), cinnamon fern (*Osmunda cinnamomea*), Virginia chain fern (*Woodwardia virginiana*), and young cypress (*Taxodium* sp.); and north of Landfill Road, species include salt bush (*Baccharis* sp.), sedges (*Rhychospora* spp.), camphor-weed (*Pluchea* spp.), sand cordgrass (*Spartina bakeri*), and algal mats.

Wildlife habitat value of the pine plantations is limited compared to a forested wetland with more vegetative diversity, in both species composition of the canopy as well as in other strata (i.e. subcanopy, shrub and herbaceous layers). However, they do provide some refuge and forage for a number of wildlife species for sometime after the trees are replanted. Wetland impacts are unavoidable on this roadway corridor. Impacts were minimized by avoiding the higher quality wetlands to the greatest extent practicable. Thus, this managed pine/hydric groundcover community type will be displaced more than other forested wetlands that provide higher wetland functions. Additional culverts under the roadway will be used to help offset the impacts of habitat fragmentation. These managed pine/hydric groundcover community areas do provide significant commercial value for forest products such as lumber, and pulp wood for paper. These areas provide no food source and no recreational public use values because hunting is not allowed on the land fill property.

Wetland Forested Mixed (630 FLUCFCS)

Wetland Forested Mixed extends, in contiguous sloughs, from the lower end of Bennett Swamp (in the northern section of the project) to southern sections of the project. It borders the Tomoka River to the east. Typical vegetative species in the Wetland Forested Mixed are loblolly bay (*Gordonia lasianthus*), sweet bay (*Magnolia virginiana),* slash pine (*Pinus elliottii),* bald cypress (*Taxodium distichum),* swamp bay (*Persea palustris),* red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), and cabbage palm (*Sabal palmetto*) in the canopy. The subcanopy is dominated by fetterbush (*Lyonia lucida*), wax myrtle (*Myrica cerifera*), eastern false-willow (*Baccharis halimifolia*), cinnamon fern (*Osmunda cinnamomea*), netted chain fern (*Woodwardia areolata*), and Virginia chain fern (*Woodwardia virginica*). Slash pine (*Pinus elliottii),* gallberry (*Ilex glabra*), and saw palmetto (*Serenoa repens*) are common in the adjacent upland areas. Soils are organic and saturated seasonally, with surface inundation for brief or extended periods of time. Wetland Forested Mixed areas along the project corridor provide value as wildlife habitat, but no economic, cultural resource, or recreational public use. The higher diversity of the vegetative composition and variable hydrologic regime, compared to other forested wetlands, makes this type of wetland habitat valuable to a variety of animal species, for forage, refuge, and as breeding area. The proposed alignment is near some areas of the wetland forested mixed community between I-4 and US 92; however, habitat fragmentation impacts were kept to a minimum by keeping the roadway near the edge of the community rather than bisecting the larger area. Impact to this wetland will mainly be for a treatment pond, which is needed to ensure high water quality in the remaining wetlands and in the downstream Outstanding Florida Water. The resulting impact to this habitat, in the specific area of the proposed pond, will be a change in wetland type, from a forested wetland to an open water pond. Wildlife will have access to the remaining forest as well as the pond. However, this pond will be a loss of federal agency jurisdiction, and so, as previously stated, this impact will be fully mitigated per