

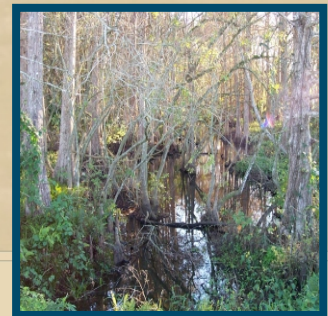
LPGA BOULEVARD FEASIBILITY STUDY

From CR 415 near the
Volusia County Landfill
entrance to SR 600
(US 92) at LPGA Boulevard

April 2004

Volusia County, Florida

Federal Project No.: 7777 100A
Financial Project ID No: 410252-1-22-01



Roadway Extension Analysis

LPGA Boulevard Feasibility Study

From CR 415 near the Volusia County Landfill
entrance to SR 600 (US 92) at LPGA Boulevard

Federal Project No.: 7777 100A

FIN: 410252-1-22-01

Volusia County, Florida

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April 2004



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Section 1

Executive Summary

Executive Summary

Florida Department of Transportation (FDOT) – District 5, in conjunction with local governments (Volusia County Department of Public Works (DPW) & Volusia County Metropolitan Planning Organization (MPO), City of Port Orange, & City of Daytona Beach) is conducting this Feasibility Study for the proposed 3.8-mile extension of LPGA Boulevard. The extension of LPGA would occur from County Road 415 (CR 415) near the entrance to the Volusia County Landfill to the current southern terminus at US 92 through largely undeveloped property, the majority of which is publicly held. This proposed extension would connect two higher-speed regional facilities in LPGA Boulevard and CR 415 (Tomoka Farms Road).

The proposed LPGA Boulevard Extension was conceived as a critical link in establishing a regional north-south alternative to Interstate 95. Combined with the existing LPGA Boulevard and CR 415 to the south, the new facility would serve commuter traffic as well as local traffic from existing and proposed development in the immediate region. This LPGA Boulevard extension has been identified in the Volusia County MPO's 2020 Long Range Transportation Plan Refinement (LRTP-R, Reference 1) and the Volusia County Thoroughfare Plan (Reference 2), as well as both the City of Port Orange's (Reference 3) and City of Daytona Beach's (Reference 4) Comprehensive Plans, which suggests regional support. However, there are differences between the various plans in how the alignment configuration is shown. This Feasibility Study also offers consideration to the recently completed Madeline Avenue Extension Study by Volusia County. That study evaluated extending Madeline Avenue westward over Interstate 95 to provide an east-west connection between CR 415 and Williamson Boulevard.

The Florida Department of Transportation has prepared this Feasibility Study to assess traffic demand, evaluate impacts to the environment, estimate the potential costs, and identify any potential "fatal" flaws associated with an extension of LPGA Boulevard. This was done with guidance from Volusia County DPW and Volusia County MPO, City of Port Orange, City of Daytona Beach, local property owners and the general public.

Traffic forecast modeling projections were established for a design year of 2030. The traffic modeling used the Central Florida Regional Planning Model Two for all analyses conducted. This model was validated in 1999 and again in 2003 within the LPGA study area. A single land use scenario and eighteen roadway network modeling alternatives were developed by the project team and agreed upon in subsequent meetings with Volusia County DPW and Volusia County MPO, the City of Port Orange, and the City of Daytona Beach.

Traffic modeling results for 2030 indicate traffic volumes along the extension corridor in the 12,200 to 20,000 average daily trips (ADT) range. This projected level of traffic volume would only warrant a two-lane LPGA extension facility. However, should the traffic volumes approach the upper range (20,000 ADT) of the projection, consideration of a four-lane facility should be made.

The proposed LPGA roadway will employ a two-lane typical section and adhere to FDOT roadway design standards assuming a 55 mile-per-hour design speed. Although, initial traffic volumes do not warrant a larger facility, Volusia County has an adopted policy to provide for the future expansion of higher classification roadways to four-lanes or greater. As such, the sizing and placement of ponds in this evaluation included the consideration of a four-lane facility.

The LPGA Extension alignment was motivated by the configuration shown in the Volusia County MPO 2020 Long Range Transportation Plan-Refinement (LRTP-R), where LPGA Boulevard becomes the major north-south connection over the existing CR 415. CR 415 would connect back into LPGA at a new T-intersection at the south end of the extension, potentially reducing traffic congestion north of I-4 on CR 415. This LPGA alignment also includes a two-span bridge over I-4 that is approximately 232 feet in length. Also, a 50-foot wildlife crossing bridge or box culvert would be provided with the potential LPGA Extension to allow the study area wildlife access to either side of the roadway.

For the purposes of this Feasibility Study, ponds have been sized to accommodate a future expansion of the proposed two-lane roadway to a four-lane typical section. The system was developed with the objectives of minimizing property impacts and complying with Outstanding Florida Waters (OFW) criteria. A total of five pond sites totaling 43.15 acres would be required to provide treatment and attenuation of stormwater runoff from the proposed roadway. This includes the additional volume required to offset the impact the proposed roadway would have on the 100-yr flood plain.

The estimated elevation of the 100-year floodplain is 25 feet for the study area. The area of the corridor that is located within the 100-year floodplain is estimated at 13,800 linear feet, with a 150-foot corridor for an impact area of 47.52 acres. With an impact depth of 0.5 foot, the volume of displaced floodplain is approximately 23.76 acre-feet. The proposed project would need to include mitigation for the displaced floodplain within designated floodplain compensation ponds. This additional pond area has been included in the sizing of ponds and right-of-way estimates for the project.

As part of this Feasibility Study, a broad-level general investigation of the parcel impacts and associated costs was conducted. To provide for a potential four-lane roadway, a 150-foot right-of-way corridor was developed and estimated. Along the 3.78-mile extension approximately 100 acres of land would be impacted under this assumption, with the vast majority being publicly owned. As a basis for comparison, the right-of-way required for a two-lane facility within a 100-foot corridor was also developed. The preliminary estimate of right-of-way impacts yielded the following costs:

- 100-foot right-of-way corridor.....\$3,906,000
- 150-foot right-of-way corridor.....\$4,362,000

There are a number of areas along the proposed LPGA corridor where utility impacts could be realized, including gas, fiber-optic cable, powerlines, force mains, utility and power pole relocations. Initial estimates indicated that the utilities relocation associated with the LPGA Extension would be within an order of magnitude of \$150,000. This assumes two FPL poles would be relocated and three new intersections would require new utilities or existing utility relocations.

Approximate roadway construction costs were developed using the FDOT Long Range Estimating System for the 3.8-mile project. Key components used in the LRE include an additional 5 feet of fill to elevate the roadway above natural ground (to achieve proper drainage), all pavement and base materials, signing and striping, signal costs for three new intersections, maintenance of traffic and mobilization. The roadway construction cost totaled approximately \$10,359,000 or \$2,740,000 per mile of construction. This included a contingency factor of 15%.

The overall cost of the project includes not only construction costs, but right-of-way, design, wetland mitigation, and construction engineering inspection. At the Feasibility Study stage, all

facets of the projected cost cannot be determined with exacting detail. However, through this evaluation, the major cost components have been estimated to produce a reasonable overall project cost. This cost will provide guidance to decision makers in determining the feasibility of this project. Table 1 provides a summary of the preliminary project costs to construct a two-lane roadway in either 100-ft or 150-ft of right-of-way. Providing for a future expansion to a four-lane facility in keeping with the Volusia County policy for this type of facility will require 150-ft of right-of-way. The total cost estimates for the 100-foot and 150-foot right-of-way project scenarios are approximately \$21.5 million and \$21.9 million dollars, respectively.

Table 1 Preliminary Project Cost Summary

Cost Description	100-foot right-of-way	150-foot right-of-way
Right-of-Way	\$3,906,000	\$4,362,000
Design	\$2,200,000	\$2,200,000
Roadway Construction	\$10,359,000	\$10,359,000
Bridge Construction	\$1,863,000	\$1,863,000
Utility Costs	\$150,000	\$150,000
Wetland Mitigation Costs ¹	\$1,139,000	\$1,139,000
Construction Engineering Inspection ²	\$1,833,000	\$1,833,000
Grand Total	\$21,450,000	\$21,906,000

1 Wetland mitigation costs assume a 2004 cost of \$88,300/acre for 12.9 acres of mitigation. This is based on constructing a 2-lane roadway in either 100-ft or 150-ft of right of way.

2 Construction Engineering Inspection is assumed to be 15% of roadway construction + bridge costs based on previous experience with similar projects.

The proposed corridor presents a number of environmental issues for regulatory consideration:

- The environment impacted by the proposed corridor is in the Tomoka River watershed, within the 100-year floodplain of the Tomoka River.
- The proposed corridor north of I-4 is within the Tomoka River OFW basin.
- A large portion of the impacted wetlands is forested secondary habitat for the Florida Black Bear, a Florida Species of Special Concern.
- The northern end of the proposed corridor intersects the secondary habitat zone of an American Bald Eagle nest.

The high wildlife habitat values of the project area present a set of issues to resolve during the regulatory process. Each one of the expected impacts has regulatory significance and no one issue alone would likely present a regulatory barrier to the project. The combined impacts will have greater influence on regulatory decisions than any one of the issues considered alone.

Based on the results of the analysis summarized in this report, it is recommended that the extension of LPGA Boulevard be continued forward into a detailed Project Development and Environmental Study (PD&E) for further analysis.

These recommendations were presented to the Volusia County MPO Technical Coordinating Committee (TCC) and Citizens Advisory Committee (CAC) on February 17, 2004 and the full MPO Board on March 23, 2004. Each of these elements of the Volusia MPO concurred with the recommendation to move forward into the PD&E process.

Section 2

Introduction

Introduction

PROJECT DESCRIPTION

Florida Department of Transportation (FDOT), District 5, in conjunction with local government (Volusia County, Volusia County MPO, City of Port Orange, & City of Daytona Beach) is conducting this Feasibility Study/analysis for the proposed 3.78-mile extension of LPGA Boulevard. The extension of LPGA would occur from CR 415 (Tomoka Farms Road) near the entrance to the Volusia County Landfill to its current southern terminus at US 92 through largely undeveloped property, the majority of which is publicly held. This proposed extension would connect two higher-speed regional facilities in LPGA Boulevard and CR 415 (Tomoka Farms Road). Figure 1 shows a site vicinity map of the area. Figure 2 more specifically shows the proposed roadway extension map. This extension has been identified in Volusia County MPO's 2020 Long Range Transportation Plan-Refinement (2020 LRTP-R, Reference 1) and the Volusia County Thoroughfare Plan (Reference 2), as well as both the City of Port Orange's (Reference 3) and City of Daytona Beach's (Reference 4) Comprehensive Plans.

The LPGA Boulevard Extension project is third on the Volusia County MPO's adopted Fiscal Year 2003-2004 Roadway Priority List. It is the MPO's policy within their work program to complete all projects listed within the top five, and no other projects can move ahead of a top five project until it is completely finished. The premise for this policy is to ensure projects are carried through from start to finish.

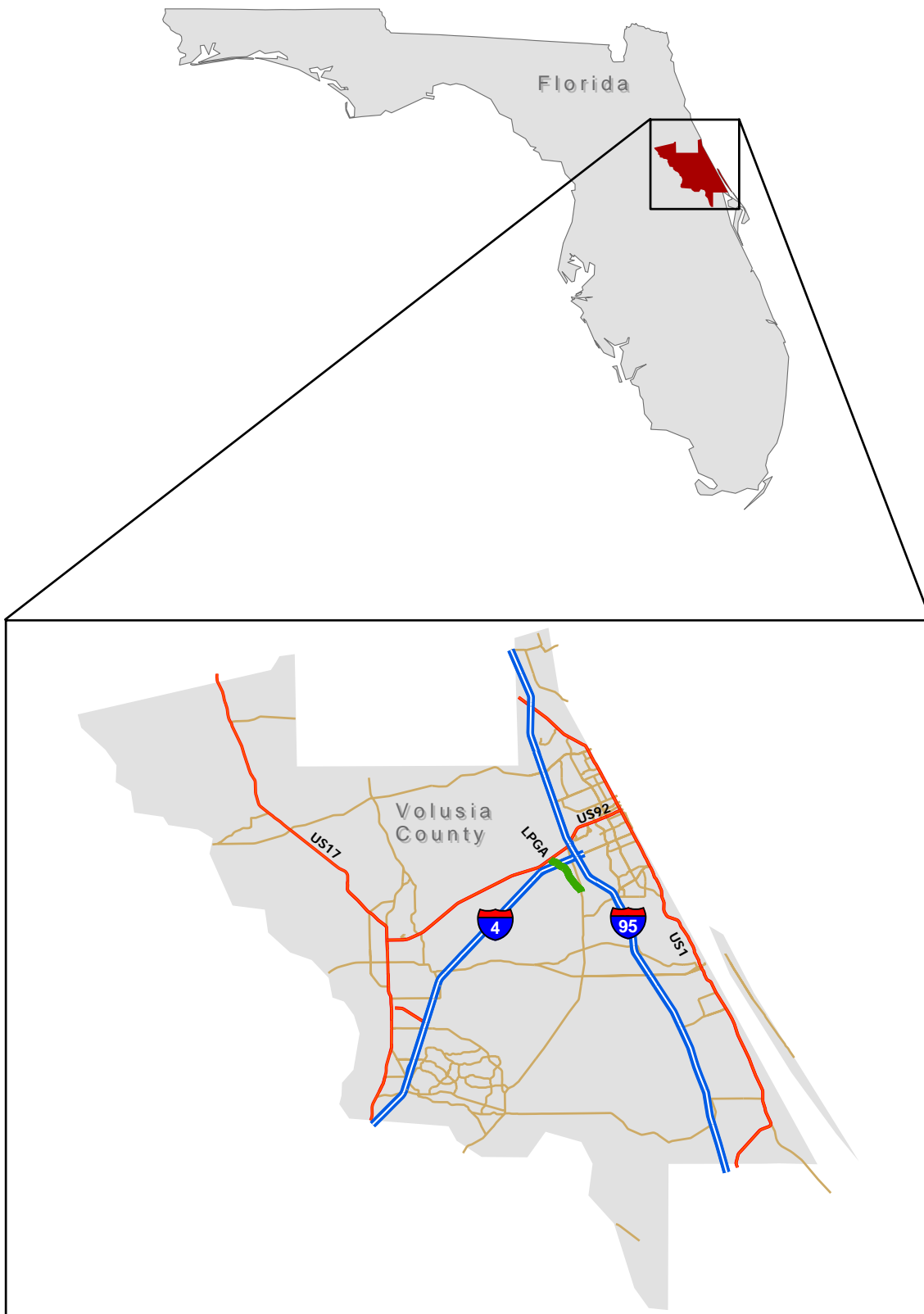
Wetlands are present throughout the study corridor, including portions of the headwaters for the nearby Tomoka River. The site vicinity also contains habitat for various wildlife including the Florida Black Bear and Bald Eagle. South of the corridor is the Tomoka Marsh Aquatic Preserve.

The majority of the proposed corridor is undeveloped, publicly held land. Near the proposed corridor is an existing landfill operation and a number of planned future developments, all creating traffic demand in the future.

If this evaluation shows no "fatal" flaws and the project is found to be feasible, local government can advance the project for further study. The project would then be studied under the more-detailed Project Development & Environmental (PD&E) Study process, keeping the project eligible to receive federal funding.

PROJECT PURPOSE

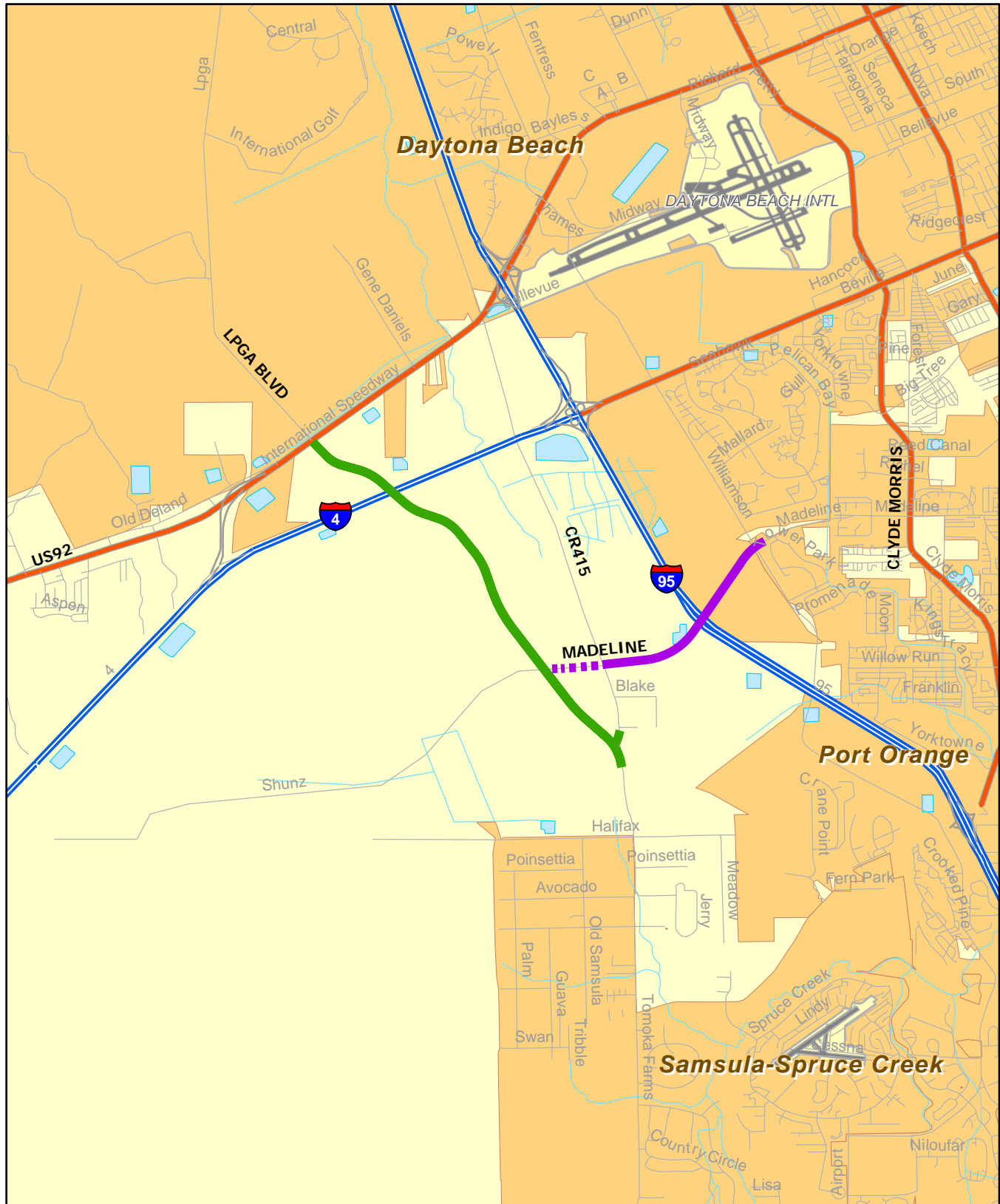
The proposed LPGA Boulevard Extension was conceived as a critical link in establishing a regional north-south alternative to Interstate 95. Combined with the existing LPGA Boulevard and CR 415 to the south, the new facility would serve commuter traffic as well as local traffic from development in the immediate region. The inclusion of the LPGA Boulevard Extension from CR 415/Tomoka Farms road northerly to its current southern terminus at US 92 in the Volusia County MPO's 2020 Long Range Transportation Plan-Refinement (LRTP-R, Reference 1) and the Volusia County Thoroughfare Plan (Reference 2), as well as both the City of Port Orange's (Reference 3) and City of Daytona Beach's (Reference 4) Comprehensive Plans, which suggests regional support for the



LEGEND

- Interstate Roadway
- Regional Roadway
- Local Roadway
- LPGA Blvd Extension





LEGEND

- LPGA Blvd Extension
- Madeline Ave Extension (Volusia County)



0 0.5 1 2 Miles

project. However, the various plans differ in their interpretation of how the alignment is to be configured.

The proposed extension corridor and its surrounding areas were investigated in a detailed review of each local government jurisdiction's long-range and comprehensive planning documents. Key projects identified included:

- LPGA Boulevard southern extension
- Madeline Avenue/Shunz Road western extension
- Dunn Avenue western extension
- CR 415 (Tomoka Farms Road) northern extension
- Stagecoach Road construction (new road)

For more detailed information see Appendix "A", which contains the detailed plan review document.

The key project listed previously that has the most direct impact on the LPGA Extension is the Madeline Avenue Extension. Volusia County recently completed the alignment study for this project that extends Madeline Avenue westward from its existing terminus at Williamson Boulevard, over Interstate 95, and connects to CR 415 via one of two routes, Landfill Road or Shunz Road. The Shunz Road alignment alternative was selected due to a significant right-of-way donation from the Coraci family.

As part of the Madeline Avenue Extension Study, Reference 5, Volusia County developed a preliminary alignment for the LPGA Extension that was shown on the concept plans. This showed the LPGA Extension tying into the Madeline Avenue intersection with CR 415. This created a four-legged intersection in which the LPGA Extension was essentially a continuation of Madeline Avenue beyond CR 415 (Tomoka Farms Road). To remain consistent with the Volusia County MPO's 2020 Long Range Transportation Plan-Refinement, the alignment considered for this study includes a different configuration for the intersections of LPGA/Madeline and LPGA/CR415.

Proposed growth in the region is another motivation for the proposed improvement. The LPGA Boulevard Extension, in addition to several other improvements to the network west of Interstate 95, is intended to support planned and future development within this region. Figure 3 provides an overview of the identified key developments that would directly impact a new LPGA Boulevard Extension, which include the Coraci Planned Urban Development (PUD), Consolidated Tomoka Development, Landfill Industrial Park and the First Baptist Church. These will be discussed further in the traffic modeling section of this feasibility report.

SCOPE OF THE REPORT

The Florida Department of Transportation has prepared this feasibility study to assess traffic demand, evaluate impacts to the environment, and estimate the potential costs associated with an extension of LPGA Boulevard. This feasibility study will review and seek to identify any potential "fatal" flaws associated with the potential improvement related to engineering and design,



LEGEND

- LPGA Blvd Extension
- Madeline Ave Extension (Volusia County)



0 0.25 0.5 1
Miles

environmental impacts, right-of-way acquisition, or other potential challenges. This will be done with guidance from Volusia County, Volusia County MPO, City of Port Orange, City of Daytona Beach, vested property owners and the general public.

This Feasibility Report addresses the following issues:

- Traffic Volumes – Forecast Model Projections;
- Engineering Evaluation – Roadway Alignment;
- Environmental Impacts;
- Public Involvement (Comments & Coordination); and
- Conclusions and Recommendations.

Section 3

Traffic Forecast Model Projections

Traffic Forecast Model Projections

The traffic forecast modeling serves a very important role in detailing the feasibility or warranting of an extension of LPGA Boulevard. Within this traffic modeling process, input and interaction were sought from each of the involved jurisdictions. A review of development traffic studies was conducted in an attempt to model the most realistic traffic conditions to test potential future scenarios. Two separate meetings were conducted at the City of Port Orange in which open discussions took place with regards to which forecast model format to use, future roadway network, land uses, and socioeconomic data. These issues as well as detailed model results will be discussed in detail in this section.

MODEL BACKGROUND

The Central Florida Regional Planning Model Two (CFRPM II) developed for FDOT District V was used for the traffic modeling. The validation Year 1999 model was revalidated in the LPGA study area, which extended from Taylor Road to the South to SR 40 to the North and from LPGA Boulevard to the West to Clyde Morris Boulevard to the East. All results represent a future Year 2030 modeling effort.

SOCIOECONOMIC DATA

The socioeconomic data used for the LPGA Boulevard feasibility study were provided by the City of Daytona Beach and the City of Port Orange. This data reflects those cities' best estimation of growth and development for the design year, most of which occurs west of I-95. The county-wide population used in this study is 644,371. This compares favorably with the Bureau of Economic and Business Research (BEBR)'s medium range forecast for the Year 2030, which is 651,300. We managed to stay under the BEBR medium forecast for the design year for socioeconomic data.

TRAFFIC MEETING DISCUSSIONS

Roadway Network

An existing/baseline model and eighteen modeling alternatives for the Year 2030 were determined by the project team and were agreed upon in subsequent meetings with Volusia County Traffic Engineering, Volusia County MPO, the City of Port Orange, and the City of Daytona Beach. Table 2 shows a summary of the different modeling alternatives as recorded at the December 18, 2003 traffic coordination meeting at the City of Port Orange.

Table 2 Traffic Modeling Alternatives Summary

Alternative	Description
Alternative 1	MPO adopted 2020-plan network with a modification where the LPGA Boulevard extension ties into Madeline Avenue.
Alternative 2	Same as Alt. 1 with the LPGA Boulevard interchange with I-4 removed.
Alternative 3	Same as Alt. 1 with the southern extension of LPGA Boulevard connecting to CR 415 south of Madeline Avenue.
Alternative 4	Same as Alt. 3 with the LPGA Boulevard interchange with I-4 removed.
Alternative 5	Same as Alt. 2 with the Tomoka Farms Road overpass at I-4 removed.
Alternative 6	Same as Alt. 4 with the Tomoka Farms Road overpass at I-4 removed.
Alternative 7	Same as Alt. 2 with the addition of the Tomoka Farms Road extension from LPGA Boulevard to SR 40.
Alternative 8	Same as Alt. 4 with the addition of the Tomoka Farms Road extension from LPGA Boulevard to SR 40.
Alternative 9	Same as Alt. 4 with the Stagecoach Road extension to Tymber Creek Road
Alternative 10	Same as Alt. 9 with the Tomoka Farms Road extension from LPGA Boulevard to SR 40
Alternative 11	Same as Alt. 4 with the Stagecoach Road extension connecting at Dunn
Alternative 12	Same as Alt. 11 with the Tomoka Farms Road extension from LPGA Boulevard to SR 40
Alternative 13	Same as Alt. 3 with the Shunz Road interchange at I-4 and no interchange at Taylor Road and I-4
Alternative 14	Same as Alt. 4 with the Shunz Road interchange at I-4 and no interchange at Taylor Road and I-4
Alternative 15	Same as Alt. 2 with the Shunz Road interchange at I-4 and no interchange at Taylor Road and I-4 and with the Stagecoach Road extension to Dunn and with the Tomoka Road extension from LPGA to SR 40
Alternative 16	Same as Alt. 15 with the Tomoka Farms Road overpass at I-4 removed.
Alternative 17	Same as Alt. 4 with the Shunz Road interchange at I-4 and no interchange at Taylor Road and I-4 and with the Stagecoach Road extension to Dunn and with the Tomoka Road extension from LPGA to SR 40
Alternative 18	Same as Alt. 17 with the Tomoka Farms Road overpass at I-4 removed.

Land Use

The land use used for modeling the eighteen alternatives for the LPGA feasibility study came from the following sources:

- a. City of Daytona Beach – land information in ZDATA1 and ZDATA2 format
- b. City of Port Orange – land use information for particular developments
- c. “Tomoka Farms Industrial Park” Traffic Impact Analysis Report – both traffic and land use information was gathered from this particular document for the Landfill and Industrial Park sites. The report provided Year 2008 traffic volumes. These volumes with no growth factor were used to represent Year 2030 traffic (8,200 daily trips entering/exiting the landfill/industrial park area).
- d. “Traffic Impact Analysis Report for the First Baptist Church of Daytona Beach” – both traffic and land use information was gathered from this document. This report showed that 4,190 daily trips were entering and exiting the Baptist Church site. These volumes with no growth factor were used to represent Year 2030 traffic (4,190 daily trips entering/exiting).
- e. Volusia County Traffic Engineering – The County Traffic Engineer indicated that Stagecoach Road would only be built as part of a 10,000 home development. Therefore, for all alternatives containing Stagecoach Road, an additional traffic analysis zone was added to load in the 10,000 single-family dwelling units onto Stagecoach Road only.
- f. “Ormond Crossings” Preliminary Assessment Report by Tomoka Holdings, LLC – The land use was incorporated into the model at the request of the county and the City of Ormond Beach. However, the impacts of this development to the LPGA Boulevard Extension are negligible or minimal at best.

2030 TRAFFIC MODELING RESULTS

Based on Year 2030 traffic model runs, ADT values for the LPGA Boulevard Extension are approximately 12,000 to 20,000. Figure 4 shows the typical ranges of the 2030 traffic projections for the study roadway network. Since this extension is in a predominantly suburban to ruralized area for the design year with fewer trip purposes using the facility, the K factor will be higher than for a similar urbanized facility. With this in mind, a two-lane facility should be sufficient with four-laning likely to be needed as the design year approaches or shortly thereafter. *The detailed results of the 2030 traffic forecasts for the eighteen network scenarios are provided in Appendix “B”.*



FIGURE 4

Section 4

Engineering
Evaluation &
Alignment

Engineering Evaluation & Alignment

This engineering evaluation & alignment section identifies and discusses issues surrounding the physical design of the LPGA roadway extension. This includes typical and bridge sections, a roadway alignment layout, and a summary of the preliminary project costs, including right-of-way impacts.

ROADWAY TYPICAL SECTION

A typical section defines the cross-sectional characteristics of a roadway along a corridor. The typical section must be designed to match the roadway's defined functional classification and street-design guidelines of the controlling jurisdiction, which in this case is Volusia County. The LPGA Extension will employ a two-lane typical section with a 55 mile per hour design speed, which is consistent with the existing LPGA Boulevard posted speed of 55 miles per hour. This 55 mile-per-hour design speed is also similar to the 65 mile-per-hour and 50 mile-per-hour posted speeds on US 92 and CR 415, respectively, both in the immediate site vicinity.

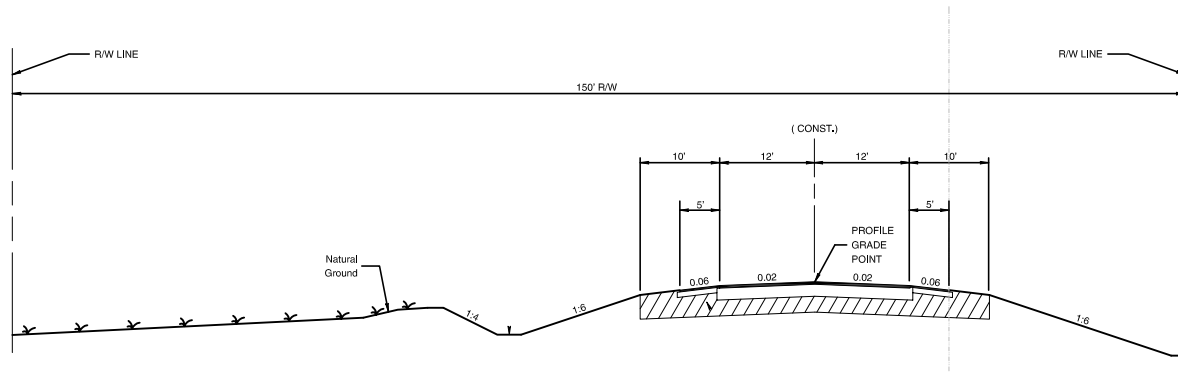
As discussed in the previous section, the 2030 traffic volume projections would warrant only a two-lane facility. Volusia County has adopted a policy to design higher classification roadways to accommodate a four-lane ultimate section. As such, the LPGA Boulevard Extension will be designed such that the sizing and placement of drainage ponds will accommodate a four-lane facility. Both the two-lane and the potential future four-lane typical sections are shown in Figure 5. Based on discussions during jurisdiction meetings, a 100-foot approximate construction limit width was set to help guide the initial analysis of the typical two-lane section.

INTERSTATE 4 OVERPASS BRIDGE

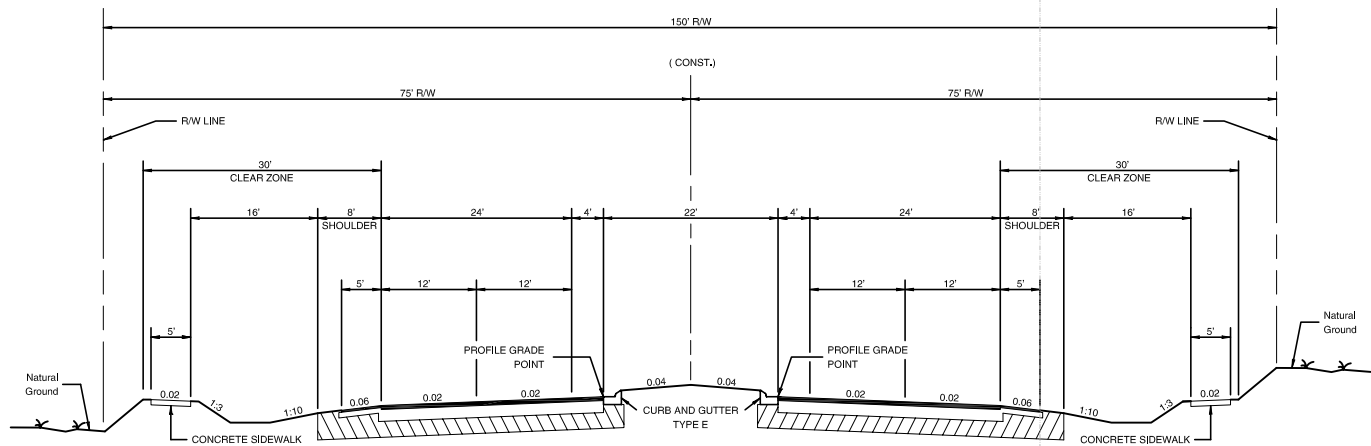
A bridge is required to carry the proposed LPGA Boulevard over I-4. The bridge length is controlled by two conditions. The first condition is the ultimate I-4 typical section. It is necessary to accommodate a 44-foot rail corridor down the center of the median, two 10-foot inside shoulders with three 12-foot travel lanes in each direction and 36-foot clear zones from the outside edge of travel to the vertical face of the bridge embankment or MSE wall. The second condition that controls the bridge length is the skew at which LPGA Boulevard crosses I-4. The proposed alignment creates an 18-degree bridge skew. Bridge skew is defined as the acute angle measured between a perpendicular to the longitudinal line and the skew line itself. In this case it is the complement to the intersection angle between LPGA and I-4. This skew, coupled with the required clearances yields a total bridge length of approximately 220 feet from MSE wall to MSE wall and approximately 232 feet from the front face of backwall to front face of backwall. A two-span bridge with one pier on the centerline of I-4 is a probable configuration. This will create two 116-foot spans. Spans of this length indicate the use of prestressed AASHTO Type V beams or a similar depth Florida Bulb Tee beam. A conceptual plan and elevation for this bridge can be seen in Figure 6.

As stated above, the current proposed alignment is skewed at 18 degrees with respect to the I-4 Mainline. Any increase in the skew angle would cause an increase in the span lengths. If the span lengths increase considerably, the use of deeper concrete beams or steel plate girders may be indicated. This would increase the costs of the bridge. From the bridge perspective, maintaining a skew angle less than 30 degrees is desirable.

LPGA BOULEVARD EXTENSION FEASIBILITY STUDY



YEAR 2025 DESIGN
2 LANE TYPICAL SECTION



POTENTIAL FUTURE DESIGN
4 LANE TYPICAL SECTION

TYPICAL CROSS SECTIONS
VOLUSIA COUNTY, FLORIDA

FIGURE

5

Drawing Path

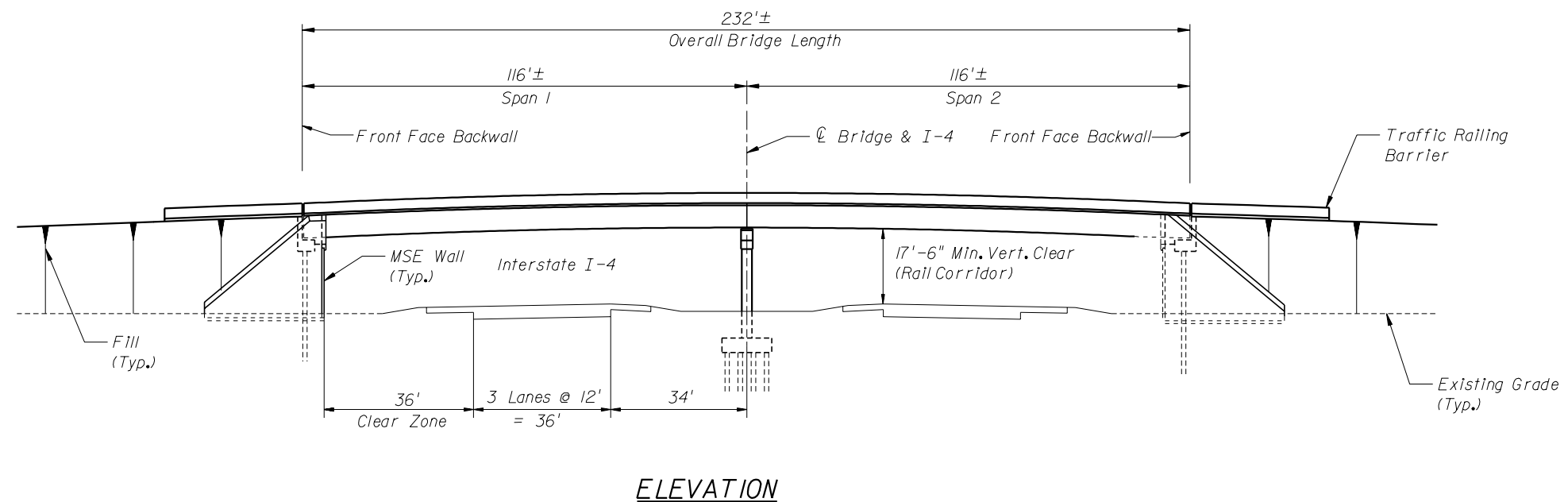
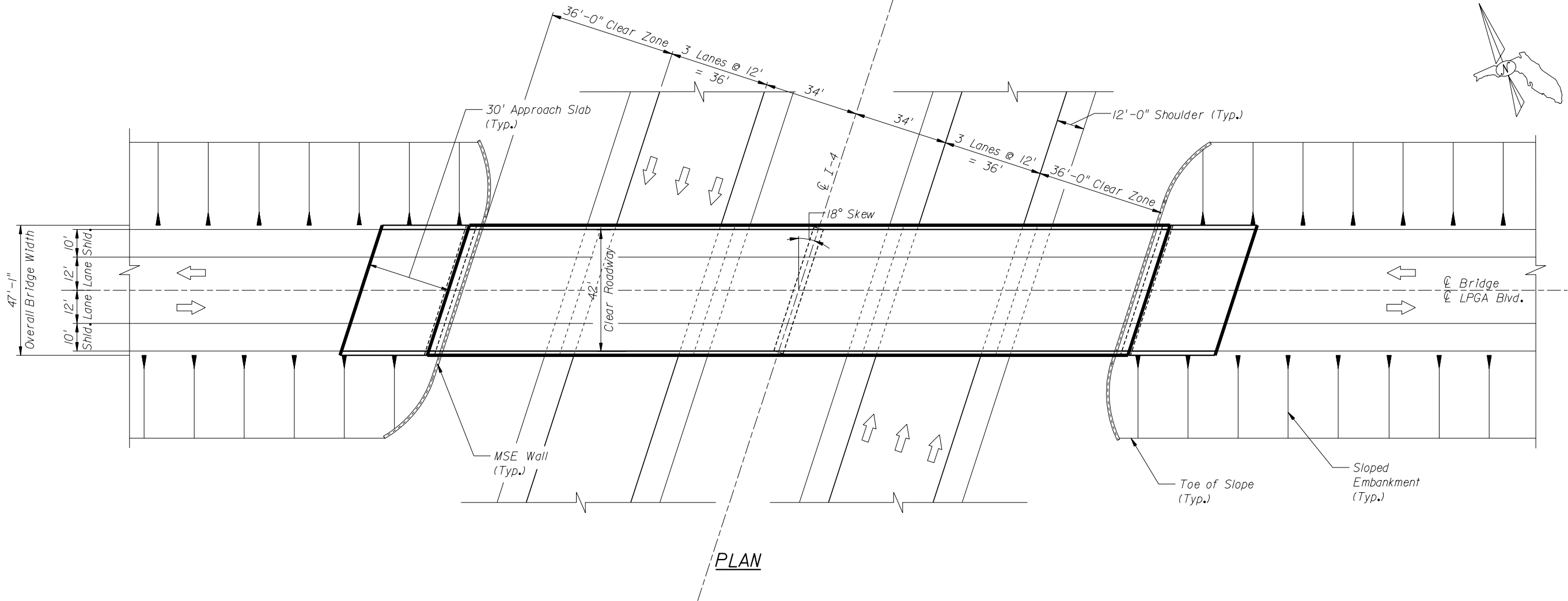


FIGURE Y

REVISIONS			NAMES		ENGINEER OF RECORD	SHEET TITLE			PROJECT NAME	SHEET NO.
DATE	BY	DESCRIPTION	CHECKED BY	DATES		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
FIGURE 6			DRAWN BY		CH2M HILL				PLAN AND ELEVATION	
			CHECKED BY		9428 BAYMEADOWS ROAD				LPGA BLVD. OVER I-4	
			DESIGNED BY		SUITE 200					
			CHECKED BY		JACKSONVILLE, FL 32256					
			APPROVED BY		OFFICE (904) 733-9119					
					FAX (904) 733-9570					
					License No. 000072					

The proposed bridge typical sections are based upon the roadway typical sections seen in Figure 4. The first roadway typical section is the two-lane condition. The two-lane bridge typical section will consist of two 12-foot travel lanes, two 10-foot outside shoulders, and two 1-foot, 6½-inch traffic-railing barriers. This gives an overall bridge width of 47 feet, 1 inch. This bridge typical section can be seen in Figure 7. The location of the bridge within the right of way would be such that future widening of the section to four lanes could be easily accomplished.

The new replacement bridge for US 92 ramp off of I-4, to the west of this project, has deep muck that is not capable of supporting the high fill approaches. That project is currently looking at increasing the bridge length to span the muck. Our preliminary soils investigation indicates that this site has only a few feet of muck, that is removable, therefore there appear to be no special concerns at this time. Pier and end bent foundations are envisioned to be typical pile foundations. MSE walls will be located at the bridge ends to retain the approach embankment. An in-depth soils investigation will be made in the coming phases of this project. This investigation will determine the location and magnitude of the muck in the vicinity of the proposed bridge.

The approximate construction costs to develop the Interstate overpass bridge is around \$1,256,000.

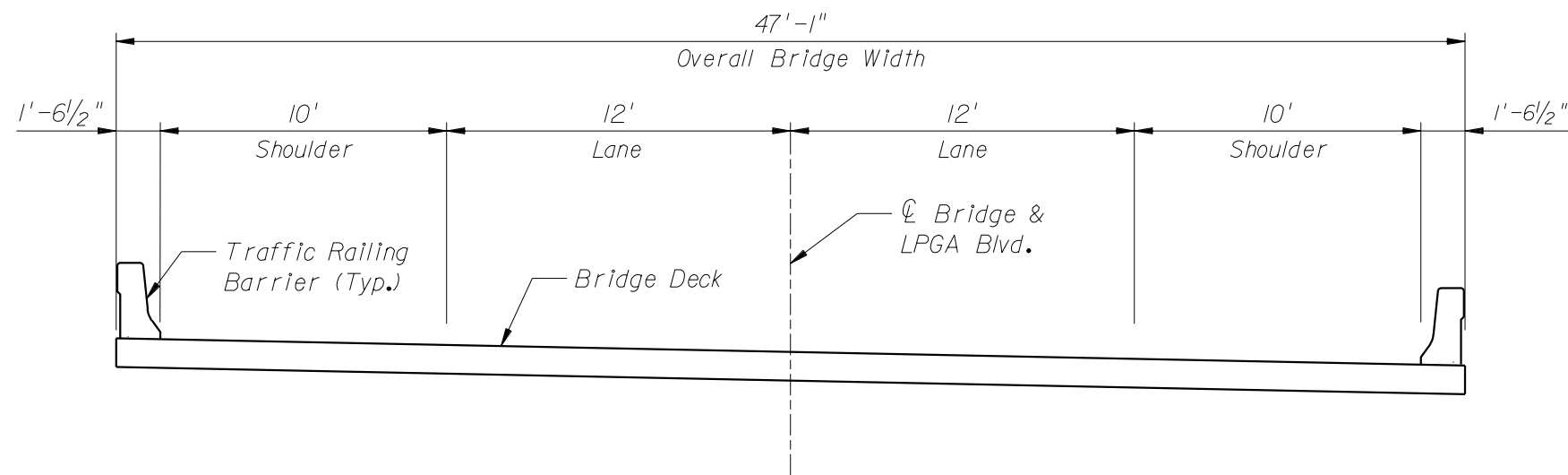
LPGA WILDLIFE CROSSING

A wildlife crossing on LPGA Boulevard is proposed for this project. The type and location of this crossing has not been finalized. One feasible low-cost alternative would be the development of a box culvert-style crossing as shown below on SR 46. For application along LPGA Boulevard, a two barrel, three sided box culvert with 25-ft spans could be assumed. The culvert bridge itself would cost approximately \$75 per square foot of deck area, which includes the cost of the box culverts, foundations, and other materials. With the addition of approach roadway fill, the total cost for the box culvert crossing option would be approximately \$230,000. Wildlife fencing would be additional.



Wildlife Underpass along SR 46, Lake County.

Picture copied from <http://www.fhwa.dot.gov/environment/wildlifecrossings/bear.htm>



BRIDGE TYPICAL SECTION
(CONSTANT CROSS SLOPE SHOWN, SECTION DEPENDENT ON FUTURE WIDENING PLANS.)

FIGURE X

REVISIONS			DRAWN BY	NAMES	DATES	<div>ENGINEER OF RECORD CH2M HILL 9428 BAYMEADOWS ROAD SUITE 200 JACKSONVILLE, FL 32256 OFFICE (904) 733-9119 FAX (904) 733-9570 License No. 000072</div> <div>CH2MHILL 9428 BAYMEADOWS ROAD SUITE 200 JACKSONVILLE, FL 32256</div>	SHEET TITLE		
DATE	BY	DESCRIPTION					BRIDGE TYPICAL SECTION		
FIGURE 7			CHECKED BY				ROAD NO.	COUNTY	FINANCIAL PROJECT ID
			DESIGNED BY						
			CHECKED BY				PROJECT NAME	LPGA BLVD. OVER I-4	SHEET NO.
			APPROVED BY						

A bridge-type wildlife crossing structure was also developed in conceptual detail and would be conservative given its higher costs compared to the box culvert alternative. The proposed bridge crossing requires an approximately 50-foot horizontal clearance and approximately 8-feet of vertical clearance. A bridge with end slopes would be approximately 80-feet long, from front face backwall to front face backwall. A bridge with vertical end walls would be approximately 62 feet long from front face backwall to front face backwall. A conceptual plan and elevation for this bridge can be seen in Figure 8.

For bridges of this length there are various superstructure, substructure and approach options that will be considered during final design. A two- or three- span flat slab bridge is a viable alternative. A one span AASHTO beam bridge may also be considered for a crossing of this magnitude. The typical section of this crossing will be the same as the bridge over I-4. As with the I-4 crossing, the location of the bridge within the proposed right of way will be such that future widening could be easily accomplished. The approximate construction costs associated with this wildlife bridge is \$338,000 and approximately \$269,000 in special wildlife fencing for a total estimate of \$607,000. *Appendix “C” shows bridge construction cost estimates.*

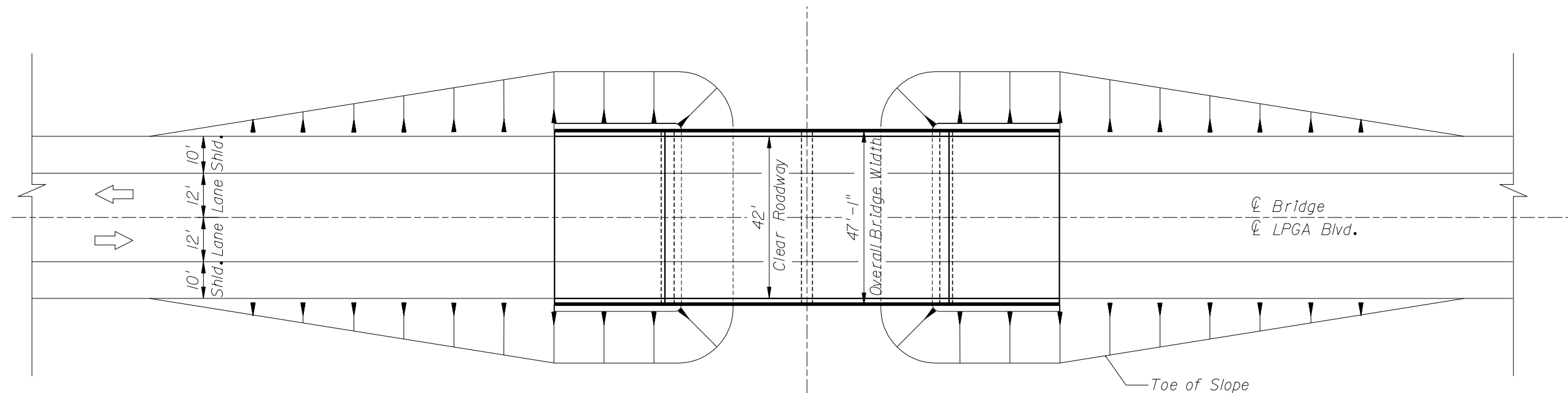
ALIGNMENT DEVELOPMENT

In association with the Madeline Extension study, an initial alignment for LPGA Boulevard was developed by Volusia County that showed LPGA Boulevard directly connecting with the Madeline Avenue Extension. This alignment was used as a starting point in the development of the initial feasibility alignment to be used in this study. It is important to note that a detailed investigation of potential alignment alternatives was **NOT** conducted for this study. Should this project progress to the PD&E phase, this evaluation will be conducted following the NEPA process.

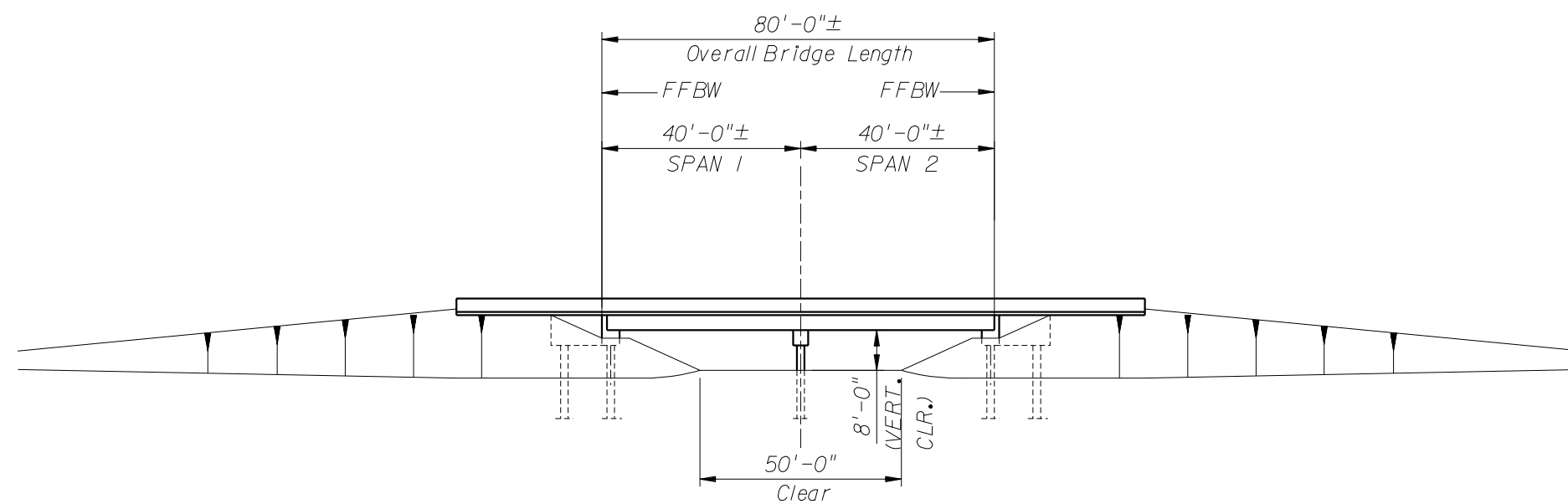
To show a different potential alignment from that study by Volusia County, a new LPGA alignment was established tying into CR 415 directly, as shown in the Volusia County MPO 2020 Long Range Transportation Plan-Refinement. This alignment would not serve as a continuation of Madeline Avenue, but would form a continuous connection with CR 415 to the south. Figure 9 shows this study alignment for the LPGA Boulevard Extension. Following FDOT roadway design standards, the LPGA alignment was developed for a 55 mph design speed. Some adjustments to the Volusia County alignment were made to keep superelevation off the Interstate overpass bridge, and provide full superelevation transitions.

At the southern end of the LPGA Extension alignment, a perpendicular intersection with the Madeline Avenue Extension is created by extending Madeline Avenue from CR 415 along the Shunz Road corridor. A T-intersection could be established with sufficient tangent along Madeline Avenue to provide sufficient sight distance and enhance the overall safety of the intersection.

Two potential alignment options were investigated with relation to the intersection of CR 415 and the LPGA Extension. The options were guided by a desire to shift traffic away from CR 415 (Tomoka Farms Road), which has congestion issues north of Interstate 4, and onto the proposed LPGA Boulevard Extension. One alternative called for CR 415 to be cul-de-sac south of the LPGA Boulevard and Madeline Avenue Extension intersection, forcing access between LPGA and CR 415 southbound to occur via the Madeline Avenue Extension. Due to a lack of support from local government this cul-de-sac alternative was not advanced.



PLAN

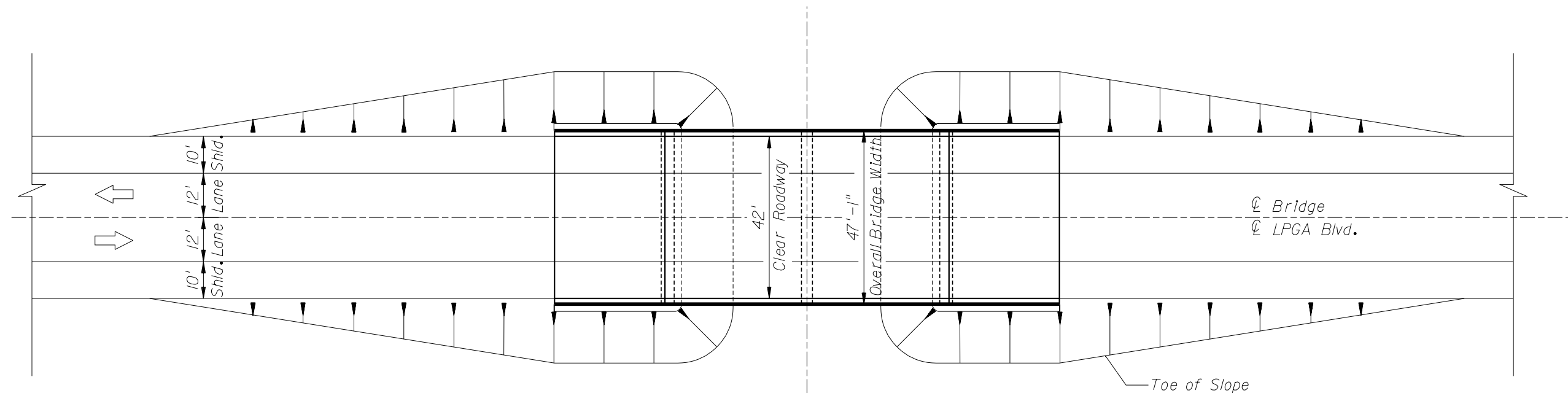


ELEVATION

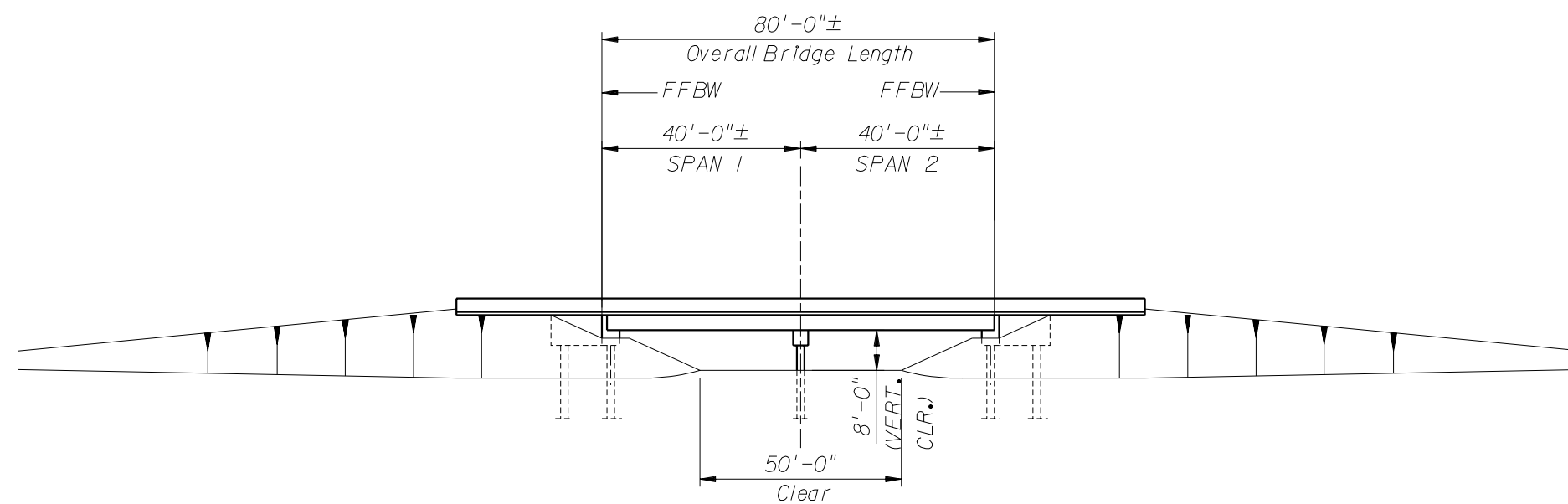
Option Shown - 2 Span with Endslopes

FIGURE Z

REVISIONS			NAMES	DATES	ENGINEER OF RECORD			SHEET TITLE		
DATE	BY	DESCRIPTION			CH2M HILL			PLAN AND ELEVATION - WILDLIFE CROSSING		
		FIGURE 8	DRAWN BY		9428 BAYMEADOWS ROAD SUITE 200 JACKSONVILLE, FL. 32256 OFFICE (904) 733-9119 FAX (904) 733-9570 License No. 000072			PROJECT NAME: LPGA BLVD. OVER I-4		
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PLAN

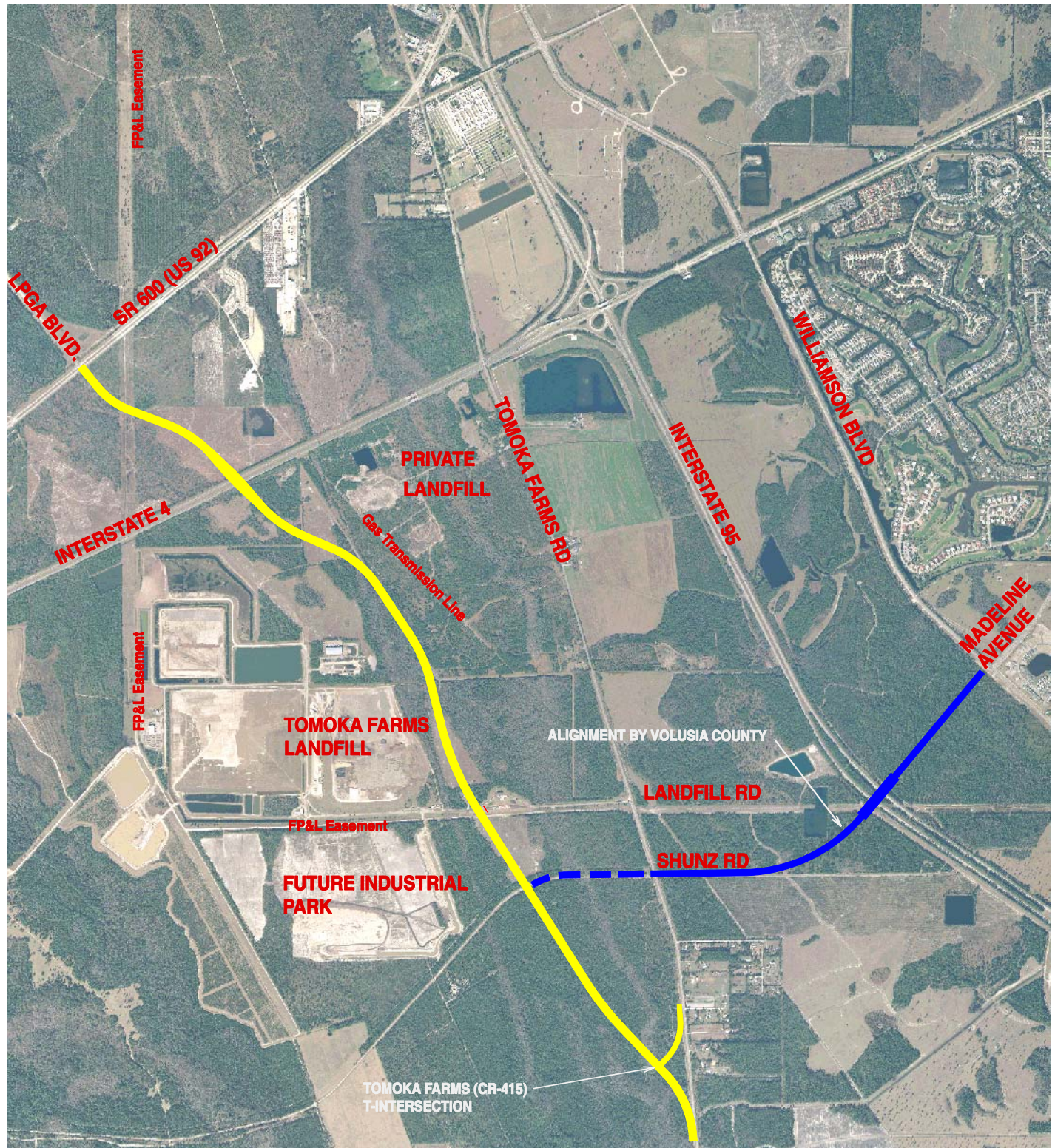


ELEVATION

Option Shown - 2 Span with Endslopes

FIGURE Z

REVISIONS			NAMES	DATES	ENGINEER OF RECORD			SHEET TITLE		
DATE	BY	DESCRIPTION			CH2M HILL			PLAN AND ELEVATION - WILDLIFE CROSSING		
		FIGURE 8	DRAWN BY		9428 BAYMEADOWS ROAD SUITE 200 JACKSONVILLE, FL. 32256 OFFICE (904) 733-9119 FAX (904) 733-9570 License No. 000072			PROJECT NAME		
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			DESIGNED BY					LPGA BLVD. OVER I-4		
			CHECKED BY							
			APPROVED BY							



LPGA EXTENSION ALIGNMENT
VOLUSIA COUNTY FLORIDA

The study alignment option that was advanced and studied entailed CR 415 shifting southwesterly and forming a new T-intersection with the LPGA Boulevard Extension. This new intersection with CR 415 would carry trips from LPGA to the Madeline Avenue Extension directly. Under this alignment it would be only necessary to construct the Madeline Avenue/Shunz Road Extension westerly to CR 415, with the remaining portion of the Madeline Avenue Extension (as identified in the Madeline Avenue Extension Study, Reference 5) to also be constructed on a County discretionary basis. This alignment would allow an LPGA Extension to function as more of a regional roadway, serving north/south traffic that is presently utilizing CR 415. *Appendix “D” contains the LPGA Extension concept plans.*

DRAINAGE

The topography within the study corridor is relatively flat. Overland flow of runoff is toward the east into the Tomoka River and its tributaries. In addition, the limits of the Outstanding Florida Waters (OFW) for the Tomoka River begin at I-4 and include the project area north of I-4.

The overall approach to stormwater management is to provide conveyance to stormwater treatment ponds via ditches and storm sewer. The combination of ditches and storm sewer is suggested in order to minimize the embankment required to meet ditch clearance requirements with respect to seasonal high groundwater. Based on a review of available soils information, the seasonal high groundwater elevation is assumed to be at the ground surface.

For the purposes of this Feasibility Study, ponds have been sized to accommodate a future expansion of the proposed two-lane roadway to a four-lane typical section. The system was developed with the objectives of minimizing property impacts and complying with OFW criteria. A total of five pond sites totaling 43.15 acres would be required to provide treatment and attenuation of stormwater runoff from the proposed roadway. This includes the additional volume required to offset the impact the proposed roadway would have on the 100-yr flood plain. The approximate right-of-way required to provide these stormwater ponds is provided below in Table 3.

Table 3 LPGA Pond Sizes

Pond Name	Right-of-Way Area (ac)
Pond A	17.6*
Pond B	9.77
Pond C	5.77
Pond D	6.01
Pond E	3.99
Total All Ponds	43.15*

* 9.65 acres for additional floodplain compensating storage

Floodplains

A significant portion of the proposed project is located within the floodplain associated with the Tomoka River. The impacted floodplain is designated as Zone A; therefore the base flood elevations and flood hazard factors have not been determined for this floodplain. In order to define a preliminary 100-year floodplain elevation, and thus quantify the anticipated impact to the

floodplain, the FEMA floodplain line was superimposed over the USGS map for the area. Based on this method, the estimated elevation of the 100-year floodplain is 25 feet.

The next step in quantifying the impact to the floodplain is to determine the depth of impacted floodplain. Impact is calculated using the distance between the 100-year floodplain elevation and the existing ground surface or the seasonal high water table (whichever is greater). In this case, we have assumed that the seasonal high water elevation is located at the existing ground elevation. It is assumed that the average existing ground elevation throughout the proposed roadway corridor is 24 to 25 feet, or an average of 24.5 feet. The area of the corridor that is located within the 100-year floodplain is estimated at 13,800 linear feet, with a 150-foot corridor for an impact area of 47.52 acres. With an impact depth of 0.5 foot, the volume of displaced floodplain is approximately 23.76 acre-feet.

St. Johns River Water Management District criteria for the Tomoka River basin includes strict regulation regarding the reduction in available 100-year floodplain; specifically, the project may not cause a net reduction in flood storage within the 100-year floodplain. The proposed project would need to include mitigation for the displaced floodplain within designated floodplain compensation ponds in conjunction with the treatment ponds. It is noted that approximately 9.4 acres of pond area has been added in Table 3 for floodplain compensating storage requirements. This is in addition to the volume available in the treatment ponds.

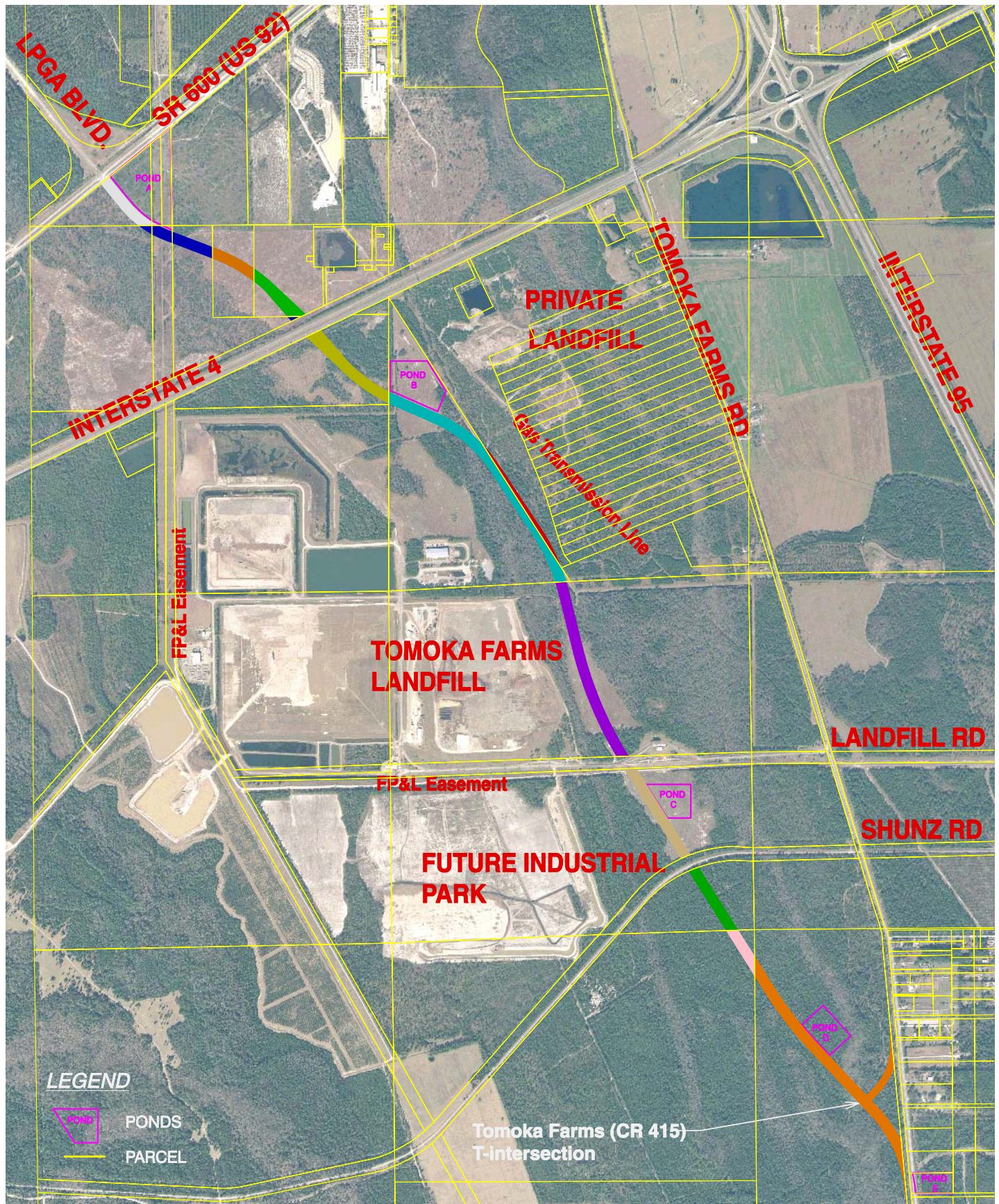
RIGHT-OF-WAY

As part of this feasibility study, a broad-level general investigation of the parcel impacts and associated costs was conducted. As discussed previously, although initial traffic volumes do not warrant a facility larger than two-lanes, Volusia County has adopted policy to provide adequate right-of-way for the future expansion of higher classification roadways to four lanes or greater. Although a two-lane facility is being studied as the potential improvement, the sizing and placement of ponds will accommodate a future four-lane facility. Under the assumption that the future four-lane facility would follow the FDOT “suburban typical” section within 150 feet of right-of-way, the roadway would impact approximately 66.88 acres of land over the 3.78-mile corridor. An additional 43.15 acres would be required for stormwater retention/floodplain compensating storage ponds, yielding a total right-of-way impact of 110.03 acres for the project. A vast majority of this property is publicly owned lands. Figure 10 shows the approximate right-of-way impacts to individual parcels.

As a basis for comparison, an estimate of right-of-way impacts for a two-lane facility within a 100-foot corridor was also developed. The results of this right-of-way cost evaluation for constructing the LPGA Boulevard extension under each of these assumptions is provided below:

- 100-foot Right of Way.....\$ 3,906,000
- 150-foot Right of Way.....\$ 4,362,000

Appendix “E” contains detailed right of way cost estimate information worksheets.



LPGA PARCEL IMPACT
VOLUSIA COUNTY FLORIDA

UTILITIES

There are a number of areas along the proposed LPGA corridor where utility impacts could be realized. At the US 92 intersection, there is an existing gas main (TECO-Peoples Gas), AT&T fiber optic cable, Florida Power & Light (FPL) distribution powerline, and City of Daytona Beach force main along US 92. In addition, there is a City of Daytona Beach force main that goes north along LPGA from US 92. Depending on the specific intersection improvements, which are implemented with the road project, the existing utilities at the LPGA Boulevard/US 92 intersection may be impacted.

Just south of US 92, the proposed road corridor crosses an existing Florida Power & Light (FPL) transmission easement, which contains overhead power lines. Depending on the point where the proposed roadway corridor crosses the easement, the power poles and overhead cables may be impacted. Possible impacts may be minimized if there is some flexibility to the road geometry such that the road alignment could be adjusted to avoid a direct conflict with a power pole. Should a direct conflict with a power pole exist and there be no flexibility to road geometry, the power pole would need to be relocated.

South of I-4, the proposed road corridor crosses the landfill entrance road and a second FPL transmission easement near the Tomoka Farms Road Landfill site. At this location, there are existing FPL overhead distribution lines and FPL overhead transmission lines. Again, a potential conflict may arise between the road alignment and a power pole. Should a conflict arise and there be no flexibility to the road alignment, the power pole would need to be relocated.

Just south of the landfill entrance road, the proposed road corridor crosses Shunz Road. The City of Port Orange has existing water mains and reclaimed water mains along Shunz Road. Depending on the intersection geometry for LPGA Boulevard and Shunz Road, the roadway improvements may impact the existing Port Orange water mains and reclaimed water mains. Should impacts occur, the water mains and reclaimed water mains will need to be relocated.

The south extension of the proposed LPGA corridor terminates at Tomoka Farms Road south of Shunz Road. Existing utilities along Tomoka Farms Road include overhead power lines and aerial telephone cables. Depending on the intersection location and geometry, the proposed road improvements may conflict with an existing power pole. Should a conflict arise, the power pole would need to be relocated.

In summary, initial estimates indicate that the utilities relocation associated with the LPGA Extension would be in the neighborhood of \$150,000. This is assuming two FPL poles would need to be relocated at approximately \$40,000 a piece and 3 intersections that would require utility tie in work at an estimated \$25,000 each.

ROADWAY CONSTRUCTION COSTS

Roadway constructions cost estimates were developed using the FDOT Long Range Estimating System. Basic elements included in the FDOT LRE analysis included:

- Project length of 3.78-miles

- Significant fill to elevate the entire roadway 5 feet above natural ground (to achieve proper drainage);
- All pavement and base materials, signing and striping;
- Signal costs for three new traffic signal installations;
- Maintenance of traffic and mobilization, and
- Contingency factor of 15%

While LRE bridge costs were developed for this study, a separate analysis yielded cost figures that were slightly more detailed. As such, the independent estimate has been included in this total. The grand total roadway construction cost estimate from the LRE analysis is approximately \$12,222,000. At 3.78-miles in project length, this is about \$3,233,000 dollars per mile of construction. *Appendix “F” contains the detailed LRE construction cost estimate worksheets.*

PRELIMINARY PROJECT COST SUMMARY

The preliminary cost summary ties together all the associated cost estimates for the right-of-way purchase, design, roadway and bridge construction, utilities, and construction engineering inspection. At the Feasibility Study stage, all facets of the projected cost cannot be determined with exacting detail. However, through this evaluation the major cost components have been estimated to produce a reasonable overall project cost. This cost will provide guidance to decision makers in determining the feasibility of this project. Table 4 provides a summary of the preliminary project costs to construct a two-lane roadway in either 100-ft or 150-ft of right-of-way. As stated earlier, providing for a future expansion to a four-lane facility in keeping with the Volusia County policy for this type of facility will require 150-ft of right-of-way. The total cost estimates for the 100-foot and 150-foot right-of-way project scenarios are approximately \$21.5 million and \$21.9 million dollars, respectively.

Table 4 Preliminary Project Cost Summary

Cost Description	100-foot right-of-way	150-foot right-of-way
Right-of-Way	\$3,906,000	\$4,362,000
Design	\$2,200,000	\$2,200,000
Roadway Construction	\$10,359,000	\$10,359,000
Bridge Construction	\$1,863,000	\$1,863,000
Utility Costs	\$150,000	\$150,000
Wetland Mitigation Costs ¹	\$1,139,000	\$1,139,000
Construction Engineering Inspection ²	\$1,833,000	\$1,833,000
Grand Total	\$21,450,000	\$21,906,000

¹ Wetland mitigation costs assume a 2004 cost of \$88,300/acre for 12.9 acres of mitigation. This is based on constructing a 2-lane roadway in either 100-ft or 150-ft of right of way.

² Construction Engineering Inspection is assumed to be 15% of roadway construction + bridge costs based on previous experience with similar projects.

Section 5

Environmental Impacts

Environmental Impacts

This section of the LPGA Boulevard roadway feasibility study summarizes the results of a preliminary environmental evaluation conducted in support of the proposed LPGA Boulevard extension project in Volusia County, Florida. The purposes of this evaluation are to characterize local environmental resources that may be affected by the project, and to provide a preliminary, desktop quantification of associated wetland impacts.

The following issues are addressed in this memorandum:

- Wetlands
- Water quality
- Wildlife and Habitat
- Outstanding Florida Waters
- Wild and Scenic Rivers
- Aquatic Preserves

The wetland assessment includes a brief project description, discussion of methods used in this exercise, characterization of ecological communities that may be affected, and a summary table quantifying community types and potential wetland impacts.

Water quality data for the nearest Tomoka River sampling station was summarized and the Water Management District ranking of the River at the site described.

The Wildlife and Habitat sections provide information on federal and state-listed species and specific information associated with Bald Eagle and Florida Black Bear habitat and occurrence in the general project area.

The project area is within the Tomoka River hydrologic basin, and the status of the project area with respect to Outstanding Florida Waters, Wild and Scenic Rivers, and Aquatic Preserve designations was considered.

Hydrologic and Soil Conditions

Soils

The project area is almost entirely within the Tomoka River Basin boundaries and within the 100-year floodplain for those waters (Figure 11).

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.

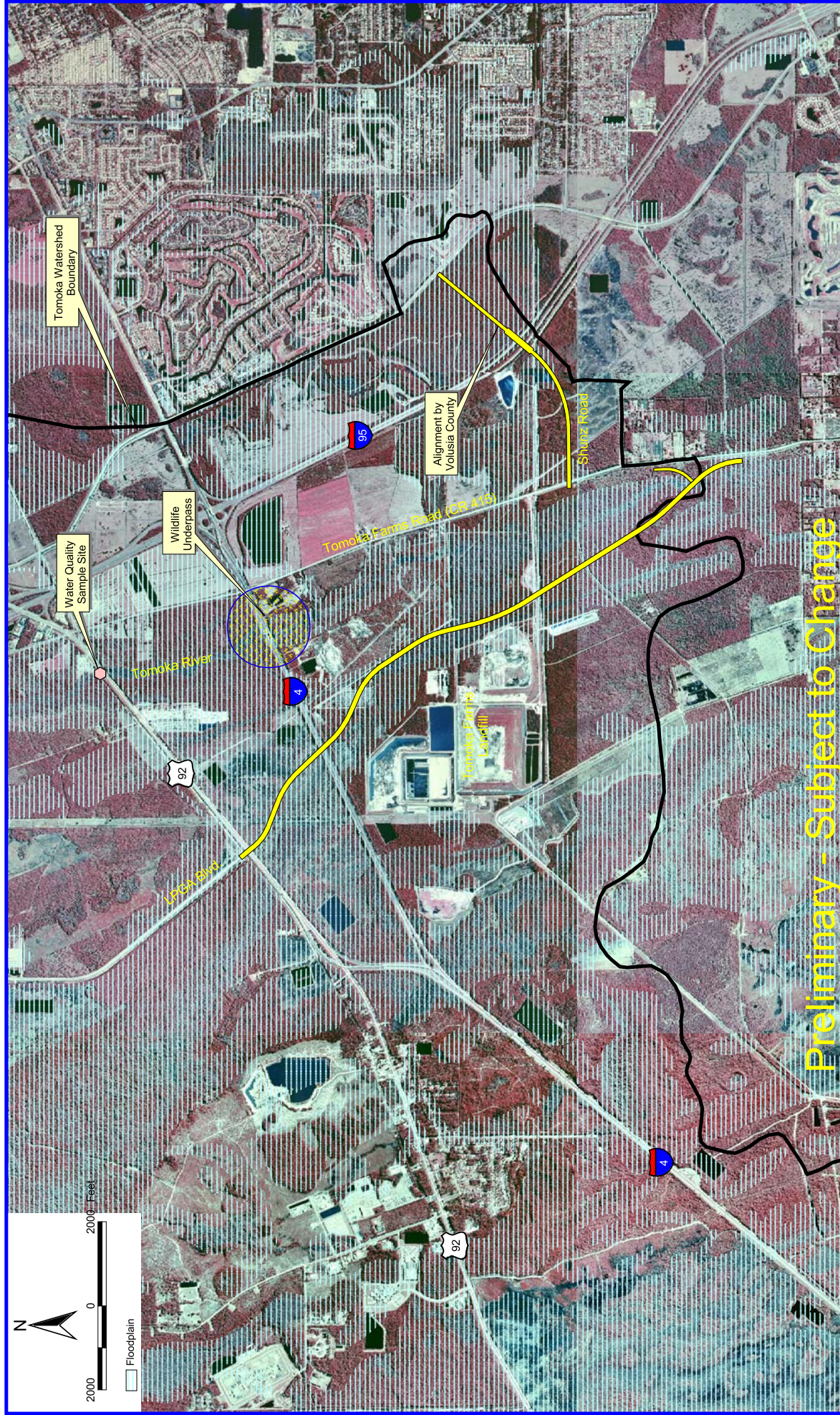


Figure 11
Proposed Project Corridor and Infrastructure in the General Area

Floodplain

The proposed project is located within the floodplain associated with the Tomoka River. The impacted floodplain is designated as Zone A. Therefore the base flood elevations and flood hazard factors have not been determined for this floodplain. In order to define a preliminary 100-year floodplain elevation, and thus quantify the anticipated impact to the floodplain, the FEMA floodplain line was superimposed over the USGS map for the area. Based on this method, the estimated elevation of the 100-year floodplain is 25 feet NGVD.

The next step in quantifying the impact to the floodplain is to determine the depth of impacted floodplain. Impact is calculated using the distance between the 100-year floodplain elevation and the existing ground surface or the seasonal high water table (whichever is greater). In this case, we have assumed that the seasonal high water elevation is located at the existing ground elevation. It is assumed that the average existing ground elevation throughout the proposed roadway corridor is 24 to 25 feet, or an average of 24.5 feet. The area of the corridor that is located within the 100-year floodplain is estimated at 18,000 LF, with a 100-foot corridor for an impact area of 41.32 acres. With an impact depth of 0.5' the volume of displaced floodplain is approximately 20.66 ac-ft.

St. Johns River Water Management District criteria for the Tomoka River basin includes strict regulation regarding the reduction in available 100-year floodplain; specifically, the project may not cause a net reduction in flood storage within the 100-year floodplain. Therefore, mitigation for the displaced floodplain is proposed within the stormwater treatment ponds.

Wetlands

Methods

The following documents were reviewed and used to characterize community types and calculate potential wetland impacts:

- False color infrared aerial photographs (SJRWMD, January 26, 1999);
- Volusia County Soil Survey (US Soil Conservation Service, 1980);
- National Wetland Inventory Maps, ([NWI], US Fish and Wildlife Service, 1981, adapted by SJRWMD); and
- Florida Land Use, Cover and Forms Classification System ([FLUCFCS], FDOT, 1999).

To quantify potential wetland areas, 100-foot and 150-foot project corridor widths and the NWI wetland maps were digitally transposed onto the aerial photograph of the project site (Figure 12). Wetland areas within the corridors were quantified. Soils maps of the corridor areas were evaluated for hydric soils as mapped in the Volusia County Soil Survey (1980).

Vegetation community types were characterized from interpretation of aerial photographs and FLUCFCS codes in NWI maps.

Vegetation Community Types

Wetland forest (FLUCFCS 630) and freshwater marsh (FLUCFCS 641) systems are the prevalent wetland habitats crossed by the proposed project. Typical vegetative species in the forested wetlands are sweet bay (*Magnolia virginiana*), loblolly bay (*Gordonia lasianthus*), and red maple (*Acer rubrum*) in the canopy; fetterbush (*Lyonia lucida*), wax myrtle (*Myrica cerifera*), St. Johns wort (*Hypericum* spp.) in the understory, and blue maidencane (*Amphicarpum muhlenbergia*), panic grasses (*Panicum* spp.), and wire grasses (*Aristida* spp.) as groundcover. Slash pine (*Pinus elliotii*), gallberry (*Ilex glabra*), and saw palmetto (*Serenoa repens*) are common in the adjacent upland areas.

Herbaceous wetlands are typically dominated by flag species such as pickerel weed (*Pontedaria cordata*) and duck potato (*Sagittaria latifolia*) in depressional areas, and hydrophytic graminoids such as maidencane (*Panicum hemitomon*), rushes (*Juncus* spp.) and sedges (*Carex* spp.) at slightly higher elevations. These marshes frequently have a shrub component, with St. Johns wort, Carolina willow (*Salix caroliniana*), and buttonbush (*Cephalanthus occidentalis*) as common woody species.

Descriptions of ecological communities within the project corridor will be refined when a field survey of the project area is conducted.



Figure 12
National Wetland Inventory (NWI) Maps Superimposed on an
Aerial Photograph of the Project Corridor and Immediate Environs

Wetland Impacts

Wetlands comprise 12.9 acres (Table 5 Wetland area 100-foot corridor) or 19.6 acres (Table 5: Wetland 150-foot corridor) This is about 26 percent of the total project area for both the 100-foot and 150-foot right-of-way alternatives. Of the wetlands affected, most (more than 80 percent) are forested. All stormwater management is expected to be developed in areas defined as uplands and thus will not provide any additional wetland impact.

TABLE 5
Wetland Impact Areas for the proposed LPGA Boulevard extension corridor options

Community Type	Impact Area (Acres)	
	100 foot	150 foot
(FLUCFCS Code 641)* Herbaceous Marsh	2.3	3.4
(FLUCFCS Code 630) Forested Wetland	10.6	16.2
Total Wetland Area	12.9	19.6

* Includes mixed herbaceous and scrub-shrub systems

Agency Coordination

The proposed project has been discussed with regulatory agency staffs of the St. Johns River Water Management District (SJRWMD), Florida Fish and Wildlife Conservation Commission (FFWCC), Florida Department of Environmental Protection (FDEP), the Army Corps of Engineers (USACE), and the National Marine Fisheries Service (NMFS). The SJRWMD will likely be the lead state agency for the Florida Environmental Resources Permit Application review, with state agency review of and input from FFWCC and FDEP. The USACE coordinates federal agency inputs for the Federal Section 404 Permit Application, which will also be submitted as part of the project. Inputs from USFWS and NMFS are likely to be the primary federal agencies providing significant comments on that permit application.

Both state and federal agency staffs expressed concern about the location of the proposed roadway for the following reasons:

- The habitat is generally relatively high quality forested wetland that is becoming increasing scarce in that basin and region.
- The roadway would impact the availability of the habitat to the Florida Black Bear
- A lack of sites available in the immediate area to mitigate the project.
- A high potential for impact to the Tomoka River OFW and the Tomoka Marsh Aquatic Preserve.

The NMFS indicated that the project would be evaluated for impacts associated with essential fish habitat. The location of the Tomoka Marsh Aquatic Preserve and the function of the upstream

wetlands of the Tomoka River in water quality conditioning was stated as an issue of key project concern of the NMFS.

Each agency expressed the opinion that the multiple impacts would make a satisfactory environmental resolution for the project difficult.

Mitigation of Wetland Impacts

Mitigation for wetland impacts will be developed through 373.4137 F.S. (Florida Senate Bill 1986). This enacted legislation allows FDOT to fund Water Management District development and execution of mitigation for unavoidable impacts of FDOT projects through an escrow account funded by the FDOT. Current year per acre cost for mitigation under this statute is \$86,149. Costs are likely to increase in future years due to the quality of the habitat impacted and the scarcity of mitigation for such habitat in that basin (Lisa Grant, SJRWMD, personal Communication January 2004).

Water Quality

Water quality data (Table 6) indicate that the Tomoka River at the US 92 bridge (downstream of the general Project area) is typically clear but highly colored, with relatively low levels of nutrients and total suspended solids. The data for orthophosphate, available as part of the data record, were not included here because the PO₄-P levels were an order of magnitude higher than total P values, and above likely levels for the conditions otherwise described in the water quality data. Nutrients, chlrophyll a, total coliform and fecal coliform counts were all typically within ranges associated with relatively unpolluted waters.

TABLE 6

Water Quality Data, Tomoka River upstream of US 92. Identified by Volusia County as site TR-05. Data provided by Volusia County Environmental Health Laboratory, www.volusiahealth.com/lab
Data are summary statistics for sampling period of record reported – January 1992 - March 2002 except as noted in the table.

Parameter	Units	Median	Maximum	Minimum	Mean	95% CI	# of samples
Color	CPU	190	740	55	239	40	53
Turbidity	mg/L	2.90	41.00	0.90	5.25	1.97	53
TSS	mg/L	3.00	180.00	0.40	8.93	7.19	52
TKN	mg/L	1.49	11.67	0.67	1.83	0.42	52
NO _x	mg/L	0.01	0.09	0.00	0.01	0.00	53
TN	mg/L	1.52	11.68	0.68	1.84	0.42	52
NH ₄	mg/L	0.10	2.80	0.02	0.23	0.12	53
TP	mg/L	0.05	0.90	0.00	0.08	0.03	53
Pheophytin A	ug/L	0.00	0.92	0.00	0.17	0.16	13*
Chlorophyll a	ug/L	0.20	1.16	0.00	0.33	0.21	13*
Chlorophyll C	ug/L	80.00	940.00	10.00	174.62	141.29	13*

TABLE 6

Water Quality Data, Tomoka River upstream of US 92. Identified by Volusia County as site TR-O5. Data provided by Volusia County Environmental Health Laboratory, www.volusiahealth.com/lab
Data are summary statistics for sampling period of record reported – January 1992 - March 2002 except as noted in the table.

Total Coliforms	CFU	170	940	20	271	166	13*
Fecal Coliforms	CFU	53	4,680	0	273	198	54
Enterococcus	CFU	170	3,260	0	416	181	52

*Period of record: August 1997 – March 2002

The SJRWMD rates the river at this sampling site as “fair”, with a water quality index (WQI) value of 47.2. The WQI is based on a period of recorded data for total suspended solids (TSS), dissolved oxygen, total organic carbon, total and fecal coliform bacteria, total phosphorus, total nitrogen, total nitrite/nitrate, and turbidity. There is yet an insufficient data record to calculate a trend statistic for the data (Aisa Ceric, SJRWMD, personal communication January 2004).

Specific and relatively stringent requirements may be placed on a construction project in this area to avoid, minimize, and manage water quality impacts in the river floodplain area. However, at this time it seems unlikely that water quality issues would result in a permit denial for such a project.

Special Status Issues

Introduction

The Federal and Florida State governments have a variety of designations for aquatic ecosystems that have been identified as outstanding quality, or as very natural, or as preserves for wildlife and habitat purposes. This section identifies special designations of the land and waters associated with the project area.

Outstanding Florida Waters (OFW)

Immediately downstream (north) of the I-4 corridor and bridge over the Tomoka River Basin is designated an Outstanding Florida Water (OFW) (SJRWMD 2003, Figure 11). If the roadway corridor north of I-4 impacts wetlands contiguous with the Tomoka River it will be considered as impacting an OFW. If an application for an Environmental Resources Permit (ERP) is submitted the appropriate regulatory agency will determine whether or not the project is in or partly in the Tomoka River OFW. Because of the close proximity of the project to the Tomoka River OFW, it is assumed for planning and construction purposes that the project is within the OFW basin, and is subject to applicable OFW guidelines and restrictions. The OFW designation results in closer scrutiny before a permit is issued (Florida Department of Environmental Protection 2004):

For projects in an OFW, an applicant must provide reasonable assurance that the project is clearly in the public interest. In determining public interest, the Department or District shall consider and balance whether the project will:

- adversely affect public health, safety, welfare or property of others;
- adversely affect conservation of fish and wildlife, including endangered or threatened species or their habitats;
- adversely affect navigation or the flow of water or cause harmful erosion or shoaling;
- adversely affect fishing or recreational values or marine productivity in the vicinity of the project;
- be of a temporary or permanent nature;
- adversely affect significant historical or archaeological resources; and
- adversely affect the current condition and relative value of functions performed by the wetlands.

The roadway as currently conceived would likely be able to meet the regulatory constraints described above if designed with these issues in mind.

Wild and Scenic Rivers

The Tomoka River north of I-4 is designated a Florida Wild and Scenic River (FDOT 2004). Construction of the proposed roadway is unlikely to affect this Wild and Scenic River status. If the SJRWMD determines that the project is within the boundaries of the Wild and Scenic portion of the Tomoka River, the District would coordinate with the National Park Service and documentation of the impact or lack thereof would be required. The project would not appear to impact the river according to the designation's primary measures: altering its free flowing nature, altering the setting, or resulting in a deterioration of water quality (FDOT 2004).

Aquatic Preserves

While there are no Aquatic Preserves in the project area, The Tomoka Marsh Aquatic Preserve is downstream of the project area in the estuary of the River. The Preserve will likely have to be considered in any cumulative impact analysis of the roadway on water quality should the project move forward (Tomoka Marsh Aquatic Preserve 2004, Brenda Borgiet, FDEP, Personal Communication February 2004). At this time no direct impacts to the Aquatic Preserve are expected to result from project activities.

Wildlife and Habitat

The habitats associated with the project corridor and in the surrounding area consist primarily of forested wetland, mixed with forested and disturbed uplands and herbaceous wetlands. The general aquatic ecosystems in the area are recognized as relatively undisturbed and thus have some higher likelihood of containing species of special concern. The area is known to contain several eagle nests, and is part of the habitat area for the central Florida population of the Florida black bear.

There are a number of federally listed species found in Volusia County (Table 7 – listed Species, Figure 13). Of those listed, the only species known to be present or potentially impacted by the roadway is the Bald Eagle. A list of “rare” species and important habitats known or believed to be present in Volusia County developed by the Florida Natural Areas Inventory is provided in

Appendix 1. That list would be used to guide field survey efforts in any further environmental investigation of the area.

Several bald eagle nests are within the general project area. USFWS guidelines for habitat impact evaluation suggest that a primary zone of at least 750 feet to 1500 feet radius around the nest and a secondary zone at least 1500 feet radius to a mile radius around the nest should be considered in evaluating potential impacts (USFWS 1987). The northern terminus of the proposed corridor is about 1500 feet from the nearest eagle nest (Figure 13). None of the other bald eagle nests in the area (Figure 13) are within one mile of the proposed corridor.

The location of the proposed corridor with respect to the nearest bald eagle nest was discussed with an FFWCC bald eagle expert (Steven Nesbitt Personal Communication 2003) of the FFWCC. He noted that the nest was still considered active even though it has not been used for nesting the last two nesting seasons (nests used within the past five years are considered active). He noted that the FFWCC uses the Bald Eagle Habitat Management Guidelines (US Fish and Wildlife Service 1987) in evaluating proposed roadway impacts on bald eagles, and that the general description of the roadway location with respect to the nest suggested that those impacts would be relatively small. He indicated that the FFWCC and the USFWS would have to evaluate a permit application in order to make an official statement concerning impacts and any actions necessary on the part of the applicant.

A large number of bald eagles, both adults and immature birds are reported to regularly use the Tomoka River Landfill as a hunting area (Josef Grusauskas, Personal Communication, January 2004). If the project is further developed an evaluation of any secondary impacts on the eagles associated with the proposed roadway may need to be considered.

TABLE 7

USFWS (2000) Listed Plant and Animal Species in Volusia County August 7, 2000

**Listed "includes federal designations of Threatened, (T) Endangered (E) and Critical Habitat (CH)*

Category	Species Common Name	Species Scientific Name	Code
Mammals	West Indian (Florida) Manatee	<i>Trichechus manatus latirostris</i>	E/CH
	Bald Eagle	<i>Haliaeetus leucocephalus</i>	T
	Everglade Snail Kite	<i>Rostrhamus sociabilis plumbeus</i>	E
Birds	Piping Plover	<i>Charadrius melodus</i>	T
	Florida Scrub-jay	<i>Aphelocoma coerulescens</i>	T
	Wood Stork	<i>Mycteria americana</i>	E
	Red-cockaded Woodpecker	<i>Picoides borealis</i>	E
Reptiles	Eastern Indigo Snake	<i>Dymarchon corais couperi</i>	T
	Green Sea Turtle	<i>Chelonia mydas</i>	E
	Hawksbill Sea Turtle	<i>Eremochelys imbricata</i>	E

	Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	E
	Loggerhead Sea Turtle	<i>Caretta caretta</i>	T
	Atlantic Salt Marsh Snake	<i>Nerodia clarkii</i> (=fasciata)taeniata)	T
Plants	Rugel's Pawpaw	<i>Deeringothamus rugelii</i>	E

Since the roadway corridor only minimally increases access to the nesting area (it touches the 1500-foot boundary line tangentially) the general location of the roadway does not seem a likely reason for permit denial. The FFWCC would likely recommend that the construction activities in that area be adjusted to avoid critical eagle nesting times.

The Florida Black Bear (*Ursus americanus floridanus*) is one of three subspecies of American black bear found in the southeastern United States. While not federally listed as a threatened or endangered species, it is recognized by the State of Florida as a species of Special Concern. Black bears are protected throughout Florida except those in Baker and Columbia counties and Apalachicola National Forest. The western end of the project area is part of the primary range for the bear (primary ranges are areas where bears are consistently documented). Secondary ranges are areas where bears have been documented, but sporadically. Secondary ranges are important not just for the additional habitat they provide bears, but because they serve as travel routes which connect larger populations (Wildflorida.org 2004).

A number of bear kills have been recorded near the present terminus of LPGA Boulevard on US 92, and in the adjacent area of I-4 (Figure 13). The entire project area is considered secondary range for the bear. The bears may be attracted to the project area because of the Tomoka Landfill that is immediately adjacent to the proposed corridor. The I-4 Bridge over the Tomoka River is being modified to include an underpass for bear and other wildlife along the river corridor to reduce the bear traffic-related deaths in the area. That underpass will provide the bears unimpeded access to the project corridor.

The FFWCC has been involved in black bear issues associated with a number of recent transportation projects in the area. Experts within that organization have been providing expertise for those projects and are very familiar with the site of the proposed project and the bear population activity in the area. The following paragraph is a summary of a telephone discussion about the project, which focused on the bear habitat issues and possible solutions (Terry Gilbert, 2004 Personal Communication).

The loss of habitat in general, and creation of a cul-de-sac with the construction of the proposed roadway are primary concerns of the FFWCC for this project. The proposed corridor would impact the bears by creating a roadway through habitat used by the bears, increasing the likelihood of injury or death through a collision with a vehicle. The proposed roadway will result in the creation of a triangular area of bear habitat bounded by roadways on all sides: US 92 to the north, Tomoka Farms Road to the east and the proposed corridor to the west. After entering the area a bear would have to cross over a public roadway to leave. This creates a greater hazard than a bear would encounter without the presence of the proposed corridor. He indicated that it appeared that at least one wildlife corridor would likely be necessary, and other infrastructure such as fencing, would also likely be necessary to provide protection for the bears.

Based on the discussion with FFWCC, modification of the roadway may likely be necessary to ensure that the bears are protected from the traffic on the new road, and that the area continues to be fully available as secondary habitat for the animals. Such modifications might include those similar to the SR 46 wildlife underpass. This culvert allows bears (and other wildlife) movement across the roadway. As part of the design, high fencing that prevents animals from crossing the roadway except through the wildlife passage structure may be appropriate as well.

The SR 46 underpass built by FDOT is a bear-friendly, dirt-floor box culvert, 47 feet- (14.3 m-) long by 50 feet- (15.4 m-) wide by 8 feet- (2.4 m-) high (Figure 14). The road over the crossing was elevated to give skittish animals a clear view across to the other side. Rows of pines were planted in the open pasture on one side of the road to guide bears to the culvert entrance (Federal Highway Administration 2004). High chain link fencing on both sides of the road guides animals into the passageway.

A single underpass of this sort along the corridor south of the Tomoka Farms Landfill would allow bears to pass to the west without crossing an active public highway. Fencing along the east edge of the proposed corridor would stop the bears from crossing the roadway to reach the landfill.



Wildlife Underpass along SR 46, Lake County.

Picture copied from <http://www.flhwa.dot.gov/environment/wildlifecrossings/bear.htm>

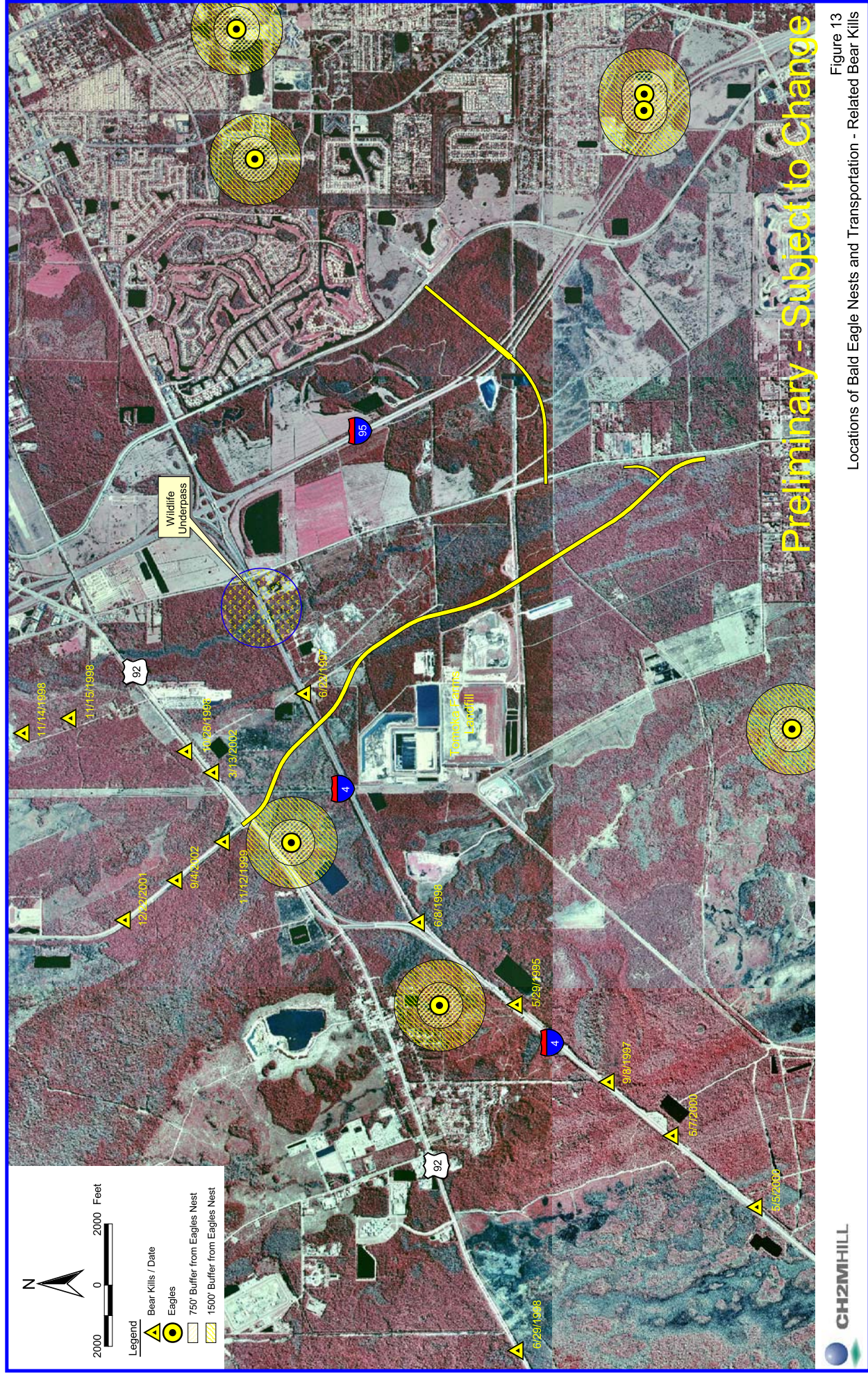


Figure 13
Locations of Bald Eagle Nests and Transportation - Related Bear Kills

Summary

The proposed corridor presents a number of environmental issues for regulatory consideration:

- The environment impacted by the proposed corridor is in the Tomoka River watershed, within the 100-year floodplain of the Tomoka River.
- The proposed corridor north of I-4 is within the Tomoka River OFW basin.
- A large portion of the impacted wetlands is forested secondary habitat for the Florida Black Bear, a Florida Species of Special Concern.
- The northern end of the proposed corridor intersects the secondary habitat zone of an American Bald Eagle nest.

The combination of impacts and the high wildlife habitat values of the project area present a complex set of issues to resolve during the regulatory process. Each one of the expected impacts has regulatory concern and no one issue alone would likely present a regulatory barrier to the project. The combined impacts will have greater influence on regulatory decisions than any one of the issues considered alone.

Section 6

Public Involvement

Public Involvement

A Public Involvement Plan was prepared for this project in compliance with the Florida Department of Transportation's Project Development and Environment Guidelines; Florida Statute 339.155; Executive Orders 11990 and 11988; CEQ Regulations for Implementing the Procedural Provisions of the Natural Environmental Policy Act; and FHWA Order 5610.1C.

Coordination Meetings

Several coordination meetings have been held to inform the local governments and developers of the project and to gather existing information related to the project. Individual meetings were held with Volusia County Staff (including representatives from Public Works, Engineering, Traffic and Solid Waste divisions), the Volusia County Metropolitan Planning Organization (MPO), the City of Port Orange, the City of Daytona Beach, representatives from the First Baptist Church and representatives of the Consolidated-Tomoka Land Company.

Two traffic coordination meetings were also held to coordinate the traffic modeling efforts that would be performed for the project and included discussions on existing and future land use, planned roadway improvements and the various roadway network alternatives that should be modeled. The traffic coordination meetings included representatives from Volusia County, the Cities of Port Orange and Daytona Beach, the Volusia County MPO and members of the Study Team. Table 5 provides information on the project coordination meetings that have been held to date.

Public Workshop

A Public Information Workshop was held on Thursday, January 29, 2004 at the Port Orange Regional Library, 1005 City Center Circle, Port Orange, Florida. The workshop was conducted in an open-house format from 6:00 pm to 8:00 pm and was attended by 15 residents/property owners. Project information was displayed and included existing and future land use information, alternative roadway alignments on aerial background, proposed typical sections and traffic/roadway network information.

A presentation was made beginning at 7:00 pm, which included an overview of the purpose of the workshop, the purpose of the LPGA Boulevard Extension Feasibility Study, an overview of the need for the project, the typical roadway cross sections being considered, an overview of potential impacts and costs and a discussion of the project schedule. A question and answer session was held following the presentation. A summary of the questions and responses is included.

Comment 1: *Why does the yellow alignment (Volusia Co. MPO 2020 LRTP-R alignment) extend to CR 415 south of Shunz Road instead of stopping at Madeline Avenue?*

Response 1: The purple alignment shown this evening does show the LPGA Boulevard Extension connecting to Madeline Avenue. However, one of the benefits of the LPGA Boulevard Extension is to provide an alternative to I-95 for local north-south traffic. The alignment that continues southward beyond Madeline Avenue that connects to CR 415 better facilitates this north-south traffic flow.

Comment 2: *Why does the southern end of the LPGA Boulevard Extension alignment connect to CR 415 where several homes are built?*

Response 2: The alignment used to determine preliminary impacts and costs for the feasibility study is from the Volusia County MPO's 2020 Long Range Transportation Plan-Refinement. If this project is found to be feasible, a much more detailed Project Development and Environment (PD&E) Study will be conducted. This alignment and others will be evaluated in more detail and we will be sure to review the connection to CR 415 with this alignment.

Comment 3: *Which of the two alternative alignments shown this evening has more wetland impacts?*

Response 3: We did not determine impacts and costs for both alignments. We only determined costs and impacts for Volusia County MPO's 2020 LRTP-R alignment since it is longer and would result in more conservative numbers. Those details would be determined during the PD&E Study and put into a comparative matrix that is presented to the public.

Five written comment forms were filled-out and submitted at the workshop and five were received following the workshop. A summary of the comments received is provided below.

- I do not want to see new roads west of I-95, which will lead to sprawl development. More high-speed roads will threaten wildlife and increase road kills. You cannot build your way out of congestion. I support the No Build option.
- As a design engineer for the First Baptist Church development, I support the proposed corridors. A new road will be constructed between Williamson Boulevard and CR 415 as part of the City of Port Orange "new town" development, which will intersect CR 415 just south of the proposed connection of the LPGA Boulevard Extension to CR 415. These two intersections will not have adequate spacing. Please contact me for a copy of the plans for this new roadway.
- The residents of the area should have been involved in this feasibility study earlier instead of at the end of the study. This project will bring unwanted development to our rural lifestyle.
- I prefer the alignment that connects the LPGA Boulevard with Madeline Avenue over the alignment that connects to CR 415 where homes are built.
- The planned extension of LPGA Boulevard is being done to facilitate the development of lands owned by Consolidated Tomoka Land Company. The continued sprawl will further degrade the quality of life for residents of this area.
- Is it Port Orange's idea to build a new road through conservation lands? I am opposed to development west of I-95 and prefer to see mass transit instead of another road that destroys wetlands.
- Who owns the land that the proposed extension will be built on and is it just being done so that development can occur? I am opposed to this road adjacent to conversation lands unless public need can be demonstrated.
- I am opposed to this road. We are losing too many valuable ecosystems to strip malls.
- I am opposed to the project because the extension will cut through environmentally sensitive land and dump more cars onto SR 415 to the detriment of the Conservation Corridor. The

answer to congestion is not more roads. We should encourage public transportation, light rail, buses and car-pooling.

- A new road through rural, undeveloped land will change the function of that land forever. It will destroy wetlands and will no longer serve us as wildlife habitat, water recharge or open land and forest. Roads focus growth around themselves and fragment habitat. More and wider roads do not reduce congestion, they bring more cars. When considering new roads, environmental concerns should be given the highest priority.

In addition to written comments, several comments were made during individual conversations with study team members and are summarized below:

A meeting attendee said that the Coraci development is moving forward with design plans being prepared that include a new road connecting to CR 415. The intersection of this road with CR 415 is just south of where the Volusia County MPO's 2020 LRTP-R alignment curves to connect CR 415, which may create an intersection spacing problem (same as second bullet in "written comments").

Property owners from some larger tracts (5 acres +) located along CR 415 south of the study area, voiced concern about the extension of LPGA Boulevard to CR 415 inducing more traffic to the rural character of their area.

Several individuals who stated that they lived south of the project area expressed concern about the Volusia County MPO's 2020 LRTP-R alignment as having a greater impact on the wetlands in the area. They also expressed their belief that the roadway would hasten what they saw as the "drying up" of Spruce Creek.

Josef F. Grusauskas, Director, Solid Waste Division, Public Works Department, County of Volusia provided the following information.

- Bald eagles are commonly seen at the landfill. He stated that as many as 70 have been seen at one time. They use the site to hunt for seagulls, and he had observed both adults and young at the site.
- He believed that there were other nests in the area that were not represented on the map.
- He had not seen any bears during his tenure at the landfill.
- He pointed out that a hunt club was located just south of the Volusia landfill. He asked if they had been contacted.
- He stated that the watershed divide between Spruce Creek (draining south) and the Tomoka River Watershed (draining north) was located along the Landfill Road. He located the Tomoka landfill ERP permit sampling point at the Tomoka River weir along landfill road.

Myron Kirton and his daughter indicated their approval with the study alignment alternative shown. They supported deemphasizing the north-south traffic along Tomoka Farms Road by diverting this onto an extension of LPGA Boulevard. They also responded favorably to having a small portion of the required right-of-way encroaching on their property running adjacent to the tangent section just north and east of the Tomoka landfill property (parcel 6203-00-00-0040). They would like to establish an access to their property from the west in the area where the LPGA extension comes through.

One resident thought that the project was motivated by developers and businesses such as the car dealership at the intersection of I-95 and the existing LPGA Boulevard.

Several people indicated that it would be helpful to show additional aerial coverage to the south and identify some of the intersecting streets along Tomoka Farms Road to the south of where the extension would tie in. This would help them get a better feel for the proximity of the extension to Taylor Road and others.

Table 5 LPGA Boulevard Extension Project Coordination Meetings

Date	Attendees	Location	Purpose
November 5, 2003	City of Port Orange Community Development Director, Study Team members	City of Port Orange City Hall	Project kickoff and coordination
November 10, 2003	Volusia County Staff, FDOT, Study Team members	Volusia County Admin. – Public Works	Project kickoff and coordination
November 11, 2003	Volusia County MPO, Study Team members	Volusia Council of Governments, MPO Conference Room	Project kickoff and coordination
November 11, 2003	Consolidated Tomoka, Indigo Development, Study Team members	Consolidated-Tomoka Land Co. offices in Daytona Beach	Project kickoff and coordination
November 11, 2003	City of Daytona Beach, Study Team members	City of Daytona Beach, Development Services Conference Room	Project kickoff and coordination
November 13, 2003	Zev Cohen & Associates (First Baptist Church Representative), Study Team members	Zev Cohen office, Ormond Beach	Data Collection
November 20, 2003	Volusia County, FDOT, Volusia County MPO, City of Daytona Beach, City of Port Orange, Study Team members	City of Port Orange City Hall, 2 nd Floor Conference Room	Traffic coordination
December 18, 2003	Volusia County, FDOT, Volusia County MPO, City of Daytona Beach, City of Port Orange, Study Team members	City of Port Orange City Hall, 2 nd Floor Conference Room	Traffic coordination follow-up meeting
January 15, 2004	Volusia County MPO, FDOT, Study Team members	Volusia Council of Governments, MPO Conference Room	Traffic coordination
January 29, 2004	Volusia County, FDOT, Volusia County MPO, City of Daytona Beach, City of Port Orange, Study Team members, property owners along the corridor	Port Orange Regional Library	Public Information Workshop
February 17, 2004	Volusia County MPO TCC, Study Team members	Volusia County MPO Conference Room	Project presentation
February 17, 2004	Volusia County MPO CAC, Study Team members	Volusia County MPO Conference Room	Project presentation
March 23, 2004	Volusia County MPO Board, Study Team Members, FDOT	VOTRAN office	Project presentation

Volusia County MPO TCC & CAC Presentations

On Tuesday, February 17, 2004, the results of the feasibility study were presented to the Technical Coordinating Committee (TCC) and the Citizens Advisory Committee (CAC) of the Volusia County Metropolitan Planning Organization (MPO). A presentation was made which included an overview of the project, the purpose of conducting the feasibility study, results of the preliminary analysis and an overview of the public involvement activities held during the feasibility study. Both the TCC and the CAC approved the requested action to proceed on to the Project Development & Environment (PD&E) Study phase of the project.

Volusia County MPO Board Presentation

The results of the feasibility study were also presented to the Volusia County MPO Board on Tuesday, March 23, 2004. The same presentation that was given to the TCC and CAC was made to the MPO Board. Once again, the recommendation to proceed to the PD&E Study phase of the project was approved by the MPO Board.

Section 7

Conclusions and Recommendations

Conclusions and Recommendations

Based on the results of this LPGA Boulevard Extension analysis, the following findings and recommendations are made with regard to this proposed roadway:

FINDINGS

Traffic Forecast Model Projections

- Based on the 2030 AADT traffic volume forecasts, the LPGA Boulevard Extension would be justified as a two-lane facility given the projected land uses, socioeconomic data and planned future roadway networks.
- A variety of roadway networks were modeled resulting in volumes as high as 20,000 AADT. This volume may warrant a four-laned roadway.

Engineering Evaluation & Alignment

- A two-lane typical section was developed based on the 2030 AADT model projections.
- Ponds and right of way for the LPGA Extension would be developed for a four-lane ultimate design, consistent with Volusia County policy.
- A 55-mile per hour design speed was assumed to stay consistent with similar roadway facilities in the region. This would require a 150-foot width of right-of-way to support a potential future four-lane roadway, with a 100-foot construction impact limit for the initial LPGA Extension as a two-lane facility. Right-of-way and construction of the two or four-lane facility would be subject to available funding.
- Under the LPGA alignment developed for this study, the Madeline Avenue Extension has been shown ending at CR 415 with a T-intersection. To provide connectivity with the proposed LPGA extension, Volusia County could continue Madeline Avenue to the west to form a T-intersection with LPGA Boulevard.
- For the purposes of this Feasibility Study, ponds have been sized to accommodate a future expansion of the proposed two-lane roadway to a four-lane roadway. The system was developed with the objectives of minimizing property impacts and complying with OFW criteria. A total of five pond sites totaling 33.5 acres would be required to provide treatment and attenuation of stormwater runoff from the proposed roadway. The proposed project would need to include mitigation for approximately 23.8 acre-feet of displaced floodplain using floodplain compensation ponds in addition to the treatment ponds. Increasing the total pond area by 9.65 acres will provide for floodplain compensating storage volume. This results in a total required pond area of 43.15 acres.
- Right-of-Way impacts for either alternative alignment of the LPGA Extension would occur on sixteen tax-lot parcels, affecting nine different property owners (three public, six private). A majority of the right-of-way required for the roadway extension is on public land. Approximately 100 acres would be associated with right-of-way acquisition for the feasibility alignment.

- The grand total roadway construction cost estimate, including bridge work, for the LPGA Boulevard Extension is approximately \$12,200,000. This estimate was produced using the FDOT LRE system and utilized input from the project team.
- The total non-construction cost estimate, including design, right-of-way purchase, utilities, construction engineering inspection, and wetland mitigation totals to \$9.25 or \$9.7 million, depending on 100- or 150-foot right-of-way.
- Preliminary project cost summary, which includes design, roadway and bridge construction, right-of-way purchase, utilities, construction engineering inspection, and wetland mitigation totals between \$21 and \$22 million, depending on 100- or 150-foot right-of-way requirements.

Environmental Impacts

- The wildlife habitat values of the project area present a set of issues to resolve during the regulatory process. Each one of the expected impacts has regulatory issues and no one issue alone would likely present a regulatory barrier to the project. However, the combined impacts will have greater influence on regulatory decisions than any one of the issues considered alone.

Public Involvement

- A Public Involvement Plan was prepared for this project in compliance with local, state and federal requirements. The Public Involvement Plan entailed coordination meetings with local government and major developers within the study area to individually review the project feasibility study and issues. A public involvement workshop was held on behalf of the LPGA project for all interested parties at the Port Orange Regional Library on the evening of January 29, 2004.

RECOMMENDATIONS

Based on the results of the analysis summarized in this report, it is recommended that the extension of LPGA Boulevard be continued forward into a detailed Project Development and Environmental Study (PD&E) for further analysis.

These recommendations were presented to the Volusia County MPO Technical Coordinating Committee (TCC) and Citizens Advisory Committee (CAC) on February 17, 2004 and the full MPO Board on March 23, 2004. Each of these elements of the Volusia MPO concurred with the recommendation to move forward into the PD&E process.

Section 8

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Appendix A

LPGA Plan Review Summary

MEMORANDUM

Date: November 21, 2003

Project #: 6052

To:

From: Shaun Quayle

Project: LPGA Extension Feasibility Study

Subject: LPGA Plan Review

Volusia County MPO TIP Projects near Study Site...

- **I-4** from SR 44 to I-95, widening to 6 lanes, federally funded for project engineering, environmental, and right-of-way, FY 2003/04 and FY 2007/2008
- **CR 415** from SR 44 to US 92, widening study, impact fee and local gas tax funded, FY 2002/03
- **Madeline Av.** West from CR 415 to Williamson Blvd, 2ln/4ln, impact fee and local gas tax funded, -engineering (05/06), ROW (06/07), Construction (07/08)
- **Madeline Av.** Alignment Study, west extension to CR 415 from Williamson Blvd, alignment study, impact fee and local gas tax funded – ENG (02/03)
- **I-95** from SR 44 to south of I-4, add lanes and repave, federally funded, preliminary engineering 2006 & 2008.
- **I-4 & I-95** ITS Freeway Management, work scheduled for 2004.
- **US 92 (SR 600)** Resurfacing from I-4 to Bellevue Road. Work is scheduled for 2005.
- **Tomoka Farms Rd/Bellevue Road** Intersection Safety Project, work is scheduled for 2005.
- **Dunn Av** from Tomoka Farms Rd to Williamson Blvd, construct new 2-lane road. Engineering 2003/04, ROW 2004/2005, and construction 2005/06.

- **LPGA Blvd** Bridge widening at the Tomoka River. Engineering phase is scheduled for 2004/05.

Volusia County MPO LRTP

Chapter 4 – Land Use data. The LPGA extension site area is categorized in the plan as part of the “central” planning region. Sources for future land use assumptions include...

- The adopted land use plans of Volusia County and the various communities therein;
- Projections of countywide population prepared by the University of Florida Bureau of Economic and Business Research (BEBR);
- Projections of population by sub area within Volusia County prepared by the Volusia County Growth Management Department;
- A gravity model-based growth allocation spreadsheet and,
- Review and comment by local government planning staffs.

Development of future year socio-economic data was accomplished in three steps; establish countywide totals (population, housing and employment), allocation of population to sub areas, and allocation of population and employment to the TAZ level.

From 1997 numbers, the population within the central region of the county is projected to grow 158% by 2010 and 290% by 2020. Further details are available in Chapter 4 of the LRTP.

LRTP Projects near Study Site...

PHASE 2 – 2006 TO 2010

- **I-4 @ LPGA Blvd** new interchange.
- **Dunn Av** extension as a 2-lane road from LPGA to Williamson Blvd
- **LPGA Blvd** extension as a 2-lane road from Tomoka Farms Rd to US 92.

PHASE 3 – 2011 TO 2020

- **I-95** from Brevard County to US 92, widen to 6 lanes.
- **LPGA Blvd** from I-95 to Clyde Morris Blvd widen to 6 lanes
- **LPGA Blvd** from Tymber Creek Rd extension to I-95 widen to 4 lanes

- **Taylor Road (CR 421)** extension as a 2-lane road from I-4 to Tomoka Farms Rd.
- **Taylor Road (CR 421)** widen to 4 lanes from Tomoka Farms Rd to Williamson Blvd.
- **Williamson Road** widen to 4-lanes from Taylor Rd to Beville Rd.

Unfunded Projects in the Need Assessment

- **Dunn Av** from LPGA Blvd to Williamson Blvd, widen to 4 lanes.
- **Tomoka Farms Rd** from US 92 to LPGA Blvd, extension of 2-lane road.
- **Tomoka Farms Rd** from LPGA/Madeline Av extension to US 92, widening to 4-lanes.
- **Tomoka Farms Rd** from Taylor Rd to LPGA/Madeline extension, widening to 4-lanes.
- **Williamson Blvd** from Beville Rd to US 92, widening to 6-lanes.

Volusia County Thoroughfare Plan – 5 year Road Program

- **Tomoka Farms Road** Extension is listed as pending on the map. The reason for this is that it was approved by the County Council but has not been approved by the state ("non-compliance status").
- **Williamson Blvd** Extension South from Airport Road to Pioneer Trail is adopted on the East side of I-95. It is currently under study and is likely to be found to function best on the west side of I-95. This modification would then need to be approved by County Council, which is likely to occur.
- **Rhode Island** Extension west from the Proposed Westside Parkway to US 17/92 will likely be added in the next year. The school board is building three school sites on this future road. (Not shown on TFARE figure).
- **Dunn Avenue** Extension west to Tomoka Farms from Williamson Blvd, 2 lane construction with 4 lane ROW, construction 2005 to 2007.
- **LPGA Blvd** – Tomoka River Bridge widening. Construction 2007/08.
- **Madeline Avenue** west extension to CR 415 (Tomoka Farms Rd) from Williamson Blvd. Construction 2007/08.
- **Tomoka Farms Rd/Bellevue Road** intersection project. Construction 2004/05.

Daytona Beach Comprehensive Plan

Future Land Use Element:

- Neighborhood T
 - Areas adjacent to the Tomoka River are considered high value environmentally sensitive wetlands and should be protected. These areas should be preserved through intelligent development techniques such as P.U.D. or cluster zoning and a wetlands ordinance.
 - Because the area between I-4 and Tomoka River is highly visible, the City shall encourage light industrial uses at this location, but shall prohibit outside storage. The City's Land Development Code shall provide for 50' scenic setbacks along the interstate and shall not permit additional billboards.
 - Auto Mall uses may extend southward into the General Industry area located west of I-4 south of the LPGA interchange, but only under a number of conditions. These include adequate ped facilities between dealerships, the extension of Tomoka Farms Road to meet criteria already established for the existing Auto Mall project, and the proposed extension of Dunn Road would serve as the southern limit of potential Auto Mall expansion.
 - The LPGA Boulevard Interchange at I-4 shall provide a new entrance to the City. The City's Land Development Code shall provide for a minimum 50' scenic setback, ground monument signs, and consistent architectural and landscape themes. Easements within the setback shall be landscaped in accordance to City's approved plan.
 - Permitted uses along LPGA Blvd shall include light industrial, offices, tourist accommodations, Level 3 residential with a minimum density of 25 dwelling units per acre, and commercial retail.
 - Dunn Avenue extension will make this area highly visible being a major roadway through this area, and scenic setbacks shall be established for this area.
 - A minimum of 12% and maximum of 30% of the total area designated as mixed use within the combination of neighborhoods K,S,T and U shall be developed as residential with a minimum of 15 units per acre and a maximum of 25 units per acre.
- Neighborhood U
 - Areas adjacent to the Tomoka River are considered high value environmentally sensitive wetlands and should be protected. These areas should be preserved through intelligent development techniques such as P.U.D. or cluster zoning and a wetlands ordinance.

- The City and Consolidated Tomoka Land Company are in a partnership to develop the area from I-95 to LPGA Blvd. This area will be developed primarily as a single-family residential neighborhood with some Level 2 residential uses and a municipally professionally designed golf course. Commercial zoning will be limited to neighborhood and community shopping centers and offices. Retail commercial development shall be designed in a certain unified manner to ensure limited access to major roads, limited signage, unified landscaping and stormwater management.
 - Because the area between I-4 and Tomoka River is highly visible, the City shall encourage light industrial uses at this location, but shall prohibit outside storage.
 - On West International Speedway Blvd, the City shall ensure that large medians are preserved, as the road is 6-laned. The City shall provide landscaping within the medians, soliciting contributions from the community.
 - Because the area along I-95 is highly visible, the City shall encourage light industrial and office uses at this location, with outside storage prohibited. The City's Land Development Code shall provide for 50' scenic setbacks along the interstate and shall not permit additional billboards.
 - Permitted uses along LPGA Blvd shall include light industrial, offices, tourist accommodations, Level 3 residential with a minimum density of 25 dwelling units per acre, and commercial retail.
 - Dunn Avenue extension will make this area highly visible being a major roadway through this area, and scenic setbacks shall be established for this area.
 - A minimum of 12% and maximum of 30% of the total area designated as mixed use within the combination of neighborhoods K,S,T and U shall be developed as residential with a minimum of 15 units per acre and a maximum of 25 units per acre.
 - Commercial development northwest of the intersection of the US 92/Tomoka Farms Road should be undertaken with careful attention to possible impacts on the Tomoka River and traffic at this intersection. Development shall be processed under the planned development provisions of the Land Development Code.
- Neighborhood V
 - With areas located west of Bennett Swamp, development should be limited to achieve consistency with the City's future holding capacity, to create an orderly transition from undeveloped to urban to ensure adequate urban services are available and also provide environmental protection to natural resources. The Urban Transition strives to protect wetlands and other resources, discouraging urban sprawl in an interim holding, and remain consistent with other City plans.

- In western areas of the City, future land use designations are more conceptual and flexible than designations in the eastern areas.
- The City has come to endorse findings that Rima Ridge is not a prime recharge (or zone change from rural wetland to urban) area, but development will be in such a manner to facilitate a controlled recharge.
- Future development within this neighborhood is generally restricted, some limited development will be appropriate in the vicinity of Indian Lake Road and the County's facilities which exist in this area.
- Some limited development is appropriate along the north side of West International Speedway Blvd in the vicinity of the access ramp to Interstate 4. Development should be limited to preserve the integrity and function of the environmentally sensitive lands in this area. The future land use designation for the 58.7 acre area located on Old Deland Road, approximately one half mile west of LPGA Blvd, is designated as "General Industry", but shall further be restricted with regards to allowable FAR and restrictions related to handling or storage of hazardous substances.

Future Transportation Map Projects Shown (All Projects Represent Year 2010 Future):

- **LPGA Blvd** southern extension from International Speedway Blvd down past Madeline Avenue west extension.
- **Madeline Avenue** western extension to LPGA Blvd extension, past Tomoka Farms Rd.
- **LPGA Blvd** extensions north and west (north of International Golf Dr. and west of Champions Dr.) for an undisclosed length and ultimate alignment.
- **Tomoka Farms Rd** extension north of International Speedway Blvd up to east-west portion of LPGA Blvd.
- **Dunn Av** extension west of Jimmy Ann Dr over to LPGA Blvd.
- **Unnamed Loop Rd** from LPGA Blvd to International Speedway Blvd, through the Consolidated Tomoka Development property.
- **Tomoka Farms Rd/Madeline Av/LPGA Blvd.** intersections realignments. Tomoka Farms Rd will be realigned to T-intersect with Madeline Av extension. This will occur west of new LPGA extension alignment with Madeline Av to facilitate a smoother major traffic movement on LPGA (which is currently on Tomoka Farms Rd. as the major movement).

City of Port Orange Comprehensive Plan

Future Land Use Element:

- As a growth management strategy, balance the focus of development between new development in western Port Orange and efforts to redevelop and revitalize the older portions of the City.
- The Williamson Blvd/I-95 sub region has a planned Stanaki PCD (150,000 sq. ft.) development, and proposed Cypress Head Center (140,000 sq. ft.) and Sabal Creek Center (100,000 sq. ft.) developments listed in the comp plan.
- As an objective, the City shall assert a high priority to the marketing and development of a business/industrial park west of I-95 through policy.
- As another objective, the City shall work with Volusia County and adjacent jurisdictions to develop a system of incentives and disincentives which encourage a separation of urban and rural land uses while protecting water supplies, resource development, and fish and wildlife habitats.

Transportation Element (All are required 2015 Improvements):

2001-2010

- **Williamson Blvd/Madeline Av** construction of a new traffic signal.

2010-2015

- **Interstate 95** widen to 6-lane divided section, from Pioneer Trail to North City Limits.
- **Taylor Road** extension as a 4-lane, divided section from Williamson Blvd/Airport Rd. to Western City Limits.
- **Williamson Blvd** widen to 4 lanes with median from I-95 to Airport Rd.
- **Williamson Blvd** add two lanes w/median from Taylor Rd to northern City limits.
- **N-S Collector** construct two-lane roadway from Shuntz Rd to Taylor Rd.
- **N-S Arterial** construct two-lane roadway from Shuntz Rd to Williamson Blvd
- **E-W Collector** construct two-lane roadway from Williamson Blvd to Tomoka Farms Rd.
- **Shuntz Road (Yorktowne Blvd)** construct two-lane roadway from Hidden Lakes Drive to Tomoka Farms Rd.

Appendix B

Future Traffic Forecasts

		Year 2025 AADT																		
Roadway		Segment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6	Alt 7	Alt 8	Alt 9	Alt 10	Alt 11	Alt 12	Alt 13	Alt 14	Alt 15	Alt 16	Alt 17	Alt 18
I-95		South of Taylor Road (S.R. 421)	81,500	81,300	81,400	81,300	81,600	81,500	81,300	81,300	80,700	80,700	80,700	80,700	81,300	81,300	80,700	81,100	80,800	81,100
		South of Beville Road (S.R. 400)	95,000	93,300	94,300	93,200	94,000	94,200	93,200	93,200	93,500	93,200	92,300	93,000	94,400	93,200	92,400	94,000	92,400	93,300
		South of U.S. 92	131,900	138,500	128,300	138,900	140,100	140,400	138,500	138,900	139,700	139,300	137,200	137,900	128,100	139,000	137,200	139,100	137,300	138,200
		South of LPGA Boulevard	114,500	114,300	114,200	114,900	113,100	114,000	114,200	115,100	119,000	118,900	117,800	117,100	114,100	115,000	117,900	115,900	117,400	115,400
		South of S.R. 40	128,200	127,600	128,000	127,800	127,600	127,500	127,300	126,500	125,900	126,200	124,100	126,100	128,200	126,600	126,300	125,700	126,300	131,600
		South of U.S. 1	115,000	115,100	115,000	115,000	115,000	114,800	114,800	114,900	115,000	114,900	114,800	114,800	114,900	114,900	115,000	114,800	114,900	115,000
Tomoka Farms Road (S.R. 415)		South of Taylor Road (S.R. 421)	17,200	17,600	17,400	17,700	16,600	16,900	17,600	17,600	17,000	17,100	17,100	17,500	17,900	17,200	16,200	17,400	16,600	
		South of LPGA Boulevard Extension	0	0	11,000	10,900	0	7,600	0	10,900	10,400	10,500	10,600	10,500	11,000	11,100	0	0	10,700	7,300
		South of Madeline Avenue Extension	10,600	10,700	6,900	7,500	6,000	1,000	10,700	7,500	7,200	7,300	7,000	7,000	6,900	7,600	10,300	5,600	7,000	1,000
		North of Madeline Avenue Extension	7,500	7,400	6,200	6,700	0	0	7,400	6,700	6,500	6,500	6,300	6,200	6,200	6,700	6,900	0	6,200	0
		South of Bellevue Avenue	9,600	9,900	8,200	9,200	2,500	2,500	9,900	9,200	9,000	8,900	8,600	8,600	8,200	9,200	9,300	2,300	8,600	2,400
		South of U.S. 92	9,600	9,700	8,200	8,900	2,400	2,400	9,600	9,000	8,800	8,700	8,400	8,400	8,200	9,000	9,100	2,300	8,400	2,300
		South of Dunn Avenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		South of LPGA Boulevard	100	100	100	100	100	100	100	100	100	100	100	100	100	100	200	200	100	100
		South of Hand Avenue Extension	0	0	0	0	0	0	0	0	0	0	0	200	0	0	100	200	200	200
		South of S.R. 40	0	0	0	0	0	0	100	600	0	1,000	0	2,500	0	0	2,500	2,600	2,500	5,000
Williamson Boulevard (C.R. 4009)		North of Taylor Road (S.R. 421)	17,800	18,200	17,800	18,100	18,900	18,900	18,300	18,200	18,300	18,400	18,500	18,600	17,900	18,200	18,500	19,200	18,500	19,100
		South of Madeline Avenue	13,000	13,700	13,100	13,700	14,500	14,500	13,700	13,700	13,800	14,000	14,200	14,000	13,100	13,700	14,100	14,700	14,100	14,700
		South of Beville Road (S.R. 400)	8,900	9,000	8,800	9,000	9,700	9,700	9,000	9,100	9,200	9,200	8,500	8,500	8,800	9,000	8,500	9,100	8,500	9,000
		South of Bellevue Avenue	11,600	14,000	11,600	14,100	14,800	14,700	14,100	14,100	13,900	13,900	14,400	14,400	11,500	14,100	14,400	15,100	14,400	15,000
		South of U.S. 92	16,200	16,300	16,100	16,400	17,100	17,000	16,400	16,400	16,300	16,300	16,300	16,200	16,200	16,300	16,200	16,900	16,300	16,900
		South of Dunn Avenue	15,400	15,600	15,300	15,600	15,700	15,700	15,600	15,600	16,500	16,600	14,500	14,700	15,400	15,500	14,800	15,600	14,800	15,600
		South of LPGA Boulevard	56,200	56,400	56,000	56,500	57,400	56,400	56,200	56,300	61,200	61,400	56,800	57,200	56,000	56,400	57,200	58,000	57,100	58,200
		South of Hand Avenue	38,200	38,200	38,300	38,200	38,400	38,400	38,200	38,200	39,300	39,100	43,700	44,500	38,100	38,200	44,400	44,900	44,400	40,600
		South of S.R. 40	43,200	43,100	43,300	43,200	43,300	43,300	43,100	42,500	45,300	45,000	51,000	50,100	43,200	43,100	49,900	50,400	49,900	47,900
Clyde Morris Boulevard (S.R. 483)		North of Taylor Road (S.R. 421)	37,500	37,500	37,900	37,500	38,900	37,900	37,500	37,400	37,400	37,600	38,000	37,300	37,900	37,500	37,900	39,000	38,100	38,700
		South of Madeline Avenue Extension	37,700	37,800	38,100	37,700	39,200	38,200	37,700	37,700	37,700	37,500	37,600	38,100	37,400	38,100	37,800	38,100	39,100	38,200
		South of Beville Road (S.R. 400)	49,300	49,400	49,700	49,300	51,200	50,000	49,500	49,500	49,200	49,300	49,600	48,900	49,700	49,500	49,600	50,700	49,700	50,600
		South of Bellevue Avenue	44,400	45,200	44,400	45,200	45,600	45,400	45,200	45,200	44,700	45,100	44,900	44,700	44,500	45,200	44,800	45,300	44,800	45,300
		South of U.S. 92	45,300	45,500	45,300	45,600	45,900	45,800	45,500	45,500	45,700	46,100	45,700	45,400	45,300	45,500	45,600	46,100	45,500	45,800
		South of Dunn Avenue	8,300	8,300	8,400	8,300	8,300	8,400	8,300	8,300	10,900	11,000	10,100	9,300	8,400	8,300	10,100	9,300	9,200	9,300
		South of LPGA Boulevard	15,800	15,800	15,800	15,300	15,800	15,800	15,800	15,800	21,500	21,500	17,400	17,500	15,800	15,800	17,400	17,500	17,500	17,500
		South of Hand Avenue	14,800	14,800	14,800	14,700	14,700	14,800	14,800	16,300	16,600	16,500	18,900	16,000	14,800	16,200	16,200	16,100	16,200	16,100
		South of S.R. 40	21,400	21,400	21,500	21,300	21,300	21,400	21,400	22,800	23,400	23,300	24,300	22,600	21,300	22,800	22,700	22,700	22,700	22,600
Taylor Road (S.R. 421)		East of I-4 (S.R. 400)	700	800	700	700	700	700	700	700	700	700	700	700	0	0	0	0	0	0
		West of Tomoka Farms Road (S.R. 415)	2,200	2,200	2,200	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,000	2,000	2,000	1,900	2,000	1,900
		East of Tomoka Farms Road (S.R. 415)	13,600	14,100	13,900	14,300	15,800	14,900	14,000	14,100	13,900	14,000	13,900	13,900	13,800	14,200	13,800	15,600	13,900	14,800
		West of Williamson Boulevard (C.R. 4009)	33,900	34,100	33,700	34,000	37,600	36,500	33,900	33,900	33,800	33,800	33,800	33,800	33,600	33,900	33,800	37,500	33,800	36,300
		West of I-95 (S.R. 9)	65,400	66,000	65,400	65,900	68,600	67,500	65,900	65,900	65,800	65,900	65,800	65,800	65,300	65,900	65,800	68,800	65,900	67,700
		East of I-95 (S.R. 9)	92,100	91,600	92,700	91,700	92,400	91,900	91,600	91,600	91,700	92,100	92,200	91,700	92,600	91,600	92,300	93,000	92,500	92,700
S.R. 40		West of Stagecoach Road	42,000	42,000	41,800	42,100	42,100	42,000	41,900	41,900	42,400	42,300	40,300	40,300	41,900	41,900	40,300	40,300	40,300	40,400
		West of Tymber Creek Road	45,000	45,100,																

Appendix C

Bridge Construction Cost Estimates Worksheets

LPGA Blvd. Over I-4

	Qty	Unit	Unit Cost	Total Cost
Bridge	10923	SF	70	\$ 764,632.79
Approach Slab	2825	SF	16	\$ 45,199.97
Embankment	35650	CY	10	\$ 356,500.00
MSE Walls	3600	SF	25	\$ 90,000.00
Total				<u>\$ 1,256,332.76</u>

LPGA Blvd. Wild Life Crossing

	Qty	Unit	Unit Cost	Total Cost
Bridge	3767	SF	65	\$ 244,833.32
Approach Slab	2820	SF	16	\$ 45,120.00
Embankment	4815	CY	10	\$ 48,148.15
Sub-total				<u>\$ 338,101.46</u>
FENCING SPECIAL*	15840	LF	17	\$ 269,280.00
Total				<u>\$ 607,381.46</u>

* Taken from FDOT LPGA Blvd Extension LRE Analysis

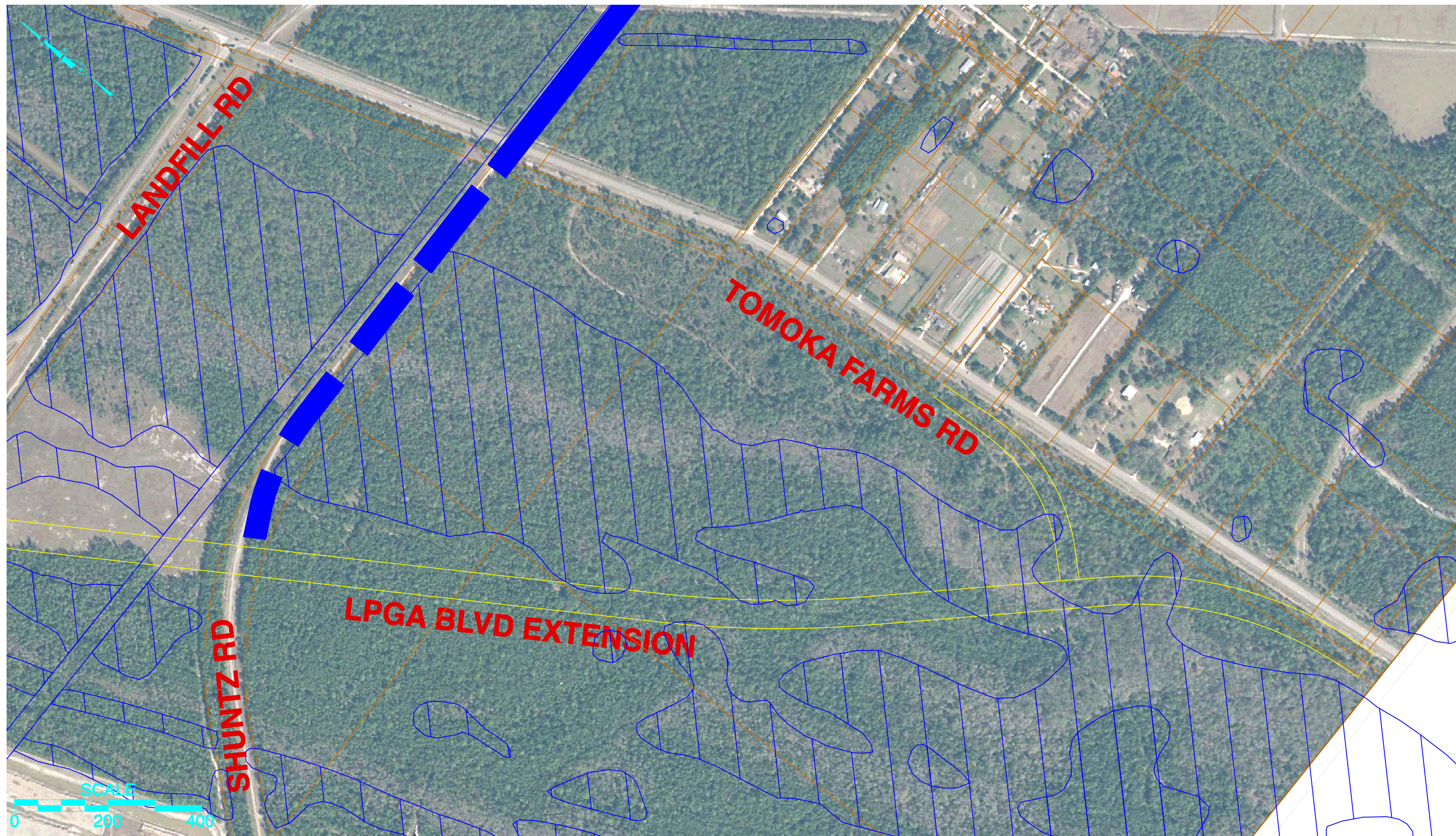
Appendix D

LPGA Boulevard Alignment Detail Sheets





LPGA EXTENSION ALIGNMENT
VOLUSIA COUNTY FLORIDA



LPGA EXTENSION ALIGNMENT
VOLUSIA COUNTY FLORIDA

Appendix E

FDOT Right-of-Way Estimate Worksheets

SPECIAL ESTIMATE

FLORIDA STATE DEPARTMENT OF TRANSPORTATION RIGHT OF WAY COST ESTIMATES					
FM# : 4102521		DISTRICT FIVE			
COUNTY : Volusia		FAP# :		DATE: 2-25-04	
ST. RD. : LPGA Blvd. Extension		TO Tomoka Farms RD			
FROM : SR 600 (US 92)					
NUMBER OF PARCELS	Business	3	Business	0	NUMBER OF RELOCATEES
	Residential	1	Residential	1	
	Unimproved	14	O.P. Signs	0	
			Special	0	
	Total	18	Total	1	
R/W SUPPORT COSTS (PHASE 41)					Amount
1. Direct Labor Cost		\$ 5,000 per Parcel			\$90,000
2. Indirect Overhead					\$0
3. Line 1 + 2			Total Phase 41		\$90,000
R/W ACQUISITION CONSULTANT (PHASE 42)					
4. Total Contract Estimate				(Leave Blank)	
				Total Phase 42	\$0
RELOCATION COSTS (PHASE 45)					
<u>Replacement Housing Costs</u>		<u>SFR</u>	<u>M.H.</u>	<u>APT.</u>	<u>Total Number</u>
5. Owner		0		1	0
6. Tenant		0			1
					\$8,000
<u>Move Costs</u>		<u>Total</u>	<u>Drs.</u>		
7. Residential		1			\$3,000
8. Business/ Farm		0	0		\$0
9. Personal Property/Non-categorized		0			\$0
					\$0
10. Total (Lines 5 thru 9)			Total Phase 45		\$11,000
11. Relocation Services Costs		\$0	(Not in Phase Total)		
R/W LAND COSTS (PHASE 43)					
12. Land, Improvements, & Severance Damages					\$983,000
13. Water Retention Area					\$954,000
14. Subtotal (Line 12 + 13)					\$1,937,000
15. Admin. Settlements					\$388,000
16. Litigation Awards					\$465,000
17. Business Damages					\$0
18. Owner Appraiser Fees		\$10,000 per Parcel			\$90,000
19. Owner CPA Fees					\$8,000
20. Defendant Attorney Fees					\$388,000
21. Other Condemnation Costs					\$78,000
22. Subtotal (Lines 15 thru 21)					\$1,417,000
23. Line 14 + Line 22		Total Phase 43			\$3,354,000
R/W OPS (PHASE 4B)					
24. Appraisal Fees					\$198,000
25. Business Damage CPA Fees					\$18,000
26. Court Reporter & Witness Fees					\$194,000
27. Demolition Contracts					\$0
28. Move Cost Estimate Fees					\$0
29. Attorney Fees (Outside Counsel)					\$36,000
30. Title Search					\$0
31. Hazardous Waste Investigations					\$5,000
32. Other					\$0
33. Total (Lines 24 thru 32)		Total Phase 4B			\$451,000
TOTAL ALL PHASES					\$3,906,000
(Leave Blank)					

Estimated by : Marchese & Johnson

Date: 2-25-04

Reviewed by :

Date:

Update # ____

0

REMARKS:

Double click in the box below and begin typing. Click outside the box to continue in EXCEL.
Alter the box by double clicking in it and make your changes.
You can resize the box by pointing to a square in the border and dragging.

This is a special estimate for Bill Walsh. Aerial photos and parcel sizes were provided and will be kept in our file.

This estimate was updated due to an increase in the size of Pond A from 4 acres to 17.6 acres.

Pond A will now cut into the adjacent property. The take area appears to be within an existing FP&L easement. No damages are expected.

This estimate assumes that the road *will not* be limited access.

According to the Project Manager, the weigh station at the landfill (parcel 10) is being moved by the County. A relocation cost was included for the doublewide being used as an office. This building is northwest of the weigh station.

Damage figures for the R/W parcels included the effects of the accompanying ponds for parcels 7, 11, and 14.

Recommendations would be to move ponds off the frontage to the rear if possible.

Yearly inflation factor is 5%. This estimate is rated E.

Reviewed by:

Project Manager ----- on -----

Department Head ----- on -----

CC: Bill Walsh

Records Management
Working File

THIS IS NOT AN APPRAISAL

This estimate is prepared solely for the internal use of the Florida Department of Transportation for budgeting and scheduling purposes. It is not intended to meet the requirements of the "Standards for Communication of Certified Appraisals" as contained in Florida Statutes, Section 475, Part 2.

FLORIDA STATE DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY COST ESTIMATES

Page 1 of 2

FM# :	4102521	DISTRICT FIVE
COUNTY :	Volusia	FAP# :
DATE:	2-25-04	
ST. RD. :	LPGA Blvd. Extension	
FROM :	SR 600 (US 92)	TO Tomoka Farms RD
NUMBER OF PARCELS	Business 3 Residential 1 Unimproved 14 Total 18	Business 0 Residential 1 O.P. Signs 0 Special 0 Total 1
		NUMBER OF RELOCATEES

R/W SUPPORT COSTS (PHASE 41)

Amount

1. Direct Labor Cost	\$ 5,000 per Parcel	\$90,000
2. Indirect Overhead		\$0
3. Line 1 + 2	Total Phase 41	\$90,000

R/W ACQUISITION CONSULTANT (PHASE 42)

(Leave Blank)

4. Total Contract Estimate	Total Phase 42	\$0
----------------------------	----------------	-----

RELOCATION COSTS (PHASE 45)

Replacement Housing Costs	SFR	M.H.	APT.	Total Number	
5. Owner	0		1	0	1
6. Tenant	0				
					\$8,000
Move Costs	Total		Drs.		
7. Residential	1				\$3,000
8. Business/ Farm	0		0		\$0
9. Personal Property/Non-categorized	0				\$0
					\$0
10. Total (Lines 5 thru 9)					Total Phase 45
					\$11,000
11. Relocation Services Costs	\$0				(Not in Phase Total)

R/W LAND COSTS (PHASE 43)

12. Land, Improvements, & Severance Damages		\$1,178,000
13. Water Retention Area		\$1,015,000
14. Subtotal (Line 12 + 13)		\$2,193,000
15. Admin. Settlements		\$439,000
16. Litigation Awards		\$527,000
17. Business Damages		\$0
18. Owner Appraiser Fees	\$10,000 per Parcel	\$90,000
19. Owner CPA Fees		\$8,000
20. Defendant Attorney Fees		\$439,000
21. Other Condemnation Costs		\$88,000
22. Subtotal (Lines 15 thru 21)		\$1,591,000
23. Line 14 + Line 22	Total Phase 43	\$3,784,000

R/W OPS (PHASE 4B)

24. Appraisal Fees		\$198,000
25. Business Damage CPA Fees		\$18,000
26. Court Reporter & Witness Fees		\$220,000
27. Demolition Contracts		\$0
28. Move Cost Estimate Fees		\$0
29. Attorney Fees (Outside Counsel)		\$36,000
30. Title Search		\$0
31. Hazardous Waste Investigations		\$5,000
32. Other		\$0
33. Total (Lines 24 thru 32)	Total Phase 4B	\$477,000

TOTAL ALL PHASES

\$4,362,000

SPECIAL ESTIMATE

FDOT Right of Way Cost Estimate

FM# 4102521

Page 2

Estimated by: Marchese & Johnson

Date: 2-25-04

Reviewed by:

Date:

Update # ____

0

REMARKS:

Double click in the box below and begin typing. Click outside the box to continue in EXCEL.
Alter the box by double clicking in it and make your changes.
 You can resize the box by pointing to a square in the border and dragging.

This is a special estimate for Bill Walsh. Aerial photos and parcel sizes were provided and will be kept in our file.

This estimate was updated due to an increase in the size of Pond A from 7.98 acres to 17.6 acres.

Pond A will now cut into the adjacent property. The take appears to be in an existing FP&L easement. No damages are expected.

This estimate assumes that the road *will not* be limited access.

According to the Project Manager, the weigh station at the landfill (parcel 10) is being moved by the County. A relocation cost was included for the doublewide being used as an office. This building is northwest of the weigh station.

Recommendations would be to move ponds off the frontage to the rear if possible.

Yearly inflation factor is 5%. This estimate is rated E.

Reviewed by:

Project Manager _____ on _____.

Department Head _____ on _____.

CC: Bill Walsh

Records Management
Working File

THIS IS NOT AN APPRAISAL

This estimate is prepared solely for the internal use of the Florida Department of Transportation for budgeting and

Appendix F

FDOT LRE Construction Cost Estimate Worksheets

Date: 1/14/2004 8:19:43 AM

FDOT Long Range Estimating System

R3: Project Details by Sequence Report

Project: 410252-1-52-01

Letting Date: 01/2020

Description: LPGA Blvd. extension from SR 600/US 92 to CR 415, Tomoka Farms Rd.

District: 05 County: 79 VOLUSIA

Market Area: 06 Units: English

Contract Class: 1 Lump Sum Project: N

Design/Build: N Project Length: 3.780 MI

Project Manager: Bill Walsh

Version 1-P Project Grand Total

\$11,697,237.25

Description: LPGA Blvd. extension from SR 600/US 92 to CR 415, Tomoka Farms Rd.

Sequence: 1 NUR - New Construction, Undivided, Rural

Net Length: 3.780 MI

Description: LPGA Blvd. extension from SR 600/US 92 to CR 415, Tomoka Farms Rd.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing L/R	50.00 / 50.00
Incidental Clearing and Grubbing Area	0.00

Alignment Number	1
Distance	3.725
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Alignment Number	2
Distance	0.114
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	126.00
Horizontal Elevation For Begin Section	105.00
Horizontal Elevation For End Section	105.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Alignment Number	3
Distance	0.114
Top of Structural Course For Begin Section	126.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	105.00
Horizontal Elevation For End Section	105.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Alignment Number	4
Distance	0.067
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	111.00

**Please Sign and Return
to Jonathan Linforth**

JSK REVIEWED

Date: 1/14/04

Project Mgr: Bill Walsh

☐ No Revisions Needed☐ Revisions Made☐ Marked for revisions

Reviewer's Signature: _____

Horizontal Elevation For Begin Section	105.00
Horizontal Elevation For End Section	105.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Alignment Number	5
Distance	0.067
Top of Structural Course For Begin Section	111.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	105.00
Horizontal Elevation For End Section	105.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	45.82	AC	\$6,000.00	\$274,920.00
120-1	EXCAVATION REGULAR	45,491.73	CY	\$5.00	\$227,458.65
120-6	EMBANKMENT	248,684.02	CY	\$5.00	\$1,243,420.10

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
120-4	EXCAVATION SUBSOIL	30,000.00	CY	\$6.00	\$180,000.00

Earthwork Component Total

\$1,925,798.75

ROADWAY COMPONENT**User Input Data**

Description	Value
Number of Lanes	2
Roadway Pavement Width L/R	12.00 / 12.00
Structural Spread Rate	250
Friction Course Spread Rate	160

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	STABILIZATION TYPE B	97,574.40	SY	\$1.80	\$175,633.92
285-709	BASE OPTIONAL (BASE GROUP 09)	54,686.02	SY	\$8.50	\$464,831.17
334-1-13	SUPERPAVE ASPH CONC (TRAFFIC C)	6,052.80	TN	\$54.00	\$359,251.20
337-7-6	ASPH CONC FC(INC BIT/RUB) FC12.5(FC-6)	4,257.79	TN	\$63.00	\$268,240.77

Pavement Marking Subcomponent

Description	Value
Solid Stripe No. of Stripes	2
Solid Stripe No. of Applications	2
Skip Stripe No. of Stripes	1
Skip Stripe No. of Applications	2
Top Layer Thermoplastic	N

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
----------	-------------	----------	------	------------	-----------------

706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	510.00 EA	\$3.50	\$1,785.00
710-21	TRAFFIC STRIPE SKIP (WHITE/BLACK)	7.56 GM	\$305.00	\$2,305.80
710-23-61	TRAFFIC STRIPE SOLID (WHITE/BLACK) (6")	15.12 NM	\$540.10	\$8,166.31

Peripherals Subcomponent

Description	Value
Off Road Bike Path(s)	0
Off Road Bike Path Width L/R	0.00 / 0.00
Bike Path Structural Spread Rate	0
Noise Barrier Wall Length	0.00
Noise Barrier Wall Begin Height	0.00
Noise Barrier Wall End Height	0.00

Pay Items

Pay Item	Description	Quantity Unit	Unit Price	Extended Amount
339-1	ASPHALT PAVEMENT MISCELLANEOUS	64.67 TN	\$118.63	\$7,671.80
536-1-1	GUARDRAIL (ROADWAY)	1,900.00 LF	\$13.98	\$26,562.00
536-85-22	GUARDRAIL END ANCH ASSEM FLARED	4.00 EA	\$1,500.00	\$6,000.00
Roadway Component Total				\$1,320,447.97

SHOULDER COMPONENT**User Input Data**

Description	Value
Total Outside Shoulder Width L/R	10.00 / 10.00
Total Outside Shoulder Sod Width L/R	2.67 / 2.67
Paved Outside Shoulder Width L/R	5.00 / 5.00
Structural Spread Rate	250
Friction Course Spread Rate	160
Total Width (T) / 8" Overlap (O)	T
Rumble Strips No. of Sides	0

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
285-704	BASE OPTIONAL (BASE GROUP 04)	23,639.62 SY	\$6.00	\$141,837.72
334-1-13	SUPERPAVE ASPH CONC (TRAFFIC C)	2,772.00 TN	\$54.00	\$149,688.00
337-7-6	ASPH CONC FC(INC BIT/RUB) FC12.5(FC-6)	1,774.08 TN	\$63.00	\$111,767.04
570-2	SEED & MULCH	10,334.02 SY	\$0.40	\$4,133.61
570-3	SEED GRASS (PERMANENT TYPE)	128.11 LB	\$2.21	\$283.12
570-4	MULCH MATERIAL	8.54 TN	\$83.18	\$710.36
575-1	SODDING	11,841.98 SY	\$1.50	\$17,762.97

Erosion Control**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-1	HAY OR STRAW BALE (18" X 18" X 36")	100.00 EA	\$6.10	\$610.00
104-13-1	SILT FENCE STAKED (TYPE III)	40,000.00 LF	\$1.40	\$56,000.00

Shoulder Component Total

\$482,792.82

DRAINAGE COMPONENT**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II (ENDWALLS)	68.04 CY	\$687.50	\$46,777.50
430-172-138	PIPE CULV(OPT MATL)(ROUND) (36"CD)	635.04 LF	\$130.00	\$82,555.20
430-174-129	PIPE CULV(OPT MATL)(ROUND) (24"SD)	3,024.00 LF	\$44.00	\$133,056.00
430-984-129	MITERED END SECT (OPTIONAL RD) (24" SD)	152.00 EA	\$700.00	\$106,400.00
575-1	SODDING	2,661.12 SY	\$1.50	\$3,991.68

Retention Basin 1

Description	Value
Size	10 AC
Multiplier	2
Depth	3.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	20.00 AC	\$6,000.00	\$120,000.00
120-1	EXCAVATION REGULAR	96,800.00 CY	\$4.00	\$387,200.00
400-2-2	CONC CLASS II (ENDWALLS)	72.00 CY	\$687.50	\$49,500.00
425-1-541	INLETS (DT BOT) (TYPE D) (<10')	4.00 EA	\$2,088.33	\$8,353.32
425-2-71	MANHOLES (J-7) (<10')	4.00 EA	\$3,525.00	\$14,100.00
430-171-140	PIPE CULV(OPT MATL)(ROUND) (42"SS)	200.00 LF	\$65.00	\$13,000.00
430-171-142	PIPE CULV(OPT MATL)(ROUND) (54"SS)	800.00 LF	\$113.00	\$90,400.00
550-2	FENCING TYPE B	5,560.00 LF	\$7.81	\$43,423.60
550-79-20	FENCE GATE (SLIDING) (CANTILEVER 20')	6.00 EA	\$1,250.00	\$7,500.00
575-1	SODDING	96,800.00 SY	\$1.50	\$145,200.00

Retention Basin 2

Description	Value
Size	5 AC
Multiplier	3
Depth	3.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	15.00 AC	\$6,000.00	\$90,000.00
120-1	EXCAVATION REGULAR	72,600.00 CY	\$4.00	\$290,400.00
400-2-2	CONC CLASS II (ENDWALLS)	90.00 CY	\$687.50	\$61,875.00
425-1-541	INLETS (DT BOT) (TYPE D) (<10')	3.00 EA	\$2,088.33	\$6,264.99
425-2-71	MANHOLES (J-7) (<10')	6.00 EA	\$3,525.00	\$21,150.00
430-171-140	PIPE CULV(OPT MATL)(ROUND) (42"SS)	150.00 LF	\$65.00	\$9,750.00
430-171-142	PIPE CULV(OPT MATL)(ROUND) (54"SS)	1,200.00 LF	\$113.00	\$135,600.00
550-2	FENCING TYPE B	5,580.00 LF	\$7.81	\$43,579.80

550-79-20	FENCE GATE (SLIDING) (CANTILEVER 20')	6.00 EA	\$1,250.00	\$7,500.00
575-1	SODDING	72,600.00 SY	\$1.50	\$108,900.00
Drainage Component Total				\$2,026,477.09

INTERSECTIONS COMPONENT

Intersection 1

Description	Value
Mainline No. of Left Turn Lanes	2
Mainline No. of Right Turn Lanes	2
Mainline Design Speed	45
Cross Street Thru Lanes	2
Cross Street No. of Left Turn Lanes	2
Cross Street No. of Right Turn Lanes	2
Cross Street Design Speed	45
T-Intersection?	N
Multiplier	2
Description	Intersections at Shunz Rd. and at the landfill.

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
120-6	EMBANKMENT	19,022.74 CY	\$5.00	\$95,113.70
160-4	STABILIZATION TYPE B	4,506.66 SY	\$1.80	\$8,111.99
160-4	STABILIZATION TYPE B	10,022.88 SY	\$1.80	\$18,041.18
285-704	BASE OPTIONAL (BASE GROUP 04)	1,213.34 SY	\$6.00	\$7,280.04
285-709	BASE OPTIONAL (BASE GROUP 09)	4,506.66 SY	\$8.50	\$38,306.61
285-709	BASE OPTIONAL (BASE GROUP 09)	8,809.54 SY	\$8.50	\$74,881.09
334-1-13	SUPERPAVE ASPH CONC (TRAFFIC C)	563.34 TN	\$54.00	\$30,420.36
334-1-13	SUPERPAVE ASPH CONC (TRAFFIC C)	1,161.86 TN	\$54.00	\$62,740.44
337-7-6	ASPH CONC FC(INC BIT/RUB) FC12.5(FC-6)	360.54 TN	\$63.00	\$22,714.02
337-7-6	ASPH CONC FC(INC BIT/RUB) FC12.5(FC-6)	801.82 TN	\$63.00	\$50,514.66
575-1	SODDING	647.92 SY	\$1.50	\$971.88

Intersection 2

Description	Value
Mainline No. of Left Turn Lanes	1
Mainline No. of Right Turn Lanes	1
Mainline Design Speed	45
Cross Street Thru Lanes	4
Cross Street No. of Left Turn Lanes	1
Cross Street No. of Right Turn Lanes	1
Cross Street Design Speed	60
T-Intersection?	Y
Multiplier	2
Description	Intersections at SR 600 & CR 415

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
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120-6	EMBANKMENT	21,335.36 CY	\$5.00	\$106,676.80
160-4	STABILIZATION TYPE B	2,653.34 SY	\$1.80	\$4,776.01
160-4	STABILIZATION TYPE B	11,654.10 SY	\$1.80	\$20,977.38
285-704	BASE OPTIONAL (BASE GROUP 04)	1,206.66 SY	\$6.00	\$7,239.96
285-709	BASE OPTIONAL (BASE GROUP 09)	2,653.34 SY	\$8.50	\$22,553.39
285-709	BASE OPTIONAL (BASE GROUP 09)	10,447.44 SY	\$8.50	\$88,803.24
334-1-13	SUPERPAVE ASPH CONC (TRAFFIC C)	331.66 TN	\$54.00	\$17,909.64
334-1-13	SUPERPAVE ASPH CONC (TRAFFIC C)	1,366.26 TN	\$54.00	\$73,778.04
337-7-6	ASPH CONC FC(INC BIT/RUB) FC12.5(FC-6)	212.26 TN	\$63.00	\$13,372.38
337-7-6	ASPH CONC FC(INC BIT/RUB) FC12.5(FC-6)	932.34 TN	\$63.00	\$58,737.42
575-1	SODDING	644.36 SY	\$1.50	\$966.54
Intersections Component Total				\$824,886.80

SIGNING COMPONENT

Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
700-40-1	SIGN SINGLE POST (LESS THAN 12)	8.00 AS	\$222.63	\$1,781.04
700-40-2	SIGN SINGLE POST (12 - 25)	76.00 AS	\$547.55	\$41,613.80
700-41-10	SIGN MULTI POST (50 OR LESS)	8.00 AS	\$2,334.00	\$18,672.00
700-83	SIGN OVHD (BRIDGE MOUNTED)	8.00 AS	\$4,765.75	\$38,126.00
Signing Component Total				\$100,192.84

SIGNALIZATIONS COMPONENT

Signalization 1

Description	Value
Type	2 Lane Strain Pole
Multiplier	3

Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-1-12	CONDUIT (F&I) (UNDERGROUND)	2,400.00 LF	\$3.88	\$9,312.00
630-1-14	CONDUIT (F&I) (UG - JACKED)	450.00 LF	\$14.07	\$6,331.50
632-7-1	CABLE (SIGNAL) (F&I)	3.00 PI	\$2,197.57	\$6,592.71
634-4-113	SPAN WIRE ASSEMBLY (F&I)(2 WIRE) (BOX)	3.00 PI	\$1,225.00	\$3,675.00
635-1-11	PULL & JUNC BOX (F&I) (PULL BOX)	30.00 EA	\$221.38	\$6,641.40
639-1-12	ELECTRIC POWER SVC (OVERHEAD)	3.00 AS	\$630.00	\$1,890.00
639-2-1	ELECTRICAL SERVICE WIRE	90.00 LF	\$1.93	\$173.70
641-15-142	PREST CONC POLE (F&I)(42' TYPE N-VI)	12.00 EA	\$2,500.00	\$30,000.00
650-51-311	SIGNAL TRAFFIC(F&I)(3 SECT 1 WAY)(STD)	30.00 AS	\$616.67	\$18,500.10
653-111	SIGNAL PEDESTRIAN (12"	24.00 AS	\$459.00	\$11,016.00

	INCANDESCENT)			
659-101	SIGNAL HEAD AUX (BACK PLT 3 SECT)	18.00 EA	\$100.00	\$1,800.00
660-1-102	LOOP DETECT INDUC (TYPE 2) (F&I)	30.00 EA	\$137.00	\$4,110.00
660-2-106	LOOP ASSEMBLY (F&I) (TYPE F)	30.00 AS	\$690.56	\$20,716.80
665-11	DET PED(F&I)(DET STA POLE OR CAB MTD)	24.00 EA	\$102.60	\$2,462.40
670-5-111	CNTL ASSEM ACT SS F&I NEMA PRE(ONE)	3.00 AS	\$11,064.00	\$33,192.00
700-48-19	SIGN PANEL (F & I) (16 - 100)	12.00 EA	\$418.12	\$5,017.44
Signalizations Component Total				\$161,431.05

BRIDGES COMPONENT**Bridge 79000A**

Description	Value
Length	240.00
Width	48.00
Type	Overpass Bridge
Substructure Type	Pile Bents
Superstructure Type	AASHTO Girder
Cost Factor	1.00
Removal of existing structures area	0.00
Default Cost per SF	\$70.00
Factored Cost per SF	\$70.00
Final Cost per SF	\$74.11

Pay Items

Pay Item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II (APPROACH SLABS)	106.67	CY	\$400.00	\$42,668.00
415-1-9	REINF STEEL (APPROACH SLABS)	9,280.29	LB	\$0.50	\$4,640.15
Bridge 79000A Total					\$853,708.15

Bridge 79000B

Description	Value
Length	50.00
Width	48.00
Type	Overpass Bridge
Substructure Type	Pile Bents
Superstructure Type	AASHTO Girder
Cost Factor	1.00
Removal of existing structures area	0.00
Default Cost per SF	\$70.00
Factored Cost per SF	\$70.00
Final Cost per SF	\$201.91

Pay Items

Pay Item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II (APPROACH SLABS)	106.67	CY	\$400.00	\$42,668.00
415-1-9	REINF STEEL (APPROACH SLABS)	9,280.29	LB	\$0.50	\$4,640.15

EX-Items

Pay Item	Description	Quantity	Unit	Unit Price	Extended Amount
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550-73	FENCING SPECIAL	15,840.00 LF	\$17.00	\$269,280.00
	Bridge 79000B Total			\$484,588.15
	Bridges Component Total			\$1,338,296.30
<hr/>				
	Sequence 1 Total			\$8,180,323.62
<hr/>				

Sequence: 2 NUR - New Construction, Undivided, Rural
Description: Ramp at CR 415

Net Length: 0.265 MI

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing L/R	50.00 / 50.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.265
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	3.21 AC	\$6,000.00	\$19,260.00
120-6	EMBANKMENT	8,342.86 CY	\$5.00	\$41,714.30
Earthwork Component Total				\$60,974.30

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	1
Roadway Pavement Width L/R	22.00 / 0.00
Structural Spread Rate	250
Friction Course Spread Rate	160

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	STABILIZATION TYPE B	5,285.87 SY	\$1.80	\$9,514.57
285-709	BASE OPTIONAL (BASE GROUP 09)	3,471.57 SY	\$8.50	\$29,508.34
334-1-13	SUPERPAVE ASPH CONC (TRAFFIC C)	427.53 TN	\$54.00	\$23,086.62
337-7-6	ASPH CONC FC(INC BIT/RUB) FC12.5(FC-6)	273.62 TN	\$63.00	\$17,238.06

Pavement Marking Subcomponent

Description	Value
Solid Stripe No. of Stripes	2
Solid Stripe No. of Applications	2
Skip Stripe No. of Stripes	0
Skip Stripe No. of Applications	2
Top Layer Thermoplastic	N

Pay Items

Pay item	Description	Quantity Unit	Unit	Extended Amount
----------	-------------	---------------	------	-----------------

710-23-61	TRAFFIC STRIPE SOLID (WHITE/BLACK) (6")	1.06 NM	Price \$540.10	\$572.51
Roadway Component Total				\$79,920.10

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	6.00 / 6.00
Total Outside Shoulder Sod Width L/R	2.67 / 2.67
Paved Outside Shoulder Width L/R	0.00 / 0.00
Structural Spread Rate	100
Friction Course Spread Rate	160
Total Width (T) / 8" Overlap (O)	T
Rumble Strips No. of Sides	0

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
570-2	SEED & MULCH	1,035.41 SY	\$0.40	\$414.16
570-3	SEED GRASS (PERMANENT TYPE)	12.84 LB	\$2.21	\$28.38
570-4	MULCH MATERIAL	0.86 TN	\$83.18	\$71.53
575-1	SODDING	830.19 SY	\$1.50	\$1,245.29
Shoulder Component Total				\$1,759.36

Sequence 2 Total	\$142,653.76
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Date: 1/14/2004 8:19:43 AM

FDOT Long Range Estimating System

R3: Project Details by Sequence Report

Project: 410252-1-52-01

Letting Date: 01/2020

Description: LPGA Blvd. extension from SR 600/US 92 to CR 415, Tomoka Farms Rd.

District: 05 County: 79 VOLUSIA

Market Area: 06 Units: English

Contract Class: 1 Lump Sum Project: N

Design/Build: N Project Length: 3.780 MI

Project Manager: Bill Walsh

Version 1-P Project Grand Total

\$11,697,237.25

Description: LPGA Blvd. extension from SR 600/US 92 to CR 415, Tomoka Farms Rd.

Project Sequences Subtotal	\$8,322,977.38
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102-1	Maintenance of Traffic	10.00 %	\$832,297.74
101-1	Mobilization	10.00 %	\$915,527.51

Project Sequences Total	\$10,070,802.63
--------------------------------	------------------------

Scope Creep	15.00 %	\$1,510,620.39
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Non-Bid Components:

Pay Item	Description	Quantity	Unit	Unit Price	Extended Amount
999-25	INITIAL CONTINGENCY (DO NOT BID)		LS	\$115,814.23	\$115,814.23

Project Non-Bid Subtotal	\$115,814.23
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Version 1-P Project Grand Total	\$11,697,237.25
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Appendix G

Florida Natural Areas Inventory

Appendix F.

Volusia County occurrences and status of species of concern for the state of Florida. Data table and associated information was downloaded from the Florida Natural Areas Inventory website <http://www.fnai.org/VOLU-SUM.HTM>.

County Occurrence Status

Vertebrates and Invertebrates:

C = (Confirmed) Occurrence status derived from a documented record in the FNAI data base.

P = (Potential) Occurrence status derived from a reported occurrence for the county or the occurrence lies within the published range of the taxon.

N = (Nesting) For sea turtles only; occurrence status derived from documented nesting occurrences.

Plants, Natural Communities, and Other:

C = (Confirmed) Occurrence status derived from a documented record in the FNAI data base or from a herbarium specimen.

R = (Reported) Occurrence status derived from published reports.

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Florida Natural Area Inventory Listing of rare species found or believed to be present in Volusia County

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Occurrence Status
<u>FISH</u>						
<i>Acipenser brevirostrum</i>	shortnose sturgeon	G3	S1	LE	LE	C
<i>Agonostomus monticola</i>	mountain mullet	G5	S3	N	N	C
<i>Ameiurus brunneus</i>	snail bullhead	G4	S3	N	N	C
<i>Petromyzon marinus</i>	sea lamprey	G5	SA	N	N	P
<i>Pteronotopis welaka</i>	bluenose shiner	G4	S4	N	LS	C
<u>AMPHIBIANS</u>						
<i>Notophthalmus perstriatus</i>	striped newt	G2G3	S2S3	N	N	P
<i>Rana capito</i>	gopher frog	G4	S3	N	LS	P

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<i>Falco peregrinus</i>	peregrine falcon	G4	S2	LE	LE	P
<i>Falco sparverius paulus</i>	southeastern American kestrel	G5T3T4	S3?	N	LT	C
<i>Grus canadensis pratensis</i>	Florida sandhill crane	G5T2T3	S2S3	N	LT	C
<i>Haematopus palliatus</i>	American oystercatcher	G5	S3	N	LS	P
<i>Haliaeetus leucocephalus</i>	bald eagle	G4	S3	LT	LT	C
<i>Ixobrychus exilis</i>	least bittern	G5	S4	N	N	P
<i>Laterallus jamaicensis</i>	black rail	G4	S3?	N	N	C
<i>Mycteria americana</i>	wood stork	G4	S2	LE	LE	C
<i>Nyctanassa violacea</i>	yellow-crowned night-heron	G5	S3?	N	N	P
<i>Nycticorax nycticorax</i>	black-crowned night-heron	G5	S3?	N	N	C
<i>Pandion haliaetus</i>	osprey	G5	S3S4	N	LS**	C
<i>Pelecanus occidentalis</i>	brown pelican	G4	S3	N	LS	C
<i>Picoides borealis</i>	red-cockaded woodpecker	G3	S2	LE	LT	C
<i>Picoides villosus</i>	hairy woodpecker	G5	S3?	N	N	P
<i>Plegadis falcinellus</i>	glossy ibis	G5	S2	N	N	P
<i>Rynchops niger</i>	black skimmer	G5	S3	N	LS	P
<i>Sterna antillarum</i>	least tern	G4	S3	N	LT	C
<i>Sterna caspia</i>	Caspian tern	G5	S2?	N	N	P
<i>Sterna maxima</i>	royal tern	G5	S3	N	N	P
<i>Sterna sandvicensis</i>	sandwich tern	G5	S2	N	N	P
<i>Vireo altiloquus</i>	black-whiskered vireo	G5	S3	N	N	P
<u>MAMMALS</u>						
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	G3	S3?	N	N	P
<i>Eubalaena glacialis</i>	black right whale	G1	S1	LE	LE	C
<i>Mustela frenata olivacea</i>	southeastern weasel	G5T4	S3?	N	N	P
<i>Mustela frenata peninsulæ</i>	Florida long-tailed weasel	G5T3	S3?	N	N	C
<i>Neofiber alleni</i>	round-tailed muskrat	G3	S3	N	N	P
<i>Peromyscus polionotus niveiventris</i>	southeastern beach mouse	G5T1	S1	LT	LT	P
<i>Podomys floridanus</i>	Florida mouse	G3	S3	N	LS	P

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<u>REPTILES</u>						
<i>Alligator mississippiensis</i>	American alligator	G5	S4	T(S/A)	LS	C
<i>Caretta caretta</i>	loggerhead	G3	S3	LT	LT	C
<i>Chelonia mydas</i>	green turtle	G3	S2	LE	LE	C
<i>Clemmys guttata</i>	spotted turtle	G5	S3?	N	N	P
<i>Crotalus adamanteus</i>	eastern diamondback rattlesnake	G5	S3	N	N	C
<i>Dermochelys coriacea</i>	leatherback	G3	S2	LE	LE	C
<i>Drymarchon corais couperi</i>	eastern indigo snake	G4T3	S3	LT	LT	C
<i>Gopherus polyphemus</i>	gopher tortoise	G3	S3	N	LS	C
<i>Lepidochelys kempii</i>	Kemp's ridley	G1	S1	LE	LE	P
<i>Nerodia clarkii taeniata</i>	Atlantic salt marsh snake	G4T1	S1	LT	LT	C
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake	G5T3?	S3	N	LS	C
<u>BIRDS</u>						
<i>Accipiter cooperii</i>	Cooper's hawk	G4	S3?	N	N	P
<i>Aimophila aestivalis</i>	Bachman's sparrow	G3	S3	N	N	P
<i>Ajaia ajaja</i>	roseate spoonbill	G5	S2S3	N	LS	P
<i>Aphelocoma coerulescens</i>	Florida scrub-jay	G3	S3	LT	LT	C
<i>Aramus guarauna</i>	limpkin	G5	S3	N	LS	C
<i>Ardea alba</i>	great egret	G5	S4	N	N	C
<i>Buteo brachyurus</i>	short-tailed hawk	G4?	S3	N	N	P
<i>Caracara plancus</i>	crested caracara	G5	S2	LT	LT	P
<i>Charadrius melodus</i>	piping plover	G3	S2	LT	LT	C
<i>Dendroica discolor paludicola</i>	Florida prairie warbler	G5T3	S3	N	N	P
<i>Egretta caerulea</i>	little blue heron	G5	S4	N	LS	C
<i>Egretta rufescens</i>	reddish egret	G4	S2	N	LS	C
<i>Egretta thula</i>	snowy egret	G5	S4	N	LS	C
<i>Egretta tricolor</i>	tricolored heron	G5	S4	N	LS	C
<i>Elanoides forficatus</i>	swallow-tailed kite	G4	S2S3	N	N	P
<i>Eudocimus albus</i>	white ibis	G5	S4	N	LS	C
<i>Falco columbarius</i>	merlin	G5	SU	N	N	P

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<i>Sciurus niger shermani</i>	Sherman's fox squirrel	G5T2	S2	N	LS	P
<i>Sorex longirostris longirostris</i>	southeastern shrew	G5T5	S4	N	N	P
<i>Trichechus manatus</i>	manatee	G2?	S2?	LE	LE	C
<i>Ursus americanus floridanus</i>	Florida black bear	G5T2	S2	C	LT**	C
<u>INVERTEBRATES</u>						
<i>Aphaestracon asthenes</i>	Blue Spring hydrobe	G1	S1	N	N	C
<i>Cincinnatia monroensis</i>	Enterprise siltsnail	G1	S1	N	N	C
<i>Cincinnatia parva</i>	Blue Spring siltsnail	G1	S1	N	N	C
<u>VASCULAR PLANTS</u>						
<i>Acrostichum aureum</i>	golden leather fern	G5	S3	N	LE	C
<i>Adiantum tenerum</i>	brittle maidenhair fern	G5	S3	N	LE	R
<i>Amyris balsamifera</i>	balsam torchwood	G4	SX	N	N	C
<i>Aristida rhizomophora</i>	Florida three-awned grass	G2	S2	N	N	C
<i>Asclepias curtissii</i>	Curtiss' milkweed	G3	S3	N	LE	C
<i>Asplenium auritum</i>	auricled spleenwort	G5	S2	N	LE	C
<i>Asplenium serratum</i>	bird's nest spleenwort	G4G5	S1	N	LE	C
<i>Calamintha ashei</i>	Ashe's savory	G3	S3	N	LT	C
<i>Centrosema arenicola</i>	sand butterfly pea	G2	S2	N	N	C
<i>Chamaesyce cumulicola</i>	sand-dune spurge	G2	S2	N	LE	C
<i>Cheiroglossa palmata</i>	hand fern	G4	S2	N	LE	C
<i>Coelorachis tuberculosa</i>	piedmont jointgrass	G3	S3	N	N	R
<i>Conradina grandiflora</i>	large-flowered rosemary	G3	S3	N	LE	C
<i>Cucurbita okeechobeensis</i> ssp <i>okeechobeensis</i>	Okeechobee gourd	G1T1	S1	LE	LE	C
<i>Deeringothamnus rugelii</i>	Rugel's pawpaw	G1	S1	LE	LE	C
<i>Glandularia maritima</i>	coastal vervain	G3	S3	N	LE	C
<i>Glandularia tampensis</i>	Tampa vervain	G1	S1	N	LE	C
<i>Harrisia simpsonii</i>	Simpson's prickly apple	G2Q	S2	N	LE	C
<i>Hartwrightia floridana</i>	hartwrightia	G2	S2	N	LT	C
<i>Helianthus carnosus</i>	lake-side sunflower	G1G2	S1S2	N	LE	C
<i>Ilex opaca</i> var <i>arenicola</i>	scrub holly	G5T3	S3	N	N	C

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<i>Illicium parviflorum</i>	star anise	G1G2	S1	N	LE	C
<i>Lantana depressa</i> var <i>floridana</i>	Atlantic Coast Florida lantana	G2T2	S2	N	LE	C
<i>Lechea cernua</i>	nodding pinweed	G3	S3	N	LT	C
<i>Lechea divaricata</i>	pine pinweed	G2	S2	N	LE	C
<i>Matelea floridana</i>	Florida spiny-pod	G2	S2	N	LE	R
<i>Minuartia godfreyi</i>	Godfrey's sandwort	G1	S1	N	N	R
<i>Monotropis reynoldsiae</i>	pigmy pipes	G1Q	S1	N	LE	C
<i>Myriophyllum laxum</i>	piedmont water-milfoil	G3	S2S3	N	N	R
<i>Nemastylis floridana</i>	fall-flowering ixia	G2	S2	N	LE	C
<i>Nolina atopocarpa</i>	Florida beargrass	G3	S3	N	LT	C
<i>Pavonia spinifex</i>	yellow hibiscus	G4G5	S2S3	N	N	C
<i>Peperomia humilis</i>	terrestrial peperomia	G5	S2	N	LE	C
<i>Persea humilis</i>	scrub bay	G3	S3	N	N	C
<i>Physostegia leptophylla</i>	slender-leaved dragon- head	G4?	S3S4	N	N	C
<i>Rhynchospora decurrens</i>	decurrent beakrush	G3G4	S2	N	N	C
<i>Schwalbea americana</i>	chaffseed	G2	S1	LE	LE	C
<i>Verbesina heterophylla</i>	variable-leaf crownbeard	G2	S2	N	N	C
<i>Zephyranthes simpsonii</i>	rain lily	G2G3	S2S3	N	LT	C
<u>NATURAL COMMUNITIES</u>						
Basin Marsh		G?	S4?	N	N	C
Basin Swamp		G4?	S3	N	N	C
Baygall		G4?	S4?	N	N	C
Beach Dune		G4?	S2	N	N	C
Blackwater Stream		G4	S2	N	N	C
Bog		G?	S3	N	N	C
Coastal Grassland		G3	S2	N	N	C
Coastal Strand		G3?	S2	N	N	C
Depression Marsh		G4?	S3	N	N	C
Estuarine Tidal Marsh		G4	S4	N	N	C

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Floodplain Marsh		G3?	S2	N	N	C
Floodplain Swamp		G?	S4?	N	N	C
Hydric Hammock		G?	S4?	N	N	C
Maritime Hammock		G4	S2	N	N	C
Mesic Flatwoods		G?	S4	N	N	C
Sandhill Upland Lake		G3	S2	N	N	C
Sandhill		G2G3	S2	N	N	C
Scrubby Flatwoods		G3	S3	N	N	C
Scrub		G2	S2	N	N	C
Shell Mound		G3	S2	N	N	C
Slope Forest		G3	S2	N	N	C
Spring-run Stream		G2	S2	N	N	C
Upland Mixed Forest		G?	S4	N	N	C
Wet Flatwoods		G?	S4?	N	N	C
Xeric Hammock		G?	S3	N	N	C
<u>OTHER</u>						
Bird rookery				N	N	C
Geological feature				N	N	C
Manatee aggregation site				N	N	C