

# ***PRELIMINARY ENGINEERING REPORT***

## **COBB ROAD (CR 485) / US 98 PD&E STUDY**

From SR 50 to Suncoast Parkway in Hernando County, Florida

WPI Nos. 257299 1 & 405017 1; FAP Nos: 2891 007 P & 2891 008 P



***Florida Department of Transportation***  
***District Seven***

**June 2003**

# **PRELIMINARY ENGINEERING REPORT**

**Cobb Road (CR 485) / US 98  
Project Development and Environment Study**

**Cobb Road (CR 485), from SR 50 to US 98  
and  
US 98, from Cobb Road to Suncoast Parkway  
Hernando County, Florida**

**WPI Segment Nos.: 257299 1 & 405017 1  
FAP Nos.: 2891 007 P & 2891 008 P**

**This proposed action consists of capacity and safety improvements to  
Cobb Road (CR 485), a two-lane undivided arterial,  
from SR 50 to US 98 and US 98, a two-lane undivided arterial,  
from Cobb Road to North Suncoast Parkway**

**FLORIDA DEPARTMENT OF TRANSPORTATION  
District Seven**

**June 2003**

## PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I am a registered professional engineer in the State of Florida practicing with H.W. Lochner, Inc., 13577 Feather Sound Drive, Suite 600, Clearwater, Florida 33762, a corporation authorized to operate as an engineering business, EB 0000894, by the State of Florida Department of Professional Regulation, Board of Professional Engineers, and that I have prepared or approved the evaluation, findings, opinions, conclusions, or technical advice hereby reported for:

PROJECT: Cobb Road / US 98 PD&E Study  
FINANCIAL ID NUMBER: 2891 007 P & 2891 008 P  
LOCATION: Hernando County, Florida  
CLIENT: Florida DOT – District Seven

This Preliminary Engineering Report includes a summary of data collection efforts and analyses, leading to development and evaluation of alternative alignments and typical cross sections for the improvement of Cobb Road and US 98 in Hernando County, Florida.

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## **1.0 SUMMARY**

The Florida Department of Transportation (FDOT) is proposing capacity improvements to the existing two-lane undivided arterials, Cobb Road (CR 485) and US 98. The project study area extends on Cobb Road from SR 50 in the City of Brooksville northward to US 98 and on US 98 from Cobb Road to the Suncoast Parkway in Hernando County, Florida.

The need for this project was identified by Hernando County and the City of Brooksville, and is based upon projected increases in traffic volumes and on the deficiencies in the existing transportation system. In addition to the capacity improvements, the project is expected to provide a safer enhanced route for truck traffic to use in bypassing downtown Brooksville, which is a need outlined in the Hernando County Metropolitan Planning Organization (MPO) *2025 Long Range Transportation Plan (LRTP<sup>1</sup>)*.

This report is one component of a Project Development and Environment Study, which examines in detail the proposed widening of Cobb Road and a portion of US 98. This *Preliminary Engineering Report (PER)* provides background information pursuant to the Florida Department of Transportation *Project Development and Environment Manual*, including a comparative evaluation between alternative design concepts that have been developed for the purpose of selecting the recommended alternative.

### **1.1 RECOMMENDATIONS**

For this PD&E Study, the project was divided into segments for analysis. The segments of Cobb Road were chosen based on surrounding characteristics such as land use and environmental constraints, as well as the potential need for realignments. The segments of US 98 were chosen to match FDOT resurfacing project limits for consistency. The segments of the project are identified as follows:

- **Segment 1a:** Cobb Road from north of SR 50 to north of the Brooksville Water Reclamation Facility (WRF) driveway
- **Segment 1b:** Cobb Road from north of the Brooksville WRF driveway to north of Yontz Road
- **Segment 2a:** Cobb Road from north of Yontz Road to south of US 98
- **Segment 2b:** Cobb Road/US 98 Intersection
- **Segment 3:** US 98 from north of Cobb Road to CR 491
- **Segment 4:** US 98 from CR 491 to Suncoast Parkway

### 1.1.1 Proposed Typical Sections

#### 1.1.1.1 Segment 1a

The limits of Segment 1a are along Cobb Road (CR 485) from north of SR 50 to north of the Brooksville WRF driveway. The existing Cobb Road roadway from SR 50 to Shadyside Drive was previously upgraded to a four-lane urban facility in conjunction with the SR 50 improvement project from Colorado Street to Cobb Road. The existing roadway from Shadyside Drive to north of the Brooksville WRF driveway is a two-lane facility, centered within a right-of-way width which varies from 100 ft. to 140 ft.

The proposed urban typical section (**Exhibit 8.2**) for Segment 1a along Cobb Road is a four-lane divided urban roadway with a 17.5-ft. median. This typical section consists of two 12-ft. travel lanes in each direction, a 6-ft. sidewalk on the left side and a 12-ft. shared use path on the right side. The proposed minimum right-of-way width is 100 ft. The proposed design speed is 45 mph.

#### 1.1.1.2 Segment 1b

The limits of Segment 1b are along Cobb Road from north of the Brooksville WRF driveway to north of Yontz Road. The existing roadway is a two-lane facility, centered within 120 ft. of right-of-way.

The proposed suburban typical section (**Exhibit 8.3**) for Segment 1b along Cobb Road is a four-lane divided suburban roadway with a 30-ft. median (22-ft. curb to curb and 4-ft. offsets to edge of inside travel lanes). This typical section consists of two 12-ft. travel lanes in each direction with 8-ft. outside shoulders (5 ft. paved) and a 12-ft. shared use path on the right side. Roadside drainage is handled in shallow swales with ditch bottom inlets. The proposed minimum right-of-way width is 158 ft., and the proposed design speed is 55 mph. This suburban typical section would accommodate a future six-lane roadway by milling, resurfacing, outside widening and re-striping the existing pavement. The new fifth and sixth travel lanes could be added adjacent to the outside edge of pavement along with a curb and gutter drainage system.

#### 1.1.1.3 Segment 2a

The limits of Segment 2a are on Cobb Road from north of Yontz Road to south of US 98. The existing two-lane roadway is centered within the existing right-of-way, which varies from 120 to 150 ft. in width.

The proposed suburban typical section (**Exhibit 8.3**), as described above in **Section 1.1.1.2**, will be used for Segment 2a along Cobb Road from north of Yontz Road to Youth Drive.

The proposed rural typical section (**Exhibit 8.5**) for Segment 2a along Cobb Road from Youth Drive to south of US 98 is a four lane rural roadway with a 46-ft. median. This typical section consists of two 12-ft. lanes, 8-ft. outside shoulders (5-ft. paved) and 6-ft. inside shoulders (4-ft. paved) in each direction and a 12-ft. shared use path on the right (east) side. The minimum proposed right-of-way width required is 240 ft. The minimum proposed border width for this typical section is 40 ft.; however, a border width of 61 ft. is being proposed. The proposed wider than minimum border width matches the typical section that was developed for the project (SPN 02100-1505, WPI No. 7119013) along US 98 from the Suncoast Parkway to US 19. This wider typical section was developed during a re-evaluation for that project once it was determined that the rolling terrain along

this section of US 98 required a wider border width to connect to existing ground elevations. The design speed for this roadway is 70 mph.

#### 1.1.1.4 Segment 2b

The limits of Segment 2b are within 2000 ft. of each leg of the Cobb Road/US 98 'T'-intersection. The existing Cobb Road intersects US 98 at a 90° angle; however, one characteristic of the improvements associated with this project is the designation of Cobb Road as US 98 to bypass the City of Brooksville. Therefore, a new intersection alignment was evaluated to direct through traffic onto Cobb Road from northern US 98.

The proposed rural typical section (**Exhibit 8.5**), as described above in **Section 1.1.1.3**, will be used for Segment 2b along the new alignment of the Cobb Road / US 98 intersection.

#### 1.1.1.5 Segments 3 and 4

The limits of Segment 3 are on US 98 from north of Cobb Road to CR 491. The limits of Segment 4 are on US 98 from CR 491 to south of the Suncoast Parkway. The centerline of the existing two-lane roadway for both segments is offset 32 ft. south of the center of the existing 200 ft. of right-of-way. The existing centerline of construction is 68 ft. from the south right-of-way line (see **Exhibit 4.3**). US 98 was divided into two segments (Segments 3 and 4) in order to be consistent with the limits of FDOT resurfacing projects, which were approaching construction at the time this report was under preparation.

The proposed rural typical section (**Exhibit 8.5**), as described above in **Section 1.1.1.3**, will be used for Segments 3 and 4 along US 98.

### **1.1.2 Recommended Alternative**

The Recommended Alternative for this PD&E Study is a four-lane divided facility consisting of the following typical sections and alignments. From SR 50 to the Brooksville WRF driveway, an urban typical section will be utilized. This typical section is designed to generally fit within the existing right-of-way with the exception of a small clip from the northwest quadrant of the Shadyside Drive intersection. North of the Brooksville WRF driveway, the proposed roadway transitions to a suburban typical section with a left alignment. North of Youth Drive, the proposed roadway transitions to a rural typical section with a left alignment. A realignment (rural typical section) is proposed in the southwest quadrant of the existing Cobb Road / US 98 intersection, which will provide a through movement between existing Cobb Road (future US 98 designation) and existing US 98 to the north. A rural typical section with a left alignment is proposed for the remainder of the project limits along US 98.

The estimated cost of the Recommended Alternative roadway improvements (including stormwater ponds) are summarized in **Table 1.1**.

## **1.2 COMMITMENTS**

The following commitments were made during the PD&E Study process in order to minimize impacts of this project on the environment and local residents and business owners. These commitments will optimize the effectiveness of the proposed improvements.

1. The FDOT is committed to further coordination during the design phase with the CSX Railroad concerning the railroad switch relocation and trail crossing at the railroad crossing near Yontz Road.
2. The FDOT is committed to further evaluation during the design phase of issues concerning access management at the Fort Dade Avenue intersection.

**Table 1.1 - Recommended Alternative Summary**

EVALUATION MEASURES	NO-BUILD	SEGMENTS				TOTAL
		1	2	3	4	
<b>Engineering Factors</b>						
Right-of-Way to be Acquired in Acres, including pond sites	0	19.78	41.26	43.17	28.71	<b>132.92</b>
Design Costs (millions of dollars) at 15% of construction costs	\$0.000	\$1.366	\$1.638	\$2.057	\$1.808	<b>\$6.869</b>
Right-of-Way Costs including ponds (millions of dollars)	\$0.000	\$2.445	\$3.085	\$5.192	\$2.686	<b>\$13.408</b>
Construction Costs (millions of dollars)* including 10% contingency costs	\$0.000	\$9.108	\$10.920	\$13.712	\$12.056	<b>\$45.795</b>
Construction Engineering & Inspection Costs (millions of dollars) at 17.5% of construction costs	\$0.000	\$1.594	\$1.911	\$2.400	\$2.110	<b>\$8.014</b>
Wetland Mitigation Costs (millions of dollars) (FS 373.4137; 2002-'03 figures; \$83,598.00/ac)	\$0.000	\$0.007	\$0.246	\$0.012	\$0.047	<b>\$0.311</b>
<b>Total Project Cost (millions of dollars)</b>	<b>\$0.000</b>	<b>\$14.520</b>	<b>\$17.800</b>	<b>\$23.371</b>	<b>\$18.707</b>	<b>\$74.398</b>
<b>Social &amp; Cultural Effects</b>						
Residential Relocations	0	0	0	0	0	<b>0</b>
Businesses Damages	0	1	1	2	1	<b>5</b>
Business Relocations	0	0	0	2	0	<b>2</b>
Parcels Affected	0	7	18	40	22	<b>87</b>
Outdoor Advertising Sign Displacements	0	0	0	0	1	<b>1</b>
Churches	0	0	0	0	0	<b>0</b>
Cemeteries	0	0	0	0	0	<b>0</b>
Schools/Day Care Facilities	0	0	0	0	0	<b>0</b>
Medical Facilities	0	0	0	0	0	<b>0</b>
Section 4(f) / Public Parks Affected Area (acres)	0	0	0	0	0	<b>0</b>
Historical / Archaeological Sites	0	0	0	0	0	<b>0</b>
Other Public Services (fire stations, etc.)	0	0	0	0	0	<b>0</b>
<b>Natural Environment Effects</b>						
Wetland Area in Acres	0	0.08	2.95	0.14	0.56	<b>3.72</b>
100-Year Floodplain Area in Acres	0	0.07	0	0	0.16	<b>0.23</b>
Threatened & Endangered Species (0=No habitat to be affected, 1=affected habitat)	0	0	0	0	0	<b>0</b>
<b>Physical Environment Effects</b>						
Air Quality Effects	0	0	0	0	0	<b>0</b>
Potential Contamination Sites (0=No potential contamination sites affected, 1=ROW to be acquired from potentially contaminated property)	0	1	0	0	1	<b>2</b>
Noise Sites Affected	0	16	0	3	2	<b>21</b>

\* Costs based on concrete pavement

3. The FDOT is committed to further coordination during the design phase with the Office of Motor Carrier Compliance concerning access to and re-design of the existing weigh station north of the Cobb Road/US 98 intersection.
4. FDOT is committed to further investigate during the design phase to determine if there is a need for a traffic signal at the Youth Drive intersection for safe access to and from the D.S. Parrott Middle School.
5. The FDOT has prepared an Eastern indigo snake protection plan and has committed to implement its provisions (see **Appendix A**).

### **1.3 REFERENCES**

1. Hernando County MPO Adopted *2025 Long Range Transportation Plan*; Hernando County, Florida; 2002.

## 2.0 INTRODUCTION

### 2.1 PURPOSE OF THIS REPORT

This *Preliminary Engineering Report (PER)* is one in a series of reports prepared as part of the Project Development and Environment (PD&E) Study undertaken by the Florida Department of Transportation for the proposed Cobb Road (CR 485) and US 98 improvement project in Hernando County, Florida. Incorporated in this *PER* are the engineering data and analysis used to define the alternative project concepts, including design criteria, alignments, typical sections, and access features.

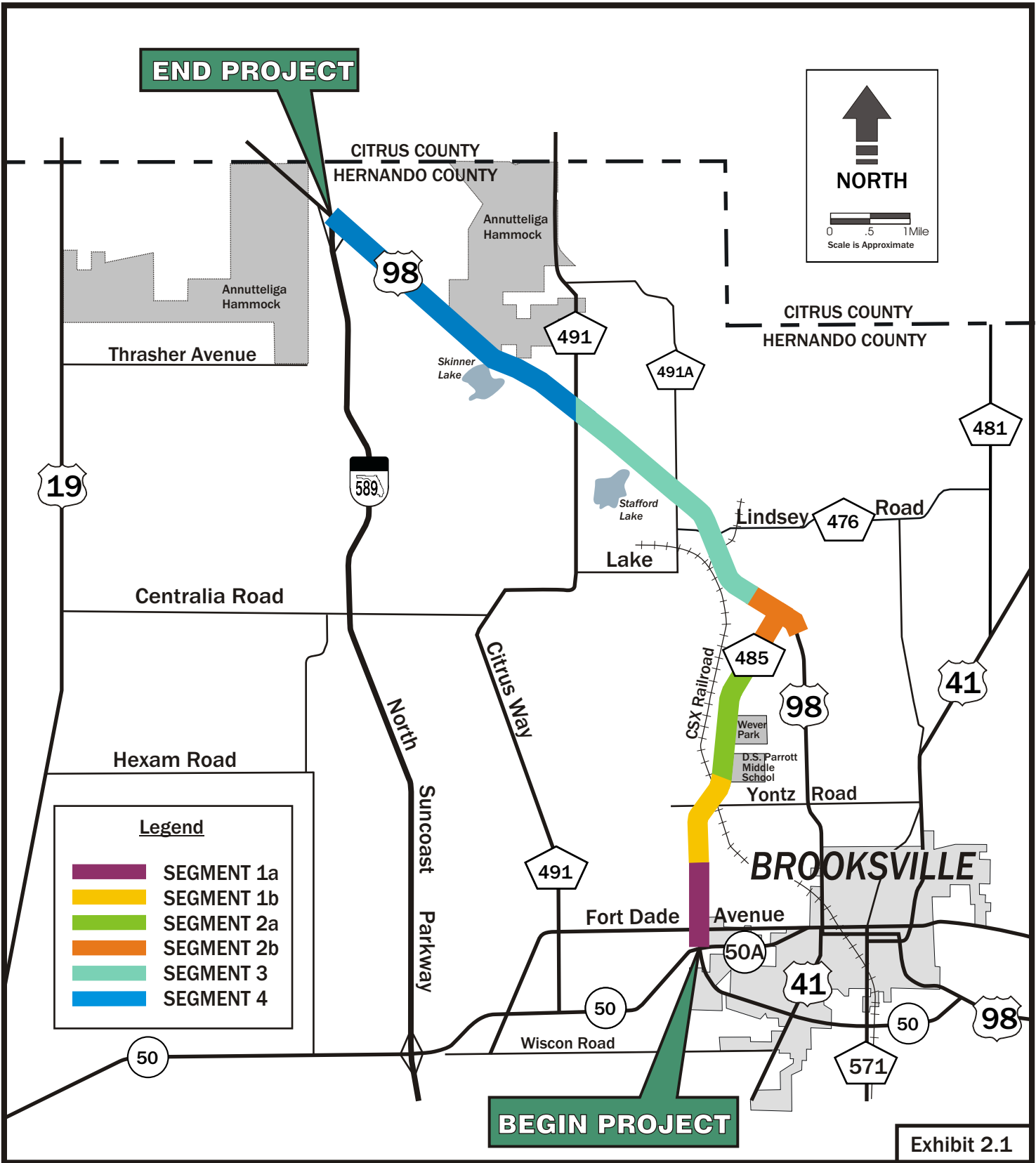
English units of measure are utilized throughout the report.

### 2.2 PROJECT DESCRIPTION

The planned project will improve the capacity and safety of the existing two-lane Cobb Road (CR 485) and a portion of US 98 in Hernando County, Florida. The project study area begins on Cobb Road at SR 50 in the City of Brooksville and extends northward 4.5 miles to US 98. The study area then proceeds 7 miles westward along US 98 to the Suncoast Parkway. These segments of Cobb Road and US 98 are currently two-lane undivided rural arterials. The total length of the planned project is approximately 11.5 miles. The project has been divided into six segments (Segments 1a, 1b, 2a, 2b, 3 and 4) for purposes of analysis throughout this study. The project segmentation is shown on the Project Location Map in **Exhibit 2.1**.

The existing Cobb Road / US 98 corridor provides traffic flow around the west side of the City of Brooksville, ultimately connecting SR 50 with the Suncoast Parkway (SR 589). Traffic growth in Hernando County and in the vicinity of the City of Brooksville will cause Cobb Road and US 98 to become congested if traffic capacity is not added to the system. The need to provide a safer designated bypass route around the City of

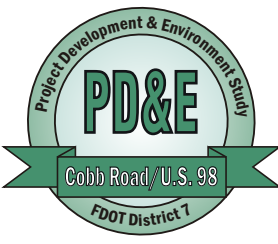




**Legend**

	SEGMENT 1a
	SEGMENT 1b
	SEGMENT 2a
	SEGMENT 2b
	SEGMENT 3
	SEGMENT 4

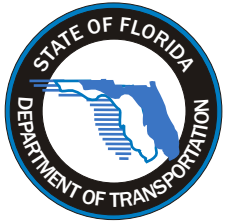
Exhibit 2.1



# Project Location and Segmentation Map

## Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1  
 FAP Nos: 2891 007 P & 2891 008 P



Brooksville is vital, particularly for the large volume of truck traffic associated with three major rock mines and other industrial facilities situated along the project corridor.

Capacity and safety improvements to Cobb Road and US 98, along with the designation of Cobb Road as US 98, represents a long-standing goal of the City of Brooksville and Hernando County. This goal has been incorporated into the Hernando County Metropolitan Planning Organization (MPO) *2025 Long Range Transportation Plan (LRTP<sup>1</sup>)*, which calls for widening the existing roadways to a continuous four-lane divided, controlled access facility.

### **2.3 REFERENCES**

1. Hernando County MPO Adopted *2025 Long Range Transportation Plan*; Hernando County, Florida; 2002.

### 3.0 NEED FOR IMPROVEMENT

The Hernando County Metropolitan Planning Organization (MPO) identified the need for capacity improvements to Cobb Road and US 98 in 1998 during development of the adopted *2025 Long Range Transportation Plan (LRTP<sup>1</sup>)*. The *LRTP<sup>1</sup>* identifies Cobb Road, in conjunction with SR 50, as a desired bypass for truck traffic around the City of Brooksville.

#### 3.1 DEFICIENCIES

##### 3.1.1 Capacity: Existing and Future Levels of Service

Level of Service (LOS) is a concept that allows a qualitative and quantitative description of the performance of a particular highway segment. Service levels range from “A” to “F”, with “A” representing the best service level and “F” the poorest. General descriptions of operating conditions for each of the levels of service according to the *Highway Capacity Manual 2000<sup>2</sup>* are as follows:

- LOS “A” describes completely free-flow conditions. The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway and by driver preferences. Maneuverability within the traffic stream is good. Minor disruptions to flow are easily absorbed without a change in travel speed.
- LOS “B” also indicates free flow, although the presence of other vehicles becomes noticeable. Average travel speeds are the same as in LOS “A”, but drivers have slightly less freedom to maneuver. Minor disruptions are still easily absorbed, although local deterioration in LOS will be more obvious.
- LOS “C” indicates the influence of traffic density on operations becomes marked. The ability to maneuver within the traffic stream is clearly affected by other vehicles. On multilane highways with a free-flow speed (FFS) above 50 mph, the travel speeds reduce somewhat. Minor disruptions can cause serious local

deterioration in service, and queues will form behind any significant traffic disruption.

- LOS “D” represents that the ability to maneuver is severely restricted due to traffic congestion. Travel speed is reduced by the increasing volume. Only minor disruptions can be absorbed without extensive queues forming and the service deteriorating.
- LOS “E” represents operations at or near capacity, an unstable level. The densities vary, depending on the FFS. Vehicles are operating with the minimum spacing for maintaining uniform flow. Disruptions cannot be dissipated readily, often causing queues to form and service to deteriorate to LOS “F”. For the majority of multilane highways with FFS between 45 and 60 mph, passenger-car mean speeds at capacity range from 42 to 55 mph but are highly variable and unpredictable.
- LOS “F” represents forced or breakdown flow. It occurs either when vehicles arrive at a rate greater than the rate at which they are discharged or when the forecast demand exceeds the computed capacity of a planned facility. Although operations at these points, and on sections immediately downstream, appear to be at capacity, queues form behind these breakdowns. Operations within queues are highly unstable, with vehicles experiencing brief periods of movement followed by stoppages. Travel speeds within queues are generally less than 30 mph. Note that the term LOS “F” may be used to characterize both the point of the breakdown and the operating condition within the queue.

According to the Transportation Element of the *Hernando County Comprehensive Plan*<sup>3</sup> and Table 6-1 of the *2002 FDOT Quality / Level of Service Handbook*<sup>4</sup>, the LOS standard for Cobb Road and US 98 shall be “C” for the peak-hour traffic volume.

The majority of the existing segments and intersections within the PD&E study limits are operating at adequate LOS based on the existing traffic equivalent of a design hour. The segment of roadway displaying the worst conditions is the segment from SR 50 to Yontz Road, which currently operates at LOS E/D during the hypothetical design hour.

By the design year (2025), US 98 is projected to be operating at LOS D for the No-Build Alternative. For the No-Build Alternative, Cobb Road is projected to be operating at LOS E between SR 50 and Fort Dade Avenue, LOS D from Fort Dade Avenue to Yontz Road and LOS C from Yontz Road to US 98. These projections represent the results of a No-Build Alternative with implementation of the Suncoast Parkway Project 2. The proposed Suncoast Parkway Project 2 is an extension of the existing Suncoast Parkway (Project 1), which currently terminates at the northern end of the Cobb Road/US 98 project limits. The proposed Suncoast Parkway Project 2 would extend through Citrus County and connect to US 19 in the northern part of the county.

### **3.1.2 Evacuation Routes and Emergency Services**

According to the *Hernando County Comprehensive Plan*<sup>3</sup>, Cobb Road is intended to serve as a future evacuation route. The existing two-lane undivided arterial would not provide an efficient or safe evacuation due to capacity deficiencies. US 98 is currently identified as an evacuation route.

## **3.2 SAFETY**

Crash records from Hernando County's CARS 2000 (Computerized Accident Record System 2000) indicated that 53 crashes occurred within the Cobb Road portion of the project study area over the five-year period between 1995 and 1999, an average of approximately 10 crashes per year. In addition, during the five-year period, there were 12 injuries and no fatalities.

Summary crash data was obtained from the FDOT, reporting a total of 48 crashes occurring on US 98 from Cobb Road to the Suncoast Parkway during the years from 1995 to 1999. These crashes resulted in two fatalities and 68 injuries. Crash information is discussed further in Section 4.1.9. Clear zone requirements and other safety parameters are found in Section 5.0.

### 3.3 CONSISTENCY WITH TRANSPORTATION PLANS

The proposed capacity improvements to Cobb Road and US 98 are consistent with the Hernando County MPO 2025 LRTP<sup>1</sup>. Cobb Road and US 98 are essential elements of the State Transportation Plan. Cobb Road and US 98, which are not limited-access facilities, will meet state design criteria and standards, including level of service standards, noted in **Section 3.1.1** above, and right-of-way protection outlined in the Transportation Element of the *Hernando County Comprehensive Plan*<sup>3</sup>.

### 3.4 SOCIAL AND ECONOMIC DEMANDS

Hernando County experienced substantial growth over the past two decades and will continue to experience growth in population and in residential and commercial development according to population projections. Hernando County is part of the 4-county Tampa-St. Petersburg-Clearwater Metropolitan Statistical Area (MSA), sharing close economic and commuter ties with Hillsborough, Pasco and Pinellas Counties to the south. The counties have recently become additionally linked through the construction of the Suncoast Parkway, which provides a direct route from the Veterans Expressway in Tampa to US 98 in northern Hernando County. Hernando County is expected to experience further growth with the implementation of the Suncoast Parkway, which provides additional commuter ties with the Tampa Bay area. Corresponding development will demand acceptable levels of police and fire protection, emergency medical vehicle response time, and access to employment, shopping, schools, churches, community centers, and social service agencies. Furthermore, an alternate route for vehicles, particularly trucks, traveling around the City of Brooksville will come into demand. For Hernando County, particularly around the City of Brooksville, many of these social and economic demands will be better served with the proposed capacity improvements of Cobb Road and US 98 and the associated designation of an alternate route around the City of Brooksville. As such, capacity improvements associated with this project will have a positive social and economic impact on the citizens of Hernando County by improving local and regional accessibility.

### **3.4.1 Population and Employment Trends**

Hernando County's population has increased consistently over the past 20 years, with dramatic growth occurring in the 1980's. According to the Hernando County Economic Development Study of April 2001, Hernando County's population grew by 125% between 1980 and 1990. This rapid growth slowed between 1990 and 2000 with an overall increase of 30%. Growth rates are projected to be 37% between 2000 and 2015 and 18% between 2015 and 2025. Major employment centers within and adjacent to the study area mainly consist of the D.S. Parrott Middle School and three major mining facilities.

### **3.5 REFERENCES**

1. Hernando County MPO Adopted *2025 Long Range Transportation Plan*; Hernando County, Florida; 2002.
2. *Highway Capacity Manual*; 2000.
3. *Hernando County Comprehensive Plan*; Hernando County Board of County Commissioners; Adopted June 1989 and as amended.
4. *Quality / Level of Service Handbook*; Florida Department of Transportation, 2002.

## 4.0 EXISTING CONDITIONS

### 4.1 EXISTING ROADWAY CHARACTERISTICS

#### 4.1.1 Functional Classifications

According to the *Hernando County Comprehensive Plan*<sup>1</sup> – Transportation Element, Cobb Road is currently classified as a collector. According to FDOT District Seven *Straight Line Diagrams*<sup>2</sup>, US 98 is classified as a rural arterial.

#### 4.1.2 Typical Sections

##### 4.1.2.1 Existing Cobb Road (CR 485) Typical Sections

Cobb Road for a distance of about 1000 ft. from SR 50 to Shadyside Drive is a 4-lane urban divided facility, with 12-ft. inside and 14-ft. outside lanes, a 24-ft. raised median, and 5-ft. sidewalks within a 100-ft. (min.) right-of-way. This section has previously been upgraded to a four-lane facility in conjunction with the Cobb Road/SR 50 intersection modification. The posted speed is 35 mph. The existing Cobb Road urban typical section is shown in **Exhibit 4.1**.

The existing Cobb Road rural typical section from Shadyside Drive to US 98 consists of one 12-ft. lane in each direction, centered within a varying right-of-way width of 120-160 ft. The roadway is a rural undivided facility, with 10-ft. shoulders (4-ft. paved) as well as roadside swale ditches to capture and route stormwater. There are no sidewalks in this roadway segment. The posted speed is generally 55 mph. The existing Cobb Road rural typical section is shown in **Exhibit 4.2**.



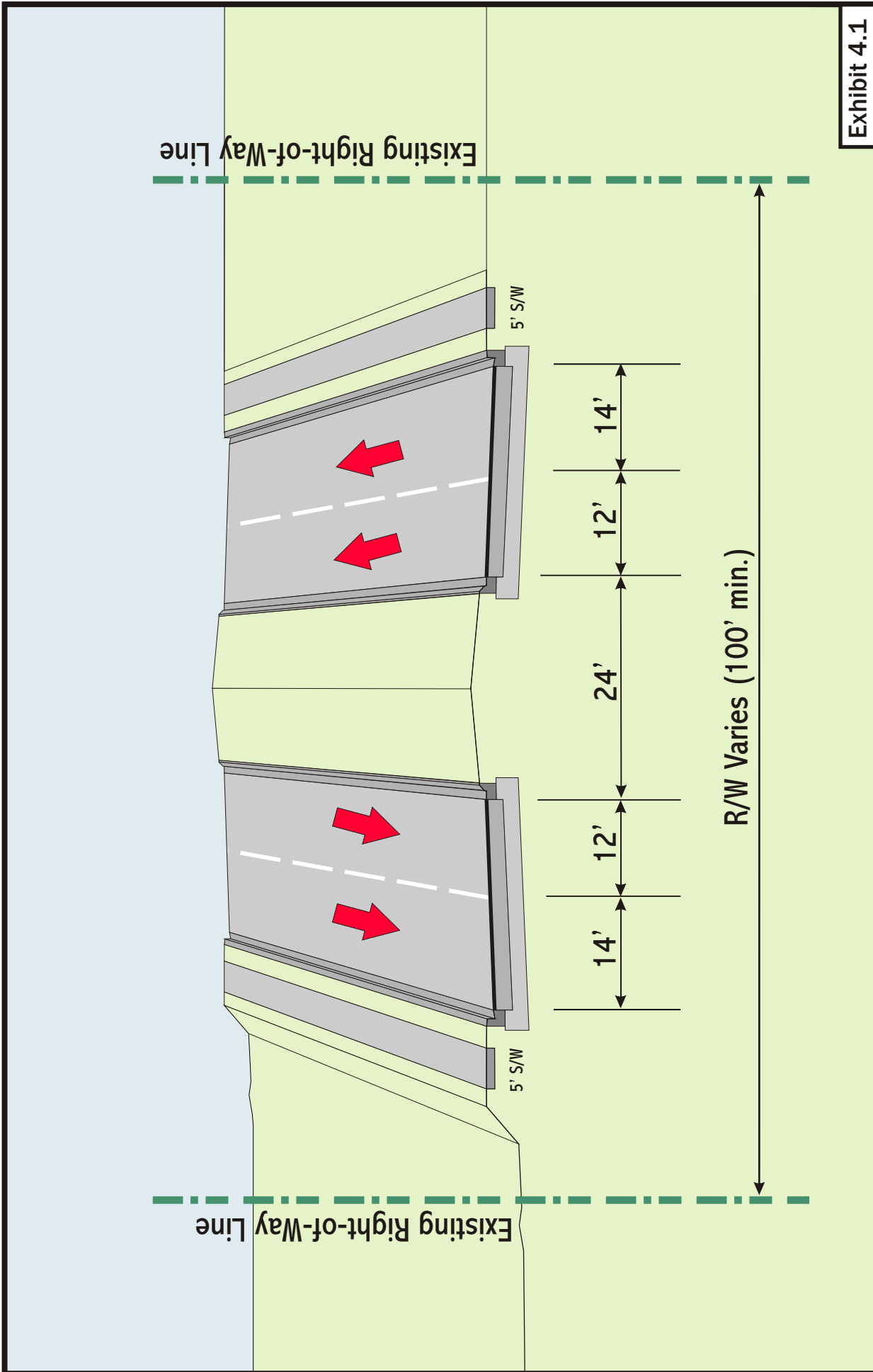
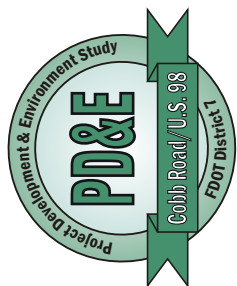


Exhibit 4.1



# COBB ROAD EXISTING URBAN TYPICAL SECTION

(From SR 50 to Shadyside Drive)  
 Cobb Road (CR 485) / US 98 PD&E Study  
 WPI Segment Nos: 257299 1 & 405017 1  
 FAP Nos: 2891 007 P & 2891 008 P



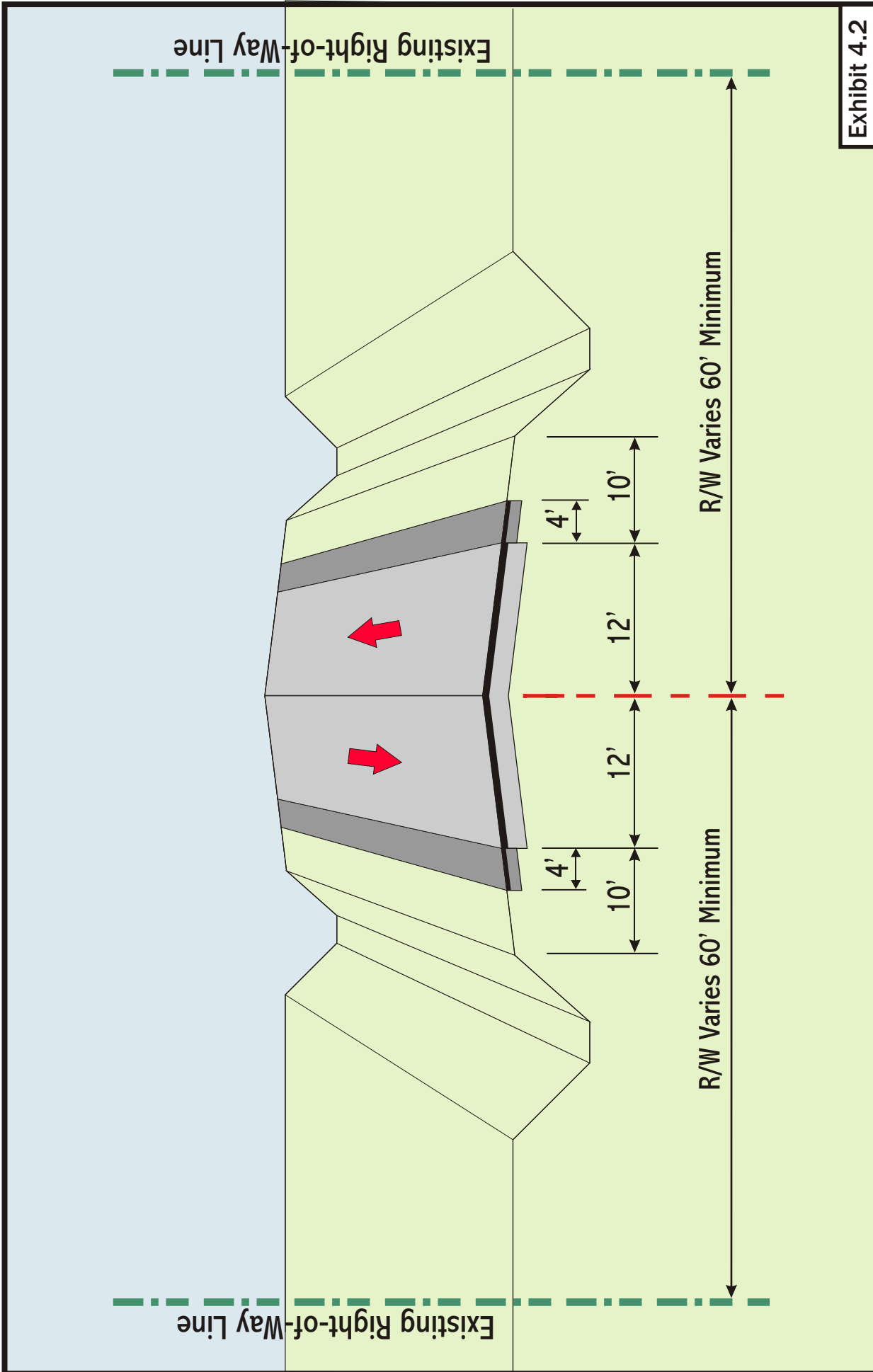
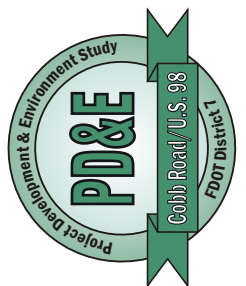


Exhibit 4.2



**COBB ROAD EXISTING RURAL TYPICAL SECTION**  
 (From Shadyside Drive to US 98)  
 Cobb Road (CR 485) / US 98 PD&E Study  
 WPI Segment Nos: 257299 1 & 405017 1  
 FAP Nos: 2891 007 P & 2891 008 P



#### 4.1.2.2 Existing US 98 Typical Section

US 98 from Cobb Road to Suncoast Parkway consists of a two-lane undivided rural roadway with 12-ft. lanes, 8-ft. shoulders (4-ft. paved) and a centerline alignment offset 32 ft. to the south within the 200-ft. (typical) existing right-of-way. The highway was originally constructed in this manner in order to accommodate the future 4-lane widening to the north of the existing lanes. There are no sidewalks on this facility. The posted speed is 60 mph. The existing US 98 rural typical section is shown in **Exhibit 4.3**.

#### 4.1.3 **Pedestrian and Bicycle Facilities**

No pedestrian or bicycle facilities are provided with the existing Cobb Road or US 98 facilities within the project length, with the exception of the segment along Cobb Road from SR 50 to Shadyside Drive, which has been modified in conjunction with the SR 50 improvement project from Colorado Street to Cobb Road. This segment includes two 5-ft. concrete sidewalks, one on each side of the roadway, to accommodate pedestrians and 14-ft. outside lanes to accommodate bicyclists.

#### 4.1.4 **Right-of-Way and Property Lines**

The existing right-of-way along Cobb Road from SR 50 to Fort Dade Avenue is approximately 100 ft. wide, with the exception of a 70-ft. length across from Shadyside Drive that has a width of 140 ft. and about a 200-ft. length south of Fort Dade Avenue that has a width of 142 ft. The width of the right-of-way from Fort Dade Avenue to Old Cobb Road is approximately 110 ft. and from Old Cobb Road to Yontz Road approximately 120 ft. The width of the right-of-way varies from Yontz Road to US 98 between 120 ft. and 160 ft.

The existing right-of-way along US 98 from Cobb Road to Landfill Road is 200 ft. Just north of Landfill Road, the width of the right-of-way increases to 264 ft. in conjunction

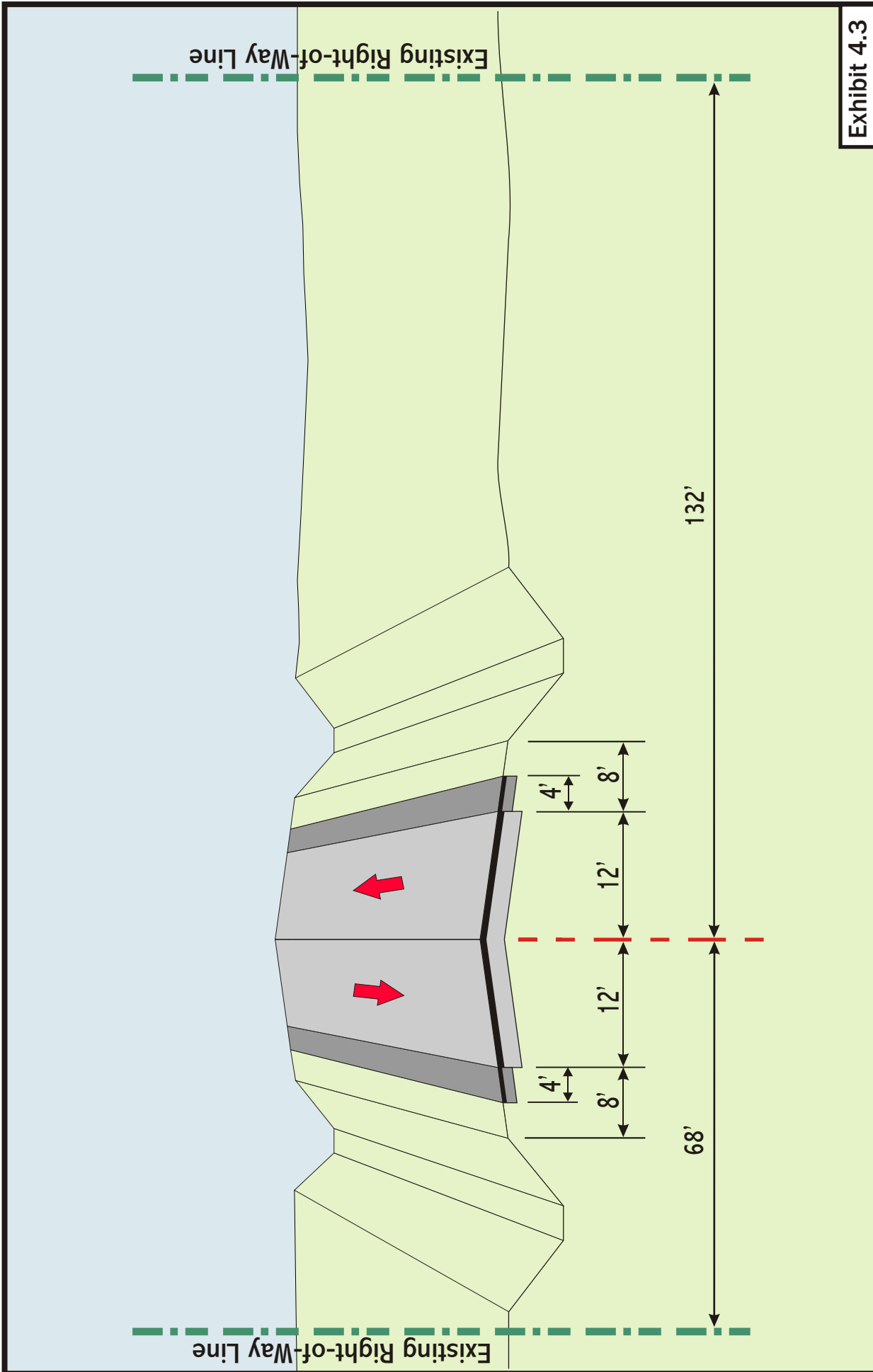
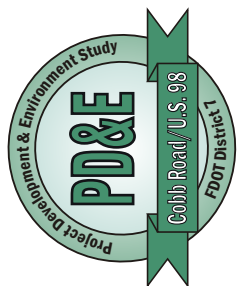


Exhibit 4.3



**US 98 EXISTING RURAL TYPICAL SECTION**  
 (From Cobb Road to North Suncoast Parkway)  
 Cobb Road (CR 485) / US 98 PD&E Study  
 WPI Segment Nos: 257299 1 & 405017 1  
 FAP Nos: 2891 007 P & 2891 008 P



with the construction of the Suncoast Parkway. The right-of-way width just west of the World Woods Golf Course is 464 ft. for a length of 250 ft.

#### **4.1.5 Horizontal Alignment**

Cobb Road runs generally from south to north. Just north of SR 50 is a curve with a degree of curvature,  $D = 1^{\circ} 30' 0''$  right. Just north of Lee Avenue is a curve with  $D = 1^{\circ} 30' 0''$  left. Approximately  $\frac{2}{3}$  mile south of Yontz Road is a curve with  $D = 0^{\circ} 4' 52''$  right. Approximately  $\frac{1}{3}$  mile south of Yontz Road is a curve with  $D = 0^{\circ} 10' 0''$  left. At the intersection of Yontz Road is a curve with  $D = 4^{\circ} 0' 0''$  right. Approximately  $\frac{1}{2}$  mile north of Yontz Road is a curve with  $D = 2^{\circ} 0' 0''$  left. Approximately  $\frac{1}{2}$  mile north of Youth Drive is a curve with  $D = 2^{\circ} 0' 0''$  right.

US 98 runs generally from southeast to northwest. Just south of Cobb Road along US 98 is a curve with  $D = 1^{\circ} 0' 0''$  left. Near the CSX Railroad crossing is a curve with  $D = 2^{\circ} 0' 0''$  right. At the intersection of Lake Lindsey Road is a curve with  $D = 3^{\circ} 0' 0''$  left. Approximately  $\frac{1}{2}$  mile north of Lake Lindsey Road is a curve with  $D = 0^{\circ} 30' 0''$  left. Approximately one mile north of Lake Lindsey Road is a curve with  $D = 1^{\circ} 0' 0''$  right. Just south of CR 491 is a curve with  $D = 0^{\circ} 30' 0''$  left. Approximately one mile north of CR 491 is a curve with  $D = 2^{\circ} 0' 0''$  left and approximately  $\frac{1}{4}$  mile north is a final curve with  $D = 2^{\circ} 0' 0''$  right. Overall, curves along Cobb Road and US 98 are gentle. These horizontal curves meet current design standards.

#### **4.1.6 Vertical Alignment**

The existing vertical alignment of Cobb Road is generally flat with one crest curve ( $K=240$ ) and two sag curves ( $K=250, 280$ ) in the vicinity of Yontz Road. Existing elevations along Cobb Road range from 80 ft. to 176 ft. NGVD.

The existing vertical alignment of US 98 is gently rolling, including 8 crest curves and 17 sag curves. The existing crest curve K values vary between 155 and 305. The K values

of the existing sag curves vary between 150 and 435. Existing elevations along US 98 range from 57 ft. to 155 ft. NGVD.

#### 4.1.7 Drainage

Stormwater collection and conveyance along US 98 is achieved by means of 35 cross drains. Each cross drain location is detailed in **Table 4.1**. A survey of the project study area, including existing cross drains, was conducted in the fall of 2001. **Table 4.1** reflects the existing cross drain information from the survey, as well as information from existing roadway plans data, FDOT D-7 *Straight Line Diagrams*<sup>2</sup> and field reviews. The centerline survey of Cobb Road begins with station 30 + 00 at SR 50. Station 30 + 00 was assumed to be Milepost 0.00 for purposes of this study.

**Exhibit 4.4** shows the primary drainage basin boundaries potentially affected by the proposed improvements, as well as the estimated cross drain locations. A *Location Hydraulic Report*<sup>4</sup> (LHR) was prepared as part of this PD&E Study. The findings of the LHR are incorporated by reference into this PER.

#### 4.1.8 Geotechnical Data

A *Preliminary Geotechnical Report*<sup>5</sup> was prepared as part of this PD&E Study by Williams Earth Sciences, Inc. The findings of the *Preliminary Geotechnical Report*<sup>5</sup> are incorporated by reference into this PER.

##### 4.1.8.1 Physiographic Setting

Hernando County lies in the Coastal Plain Province of Fenneman (1938) and in the Tertiary Highlands, the River Valley Lowlands and the Terraced Coastal Lowlands of Vernon (1951). The average annual rainfall on the area is about 55 inches. The study area is characterized by limestone karst and sinkholes.

**Table 4.1 Cobb Road and US 98 Existing Cross Drain Data**

Cross Drain Site Number	Location		Source <sup>(1)</sup> (Structure No.)	No. Pipes or Barrels	Size and Material	Length	
	C/L Survey Station	Milepost					
Cobb Road	1	30 + 84.00	0.019	Survey, Field	2	10' X 8' CBC	343'
	2	44 + 19.83	0.314	Survey, Field	1	30" RCP	153'
	3	52 + 97.00	0.480	Survey	1	24" RCP	127'
	4	72 + 00.46	0.841	Survey, Field	1	36" RCP	97'
	5	121 + 47.40	1.781	Survey, Field	1	8' X 4' CBC	~200'
	6	125 + 85	1.861	Survey, A (S-2), Field	1	30" RCP	141'
	7	131 + 25	1.961	Survey, A (S-3)	2	36" CMP	137', 144'
	8	137 + 76	2.085	Survey, A (S-4), Field	3	48" CMP	116'
	9	165 + 00	2.601	Survey, A (S-5), Field	2	36" CMP	86'
	10	184 + 70	2.976	Survey, A (S-6), Field	1	30" CMP	94'
	11	198 + 60	3.239	Survey, A (S-7), Field	1	30" CMP	90'
	12	204 + 00	3.341	Survey, A (S-8), Field	1	24" CMP	72'
	13	229 + 00	3.814	Survey, A (S-9), Field	2	36" CMP	86'
	14	248 + 25	4.179	Survey, A (S-10), Field	2	36" CMP	111'
	15	260 + 58	4.412	Survey, A (S-11), Field	2	24" RCP	119'
	16	264 + 47	4.485	Survey, A (S-12), Field	2	36" RCP	173'
US 98	17	351 + 65.60	4.592	Survey, B (S-13), Field	4	48" RCP	93'
	18	358 + 93.40	4.730	Survey, C (S-1), Field	1	30" RCP	108'
	19	369 + 88.39	4.937	Survey, C (S-16), Field	1	24" RCP	65'
	20	396 + 23.23	5.436	Survey, B (S-19), Field	1	48" RCP	88'
	21	413 + 89.35	5.771	Survey, B (S-21), Field	2	42" RCP	121'
	22	433 + 99.50	6.152	Survey, B (S-22), Field	1	30" RCP	87'
	23	460 + 50.30	6.654	Survey, B (S-25), Field	1	48" RCP	143'
	24	465 + 11.00	6.741	Survey, SLD	1	30" RCP	97'
	25	473 + 39.43	6.898	Survey, SLD, Field	1	48" RCP	111'
	26	484 + 40.26	7.106	Survey, B (S-28), Field	1	24" RCP	86'
	27	518 + 85.57	7.759	Survey, B (S-30), Field	2	36" RCP	90'
	28	537 + 69.85	8.116	Survey, D (S-1)	1	24" RCP	100'
	29	547 + 54.05	8.302	Survey, E (S-2), Field	1	30" RCP	85'
	30	596 + 52.56	9.230	Survey, E (S-3), Field	1	42" RCP	90'
	31	623 + 51.78	9.741	Survey, E (S-4), Field	1	24" RCP	86'
	32	652 + 52.16	10.290	Survey, SLD, Field	1	24" RCP	93'
	33	674 + 44.31	10.706	Survey, E (S-6), Field	3	77" X 50" CMP	96'
	34	684 + 52.62	10.896	Survey, Field	1	15" RCP	95'
	35	690 + 45.04	11.009	Survey, E (S-7), Field	3	72" X 48" CMP/RCP	174'

(1) Sources:

- (A) Construction Plans: CR 485 (SPN 08590-3606, FAP MARS-1599(1); Date Plans Approved - March 22, 1985)
- (B) Construction Plans: US 98 (Resurfacing/Widening) SPN 08080-3902, FAP No. HES-289-1(4); Date Plans Approved - November 17, 1987
- (C) Construction Plans: US 98 (Weigh Station) SPN 08080-3516; Date Plans Approved - February 7, 1992
- (D) Construction Plans: US 98 (Resurfacing/Widening) SPN 08080-3517, FPI 254838-1-52-01; Date Plans Submitted - October 15, 1999
- (E) Construction Plans: US 98 (Resurfacing/Widening) SPN 08080-3511, FAP No. F-289-1(3); Date Work Complete - February 19, 1987

(2) Note: Cobb Road CL Survey STA 265+00 approximately equals US 98 CL Survey STA 343+70

(3) Legend:

- CBC = Concrete Box Culvert
- RCP = Reinforced Concrete Pipe
- CMP = Corrugated Metal Pipe
- SLD - Straight Line Diagram

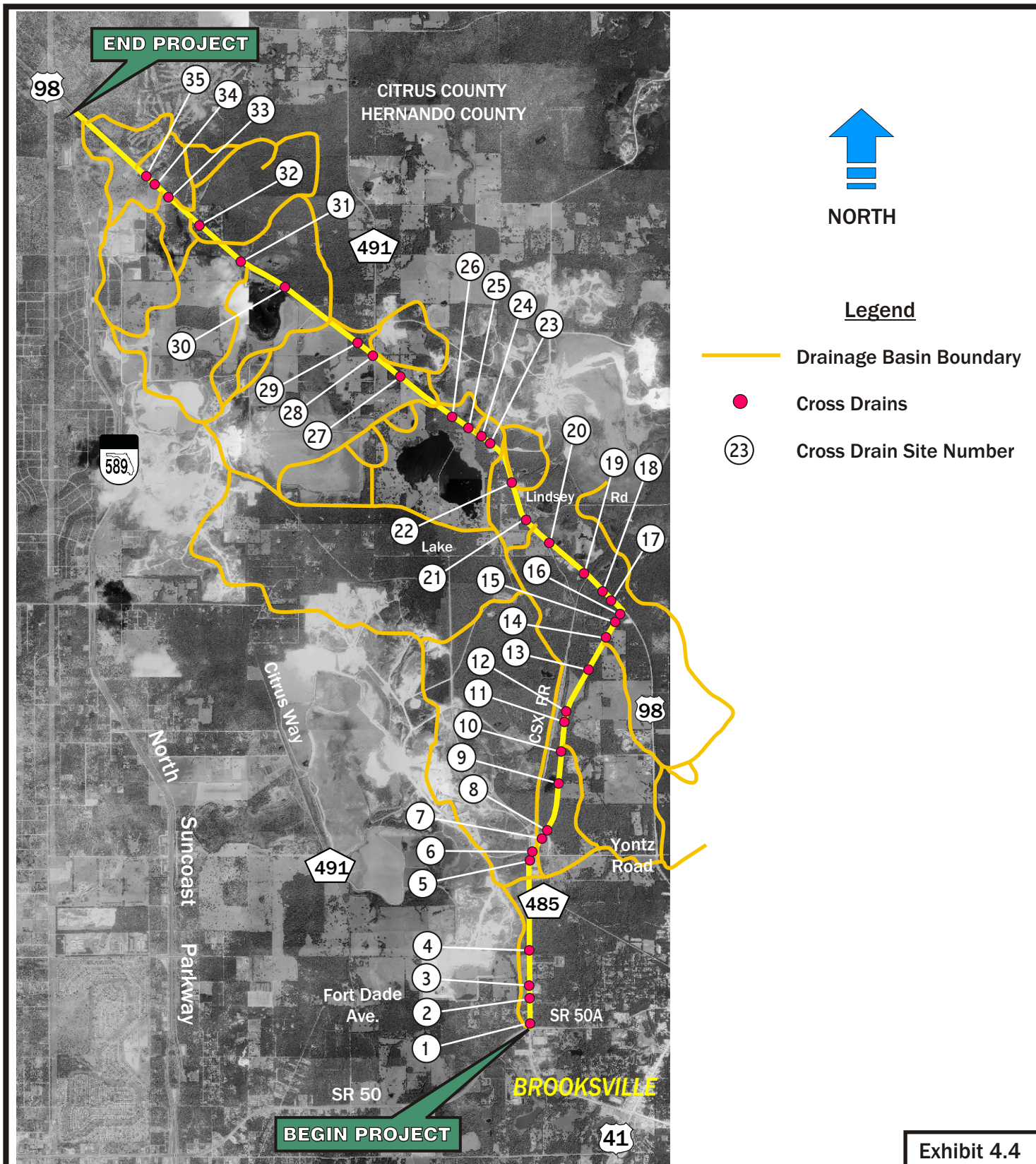


Exhibit 4.4

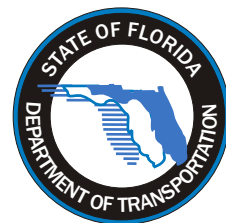


## Drainage Sub-Basin Boundaries with Cross Drains

### Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1

FAP Nos: 2891 007 P & 2891 008 P





#### 4.1.8.2 Regional Groundwater Characteristics

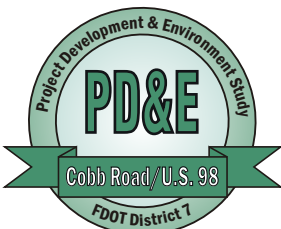
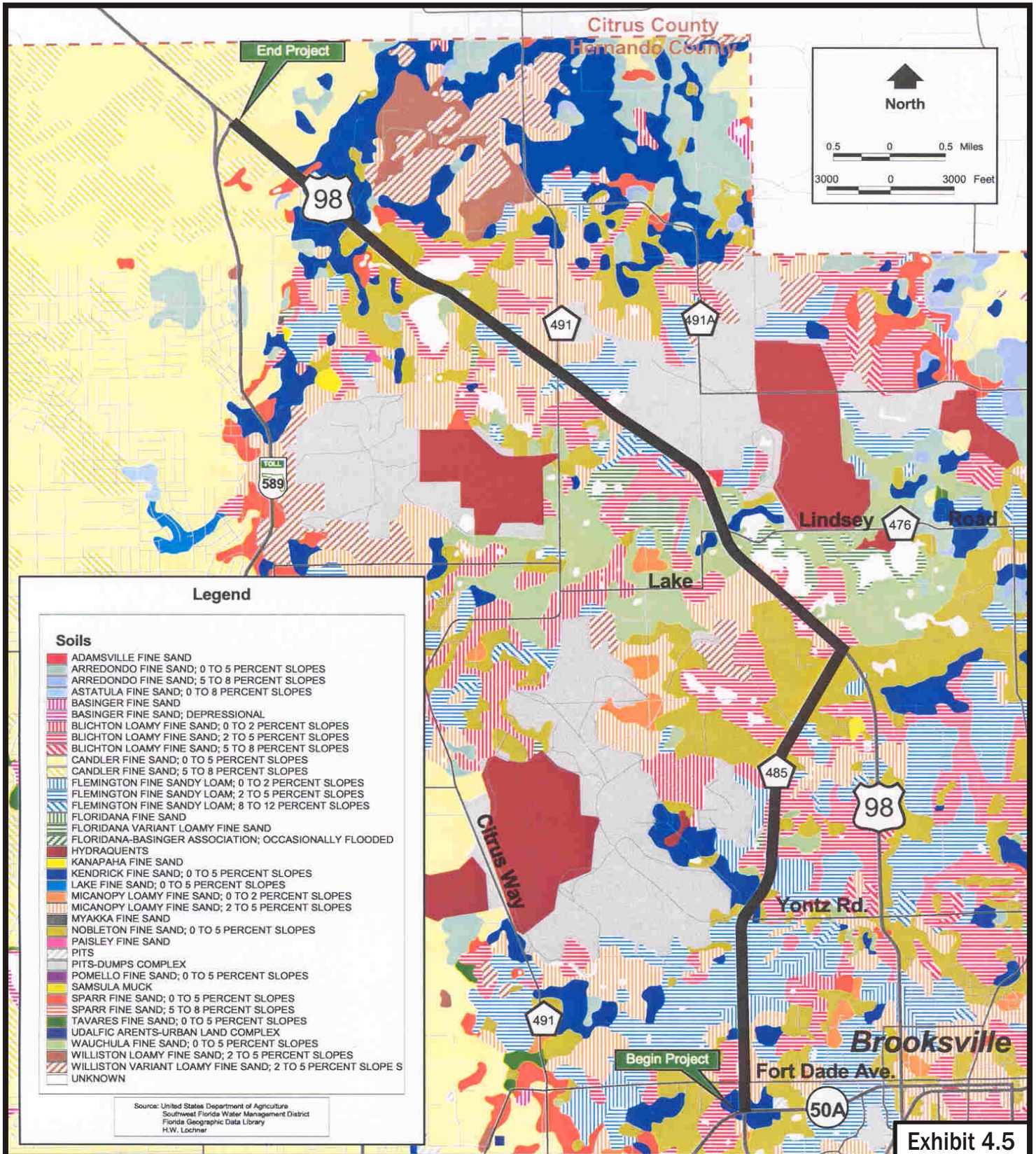
Surface drainage of the area is poorly developed. Hernando County is drained primarily by underground seepage. This drainage is interrupted by prolonged above-normal rainfall, which raises the groundwater level so that sinkholes that normally act as surface drains become springs and add to the excessive surface water. Area limestone formations form the Floridan aquifer, which is the primary source of groundwater. The limestones are generally permeable, but the highest permeability usually occurs in or near hard zones in the limestone. The overall direction of groundwater potentiometric surface is from southeast to northwest.

#### 4.1.8.3 Soils

The Natural Resources Conservation Service's (NRCS, formerly the Soil Conservation Service) *Soil Survey for Hernando County*<sup>3</sup> was reviewed with respect to geology and near-surface soil conditions in the project area and shows that multiple soil map units occur within the study area. The primary soils shown along the area of the existing alignment are those of the Nobleton-Blichton-Flemington upland soil association. The soils mapped by the NRCS Soil Survey within the project limits are shown on **Exhibit 4.5** and are listed below:

##### NRCS Soil Survey Classification/Map Symbol Numbers

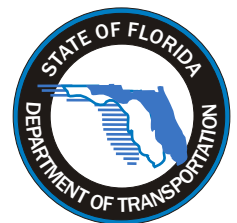
- Soil Type 1 – Adamsville Fine Sand
- Soil Type 6 – Arredondo Fine Sand
- Soil Type 7 – Arredondo Fine Sand
- Soil Type 8 – Astatula Fine Sand
- Soil Type 9 – Basinger Fine Sand
- Soil Type 10 – Basinger Fine Sand, Depressional
- Soil Type 11 – Blichton Loamy Fine Sand
- Soil Type 12 – Blichton Loamy Fine Sand
- Soil Type 13 – Blichton Loamy Fine Sand
- Soil Type 14 – Candler Fine Sand
- Soil Type 15 – Candler Fine Sand
- Soil Type 20 – Flemington Fine Sandy Loam



# General Soils Map

## Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1  
 FAP Nos: 2891 007 P & 2891 008 P



Soil Type 21 – Flemington Fine Sandy Loam  
Soil Type 22 – Flemington Fine Sandy Loam  
Soil Type 23 – Floridana Fine Sand  
Soil Type 24 – Floridana-Basinger Association  
Soil Type 25 – Floridana Variant Loamy Fine Sand  
Soil Type 27 – Hydraquents  
Soil Type 28 – Kanapaha Fine Sand  
Soil Type 29 – Kendrick Fine Sand  
Soil Type 31 – Lake Fine Sand  
Soil Type 33 – Micanopy Loamy Fine Sand  
Soil Type 34 – Micanopy Loamy Fine Sand  
Soil Type 35 – Myakka Fine Sand  
Soil Type 36 – Nobleton Fine Sand  
Soil Type 38 – Paisley Fine Sand  
Soil Type 41 – Pits  
Soil Type 42 – Pits-Dumps Complex  
Soil Type 43 – Pomello Fine Sand  
Soil Type 46 – Samsula Muck  
Soil Type 47 – Sparr Fine Sand  
Soil Type 48 – Sparr Fine Sand  
Soil Type 49 – Tavares Fine Sand  
Soil Type 50 – Udalfic Arents-Urban Land Complex  
Soil Type 52 – Wauchula Fine Sand  
Soil Type 55 – Williston Loamy Fine Sand  
Soil Type 56 – Williston Variant Loamy Fine Sand

#### 4.1.9 Crash Data

Crash data was analyzed for the corridor in two segments: Cobb Road and US 98. This was done as a consequence of two different sources of data with two somewhat different levels of detail. For Cobb Road, Hernando County's CARS 2000 (Computerized Accident Record System 2000) was utilized. For US 98, the state FDOT crash record system was utilized.

##### 4.1.9.1 Cobb Road Segment

**Table 4.2** summarizes the Cobb Road crash data. Crash records indicated that 53 crashes occurred within the Cobb Road portion of the project study area over the five-year period between 1995 and 1999. This accounts for approximately 10 crashes per year. In

addition, during the five-year period, there were 12 injuries and no fatalities. The predominant crashes on Cobb Road involve property damage only (PDO). The total crashes for the five-year period accounted for a vehicle damage loss of approximately \$184,455. The most significant crash type was right angles followed by rear end crashes. Further review of the crash detail lists found that, of the 53 total crashes, 39 occurred at 3 locations: Yontz Road (13), SR 50 (13) and Fort Dade Road (13). No other crash type stands out as significant.

**Table 4.2 Cobb Road Crash Data Summary**

<b>Years.....</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>5 Yr. Total</b>	
<b>CRASH GENERALITIES</b>							<b>Yearly Avg</b>
Fatalities	0	0	0	0	0	0	0
Injuries	3	3	0	2	4	12	2.4
Property Damage Only	12	8	7	8	6	41	8.2
Total Crashes	15	11	7	10	10	53	10.6
<b>CRASH DIAGNOSTICS – First Harmful Event</b>							<b>Percent of 5 year Total Crashes</b>
Rear End Collision	2	1	0	3	1	7	13.2 %
Right Angle Collision	9	5	1	4	2	21	39.6 %
Left Turn Collision	0	0	1	0	1	2	3.8 %
Right Turn Collision	0	0	0	1	1	2	3.8 %
Sideswipe Collision	0	0	0	1	0	1	1.9 %
Backed into Collision	0	0	1	0	1	2	3.8 %
Collision w/ Pedestrian	0	0	0	0	1	1	1.9 %
Collision w/ Animal	1	1	0	0	0	2	3.8 %
MV Hit Utility / Light Pole	0	0	0	0	1	1	1.9 %
MV Hit Fence	1	0	1	0	0	2	3.8 %
MV Hit Crash Attenuator	0	0	0	0	1	1	1.9 %
MV Hit Other Fixed Object	1	0	0	0	0	1	1.9 %
MV Hit Movable Object in Road	0	0	1	0	0	1	1.9 %
MV Ran Into Ditch / Culvert	0	0	1	0	0	1	1.9 %
MV Overturned	0	1	1	0	1	3	5.7 %
All Other...	1	3	0	1	0	5	9.4 %

**PRELIMINARY ENGINEERING REPORT  
COBB ROAD (CR 485) / US 98 PD&E STUDY**

<b>CRASH DIAGNOSTICS – Contributing Cause Driver</b>						<b>3 Yr. Total (27)</b>	<b>Percent of 3 year Total Crashes</b>
No Improper Driving Action	0	0	2	1	1	4	14.8 %
Careless Driving	0	0	2	3	4	9	33.3 %
Failed to Yield Right-of-Way	0	0	0	1	4	5	18.5 %
Improper Backing	0	0	0	0	1	1	3.7 %
Improper Turn	0	0	1	1	0	2	7.4 %
Disregarded Stop Sign	0	0	0	1	0	1	3.7 %
Failed to Maintain Equipment / Vehicle	0	0	1	0	0	1	3.7 %
Unknown	15	11	1	3	0	4	14.8 %
<b>CRASH DIAGNOSTICS – Lighting Conditions</b>						<b>3 Yr. Total (27)</b>	<b>Percent of 3 year Total Crashes</b>
Daylight	0	0	3	6	8	17	63.0 %
Dark (Street Light)	0	0	0	0	1	1	3.7 %
Dark (No Street Light)	0	0	3	1	1	5	18.5 %
Unknown	15	11	1	3	0	4	14.8 %
<b>CRASH DIAGNOSTICS – Roadway Surface Conditions</b>						<b>3 Yr. Total (27)</b>	<b>Percent of 3 year Total Crashes</b>
Dry	0	0	6	7	7	20	74.1 %
Wet	0	0	0	0	3	3	11.1 %
Unknown	15	11	1	3	0	4	14.8 %
<b>CRASH COST ANALYSIS</b>							
	YEAR			ECONOMIC LOSS			
	1995			\$35,700.00			
	1996			\$31,180.00			
	1997			\$21,450.00			
	1998			\$56,875.00			
	1999			\$39,250.00			
	AVERAGE CRASH \$ LOST PER YEAR			\$36,891.00			
	AVERAGE COST PER CRASH			\$3,480.00			

Many unknowns were reported for contributing cause driver, lighting conditions and roadway surface conditions in the years 1995 and 1996. Therefore, a three-year average (1997, 1998 and 1999) was used for those parameters, based on a total of 27 crashes.

Based on the three-year averages, crashes on Cobb Road are most frequently a result of careless driving in the daylight and in dry conditions.

4.1.9.2 US 98 Segment

**Table 4.3** summarizes the US 98 crash data. Crash records indicated that 48 crashes occurred on US 98 from Cobb Road to the Suncoast Parkway over the five-year period between 1995 and 1999. This accounts for approximately 10 crashes per year. In addition, during the five-year period, there were two fatalities and 68 injuries. The total crashes for the five-year period accounted for an economic loss of approximately \$10,240,400. This includes a wide range of losses, including, but not limited to, vehicle damage losses, medical losses and losses due to missed work.

**Table 4.3 US 98 Crash Data Summary**

Years.....	1995	1996	1997	1998	1999	5 Yr. Total	
<b>CRASH GENERALITIES</b>							<b>Yearly Avg</b>
Fatalities	1	0	0	1	0	2	0.4
Injuries	25	10	10	13	10	68	13.6
Property Damage Only	2	1	3	3	4	13	2.6
Total Crashes	12	9	8	10	9	48	9.6
<b>CRASH DIAGNOSTICS</b>							<b>Percent of 5 year Total Crashes</b>
Wet or Slippery	1	1	0	0	2	4	8.3%
Careless Driving	2	3	2	4	2	13	27.1%
Failed to Yield ROW	2	3	3	2	3	13	27.1%
Improper Lane Change	0	0	0	0	0	0	0%
Under the Influence (alcohol/drugs)	0	0	0	1	2	3	6.3%
Disregarded Safety Signal	2	0	1	1	1	5	10.4%
Other	6	3	2	2	1	14	29.2%
Truck	1	1	2	1	1	6	12.5%
At/Infl'd by Intersection	6	6	6	6	7	31	64.6%
Daylight	7	7	5	4	5	28	58.3%
Dusk/Dawn	1	1	0	1	0	3	6.3%
Dark (w/ and w/o street lights)	4	1	3	5	4	17	35.4%

**PRELIMINARY ENGINEERING REPORT  
COBB ROAD (CR 485) / US 98 PD&E STUDY**

7:00 a.m. to 9:59 a.m.	1	1	2	0	2	6	12.5%
Other a.m.	3	1	2	5	4	15	31.3%
3:00 p.m. to 5:59 p.m.	0	3	3	1	0	7	14.6%
Other p.m.	8	4	1	4	3	20	41.7%
Resident of County	8	8	3	8	6	33	35.5%
Non-Resident of County	18	8	11	11	12	60	64.5%
Direction Northwest bound	6	6	6	2	6	26	54.2%
Direction Southeast bound	6	3	2	5	2	18	37.5%
Direction not Stated	0	0	0	3	1	4	8.3%
<b>ADT &amp; CRASH RATES</b>							<b>Yearly Avg</b>
ADT	5525	5467	4800	4170	6300	n/a	5252
Actual Crash Rate	.829	.587	.680	.855	.509	n/a	.692
Critical Crash Rate	1.03	1.09	1.12	1.11	.996	n/a	n/a
A/C Ratio	.805	.541	.604	.768	.511	n/a	n/a
<b>CRASHES BY HARMFUL EVENT</b>							<b>Percent of 5 year Total Crashes</b>
Rear End	1	3	0	1	1	6	12.5%
Head On	3	1	0	0	1	5	10.4%
Angle	5	3	5	3	3	19	39.6%
Left Turn	0	0	0	0	1	1	2.1%
Right Turn	0	0	0	0	0	0	0%
Sideswipe	0	0	0	0	0	0	0%
Backed Into	0	0	0	0	0	0	0%
Parked Car	0	0	0	0	0	0	0%
MV Other Road	0	0	0	0	0	0	0%
Pedestrian	0	0	0	0	0	0	0%
Bicycle	0	0	0	0	0	0	0%
Moped	0	0	0	0	0	0	0%
Train	0	0	0	0	0	0	0%
Animal	0	1	0	1	0	2	4.2%
Sign	2	0	0	0	1	3	6.3%
Utility Pole	0	0	0	1	0	1	2.1%
Guardrail	0	0	0	0	0	0	0%
Fence	0	0	0	0	0	0	0%
Bridge/Barrier Wall	0	0	0	0	0	0	0%
Tree/Shrub	0	0	0	1	0	1	2.1%
Const Barricade/Sign	0	0	0	0	0	0	0%
Traffic Gate	0	0	0	0	0	0	0%
Attenuator	0	0	0	0	0	0	0%
Other Fixed Object	0	0	1	0	0	1	2.1%
Ran Into Ditch	0	1	0	1	1	3	6.3%
Ran Off Road	0	0	0	0	0	0	0%

**PRELIMINARY ENGINEERING REPORT  
COBB ROAD (CR 485) / US 98 PD&E STUDY**

Overtuned	1	0	2	1	1	5	10.4%
All Others	0	0	0	1	0	1	2.1%
Total of Overtuned and All Run Off Road Types	1	1	2	3	2	9	18.8%

**CRASH COST ANALYSIS**

	YEAR	ECONOMIC LOSS
	1995	\$2,493,400
	1996	\$1,970,100
	1997	\$1,684,500
	1998	\$2,189,000
	1999	\$1,903,400
	AVERAGE CRASH \$ LOST PER YEAR	\$2,048,080
	AVERAGE COST PER CRASH	\$213,300

By far, the highest frequency of crashes during the five-year period was by influence of an intersection (64.6%). Further review found the highest concentrations of crashes to be at the Lake Lindsey Road (CR 476) and Brittle Road (CR 491A) intersections, at the two most significant curves in the study section. Drivers whose residence was outside of Hernando County were represented disproportionately compared to local drivers (65% to 35%). This suggests that local drivers may be more aware of problem areas and adjust their driving accordingly while more out-of-town drivers are unfamiliar with, for example, the two intersections located on curves. More crashes occurred northwest bound (54.2%) than southeast bound (37.5%), although directions for 8.3% of crashes were not reported. Angle crashes are clearly the most predominant crash types with 39.6% of all crashes. This statistic is consistent with the crash concentration at the two unsignalized intersections.

The actual / critical (A/C) crash rate ratio compares actual crash rates (number of crashes per million vehicle miles) with critical crash rates (statewide average of actual crash rates for similar highway types and volumes) in order to help determine the significance of crash rates. The A/C crash rate ratio for this section of US 98 has remained consistently below one. This indicates that the section of highway has a crash rate somewhat below the statewide average for similar highway types and volumes.



Comparison of **Tables 4.2** and **4.3** shows major differences in economic losses. This is due to the fact that the two crash reporting systems calculated economic loss very differently. The state system is based on statewide averages for types of crashes (PDO, injury and fatalities) including medical and other societal costs whereas the CARS 2000 system lists only the vehicle damage estimates included in the crash report completed by law enforcement.

#### **4.1.10 Intersections and Signalization**

There are two (2) signalized intersections along the project corridor: Cobb Road at SR 50 and the Cobb Road/US 98 intersection. The existing lane geometry of each of these signalized intersections is illustrated schematically in the *Traffic Report*<sup>6</sup> (April 2003) and in **Section 6.0** of this document.

#### **4.1.11 Railroad Crossing**

There are two at-grade CSX railroad crossings within the project limits: one on Cobb Road and one on US 98.

The Cobb Road rail crossing is located approximately 700 ft. north of the Yontz Road intersection. This crossing was reconstructed in 2001. A spur line into the Florida Crushed Stone mining facility branches off the main tracks with a switch immediately to the west of Cobb Road. This spur line has a 6° curve with no spirals. This crossing has operating flashing red signals with no gates.

The rail line crossing on US 98 (#624880-G) is located at MP 5.798, approximately 900 ft. south of Lake Lindsey Road. This crossing is currently posted as a rough crossing. Flashing red signals with no gates are employed at this location. This rail line is a siding that services the Florida Rock Industries, Brooksville Quarry. This line is not currently utilized by the quarry; however, a permit to construct a concrete plant at this site is currently under review. If this plant is permitted, this spur line will be utilized again.

#### 4.1.12 Posted Speed

The posted speed for Cobb Road within the limits of the project is 55 mph. Exceptions include the segment approaching Yontz Road, which is posted at 45 mph, and the segments approaching Fort Dade Avenue and SR 50, which are posted at 35 mph.

The posted speed for US 98 within the limits of the project is 60 mph, with the exception of the segment approaching the Suncoast Parkway, which is posted at 45 mph.

#### 4.1.13 Operating Speed

A vehicle spot speed study was conducted on August 26, 2002 in order to determine 85<sup>th</sup> percentile operating speeds at six locations along the project corridor. **Table 4.4** presents the details and results of this study.

**Table 4.4 Vehicle Spot Speed Study Details and Results**

Location	Segment	85 <sup>th</sup> PERCENTILE SPEEDS (mph)		
		SB Volume	NB Volume	Volume Both Directions
Cobb Road at Old Cobb Road	1a	52	54	53
Cobb Road, ~2000 ft. south of Yontz Road	1b	55	58	56
Cobb Road, ~1300 ft. south of Youth Drive	2a	56	58	57
Cobb Road, ~4200 ft. south of US 98	2a	61	61	61
US 98, ~3700 ft. south of CR 491	3	65	63	64
US 98, ~4100 ft. south of World Woods	4	63	67	65

#### 4.1.14 Street Lighting

Existing lighting along Cobb Road and US 98 within the limits of the study area is limited to each end of the project and the intersection at Yontz Road. Lighting on Cobb Road in the vicinity of SR 50 includes four conventional fixtures along the east side of

the roadway. This lighting begins at SR 50 and extends approximately 400 ft. to the north.

Four lighting fixtures are in place at the Yontz Road intersection, one in each quadrant of the intersection. These fixtures are mounted on utility poles and resemble dusk-to-dawn lighting. This lighting is likely provided by the adjacent cement plant.

Lighting on US 98 in the vicinity of the Suncoast Parkway includes conventional fixtures on both sides of the roadway. This lighting extends to the termination of the acceleration lane from the Suncoast Parkway exit ramp.

#### **4.1.15 Major Utilities**

A *Utility Assessment Package*<sup>7</sup> has been prepared as part of this PD&E Study, which describes the type and location of existing utilities along the corridor. The findings of the *Utility Assessment Package*<sup>7</sup> are incorporated by reference into this *PER*.

A field review in October 2001, as well as responses from the City of Brooksville, Bell South Communications, Williams Communications, Florida Power Corporation and Time Warner Cable, revealed some existing utilities, which are shown in **Exhibit 4.6**. FDOT's utility review also indicated Withlacoochee River Electric Cooperative utilities within the limits of the project; however, a response verifying the location of these utilities was not received.

#### **4.1.16 Pavement Conditions**

A site visit conducted in October 2001 found deterioration and surface roughness of the existing pavement on Cobb Road and US 98. At the time this report was written, construction plans have been developed for resurfacing of the existing US 98. These plans were let for construction in 2002.

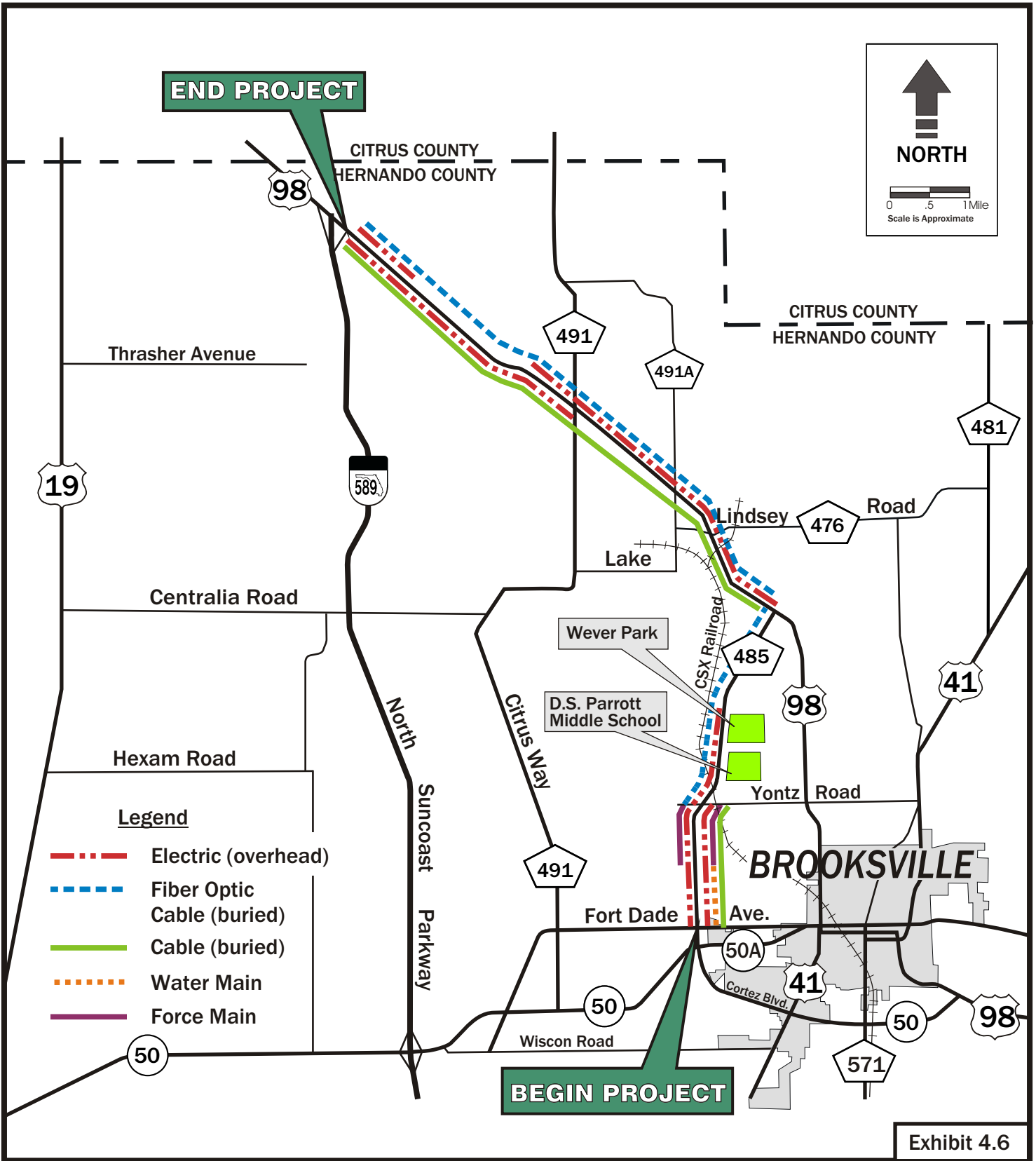
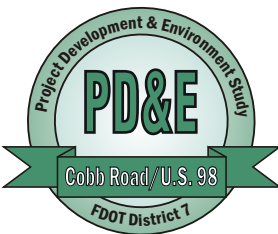


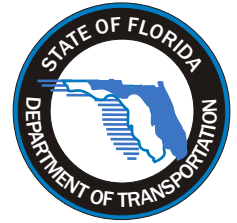
Exhibit 4.6



# Existing Utilities

## Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1  
FAP Nos: 2891 007 P & 2891 008 P



## 4.2 EXISTING BRIDGES

No bridges exist on Cobb Road or US 98 within the limits of the study area.

## 4.3 ENVIRONMENTAL CHARACTERISTICS

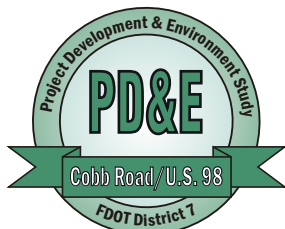
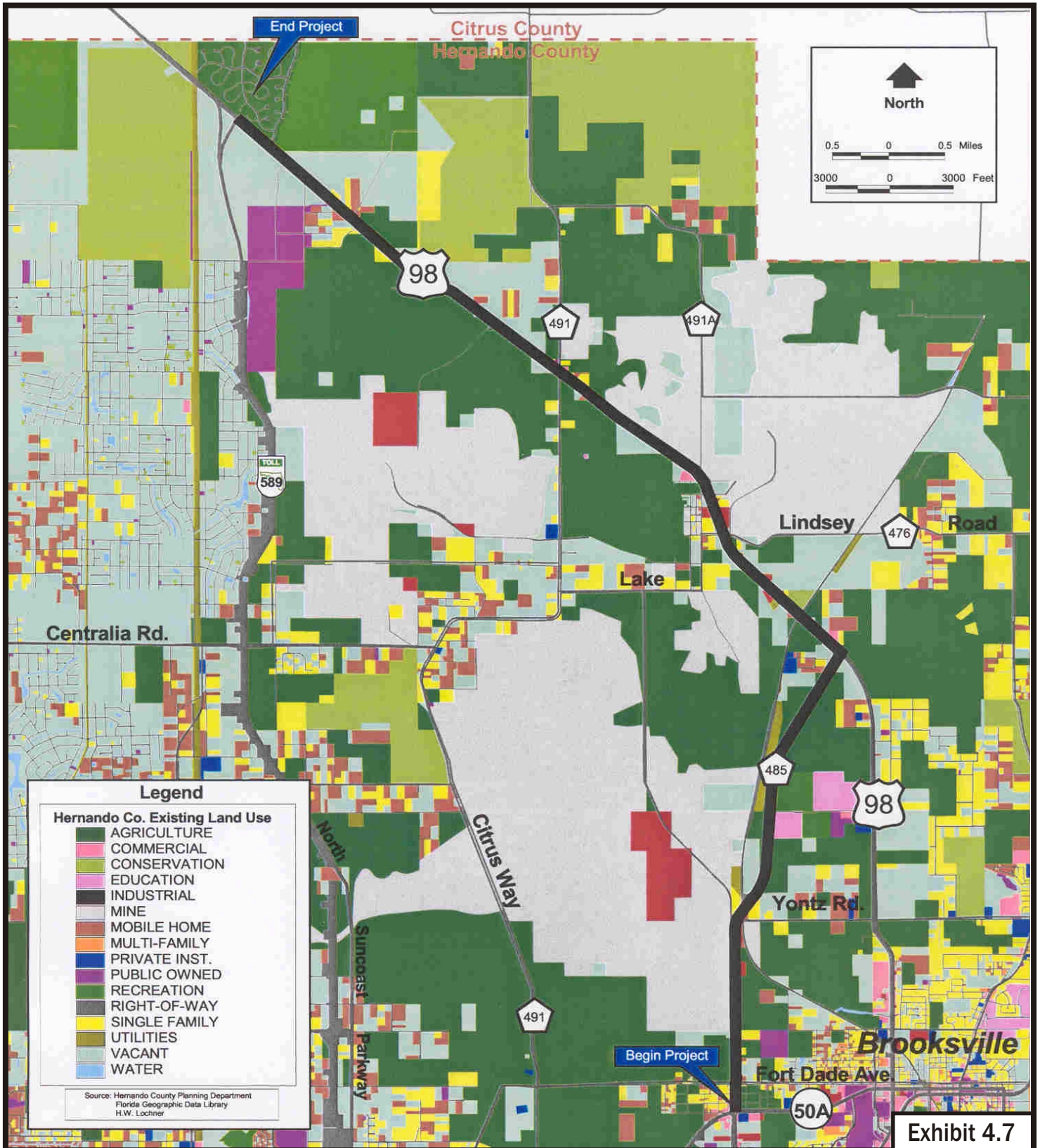
### 4.3.1 Land Use Data

#### 4.3.1.1 Existing Land Use

The Hernando County Planning Department's existing land use map is presented in **Exhibit 4.7**. The predominant existing land uses in the study area are agricultural and mining. Agricultural designations are representative of large hay fields and active cattle pastures. Mining designations are representative of three major mining facilities located along the project corridor, including Florida Mining & Materials Corporation, Florida Crushed Stone Company and Florida Rock Industries, Inc. Industrial land uses also exist along the project corridor, representing several notable facilities, including Flagstone Pavers, Ewell Industries and Florida Concrete and Stone. Some scattered single-family residential and commercial uses are situated along the corridor, particularly in the southern portion. Vacant lands are also found along the project corridor. Recreational land uses include the Ernie Wever Youth Park (Wever Park) adjacent to the D.S. Parrott Middle School and the private World Woods Golf Course at the northern end of the project. Lands associated with the Annettliga Hammock Conservation and Recreation Lands (CARL) on the north side of US 98 are designated as conservation lands in the County's land use mapping.

#### 4.3.1.2 Future Land Use

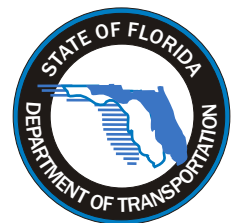
The Hernando County Comprehensive Plan's future land use map is presented in **Exhibit 4.8**. The study area immediately adjacent to the Cobb Road segment of the project



# Existing Land Use

## Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1  
FAP Nos: 2891 007 P & 2891 008 P



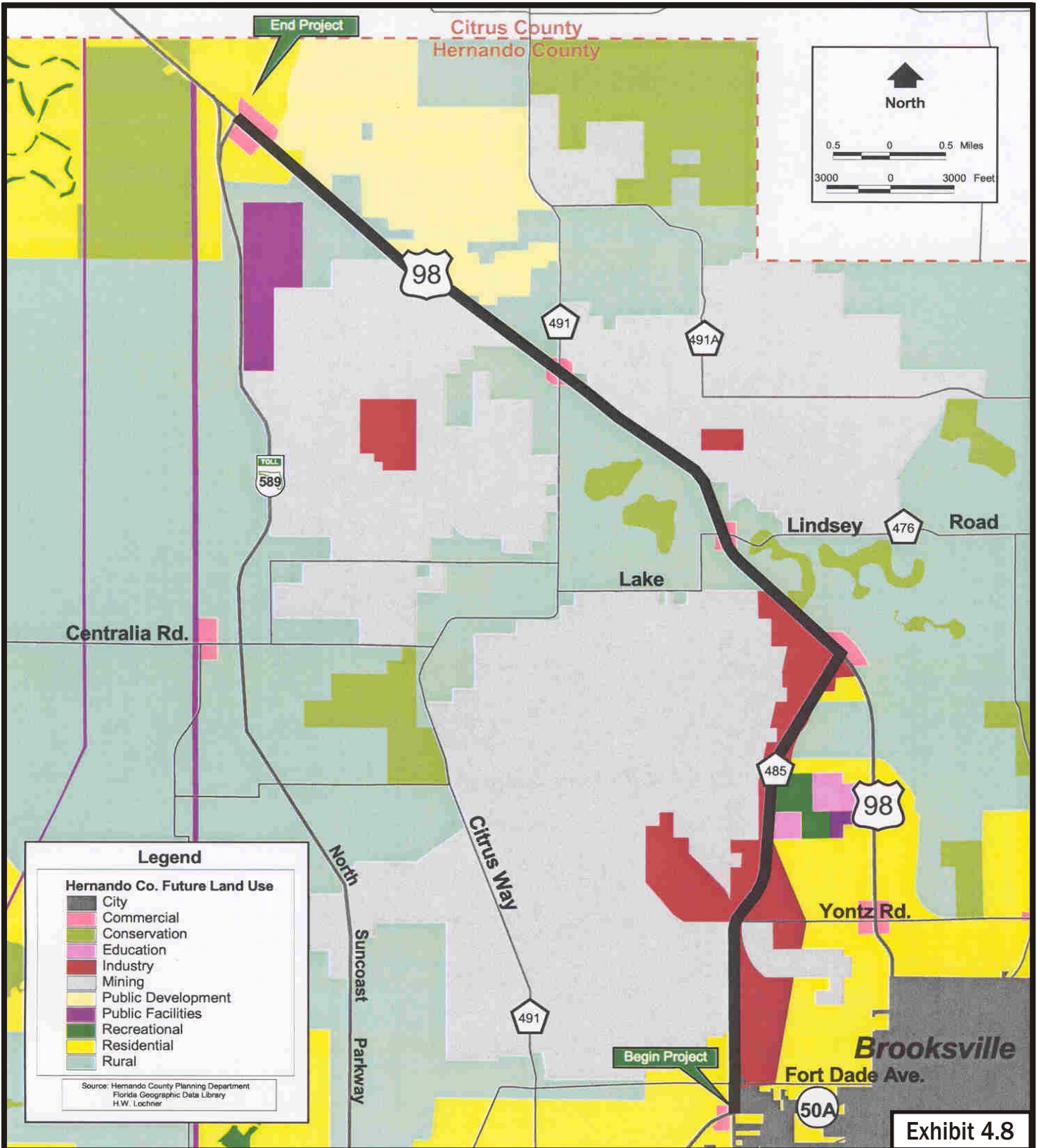
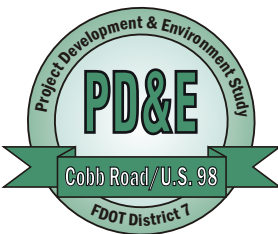


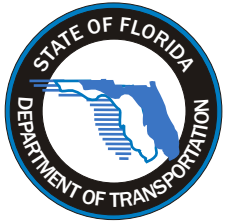
Exhibit 4.8



# Future Land Use

## Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1  
 FAP Nos: 2891 007 P & 2891 008 P



corridor is anticipated to undergo a developing transition towards industrial and residential land uses. This transition is underway with the plot approvals of a proposed industrial park just south of the D.S. Parrott Middle School. The majority of the study area along US 98 will remain as mining and rural land uses in the future, with commercial nodes at Lake Lindsay Road (CR 476), Citrus Way (CR 491), and the Suncoast Parkway. Residential land use is also anticipated near the Suncoast Parkway.

#### **4.3.2 Cultural Features and Community Services**

The planned project would not dislocate, alter, or impede the provision of any community service. On the contrary, the improvement in traffic capacity and increases in traffic efficiency would likely enhance the ability of certain community services to be provided (e.g., emergency services and access to educational and recreational opportunities). Particularly, the capacity improvements will provide a more efficient route for trucks to bypass the City of Brooksville, which would alleviate disturbances in the downtown area associated with heavy industrial traffic. The Hernando County Comprehensive Plan outlines Cobb Road as a future evacuation route, as well. These capacity improvements will make that designation both feasible and efficient.

The planned project would not split or isolate any residential areas. Furthermore, the project would not impede or otherwise alter existing or planned modes or patterns of social interaction. No churches, cemeteries, fire stations or medical facilities are located along the project. One school (D.S. Parrott Middle School) is situated on the east side of Cobb Road; however, this school would not be adversely impacted by proposed improvements. As a result, the planned project is not expected to have any adverse effects on community cohesion.

##### **4.3.2.1 Section 4(f) Lands**

Section 4(f) of the Department of Transportation Act of 1966, as amended, requires that transportation facilities avoid the use of public parks, wildlife refuges, or historic sites



unless it can be proven that there is no prudent or feasible alternative to such use. There are four potential Section 4(f) properties along the planned project: 1) Wever Park, 2) a historic school/cannery (FMSF No. 8HE447), 3) a parcel of the Annutteliga Hammock (a state-owned CARL purchase) located west of CR 491, and 4) another parcel within the Annutteliga Hammock located south of Lake Lindsey Road. **Exhibit 4.9** presents potential Section 4(f) lands along the project corridor.

#### 4.3.2.2 Historic Sites/Districts

A *Cultural Resources Assessment Survey*<sup>8</sup> (CRAS) has been prepared as part of this PD&E Study. The findings of the CRAS are incorporated by reference into this PER.

#### 4.3.2.3 Archaeological Sites

A *Cultural Resources Assessment Survey*<sup>8</sup> (CRAS) has been prepared as part of this PD&E Study. The findings of the CRAS are incorporated by reference into this PER.

#### 4.3.2.4 Recreation Areas

Public parks and recreation areas within the study area include: Ernie Wever Youth Park (Wever Park) and the Annutteliga Hammock Conservation and Recreation Lands (CARL) sites. Wever Park is a 113-acre park located on the east side of Cobb Road approximately halfway between Yontz Road and US 98. Wever Park includes baseball and multipurpose fields, picnic shelters, a playground and a recreation building. There is no direct access to Wever Park from Cobb Road.

The Annutteliga Hammock CARL site is a large area covering approximately 30,000 acres in Hernando and Citrus counties. Some parcels of the envisioned Annutteliga Hammock site have not yet been acquired. A large portion of Cobb Road, north of Yontz

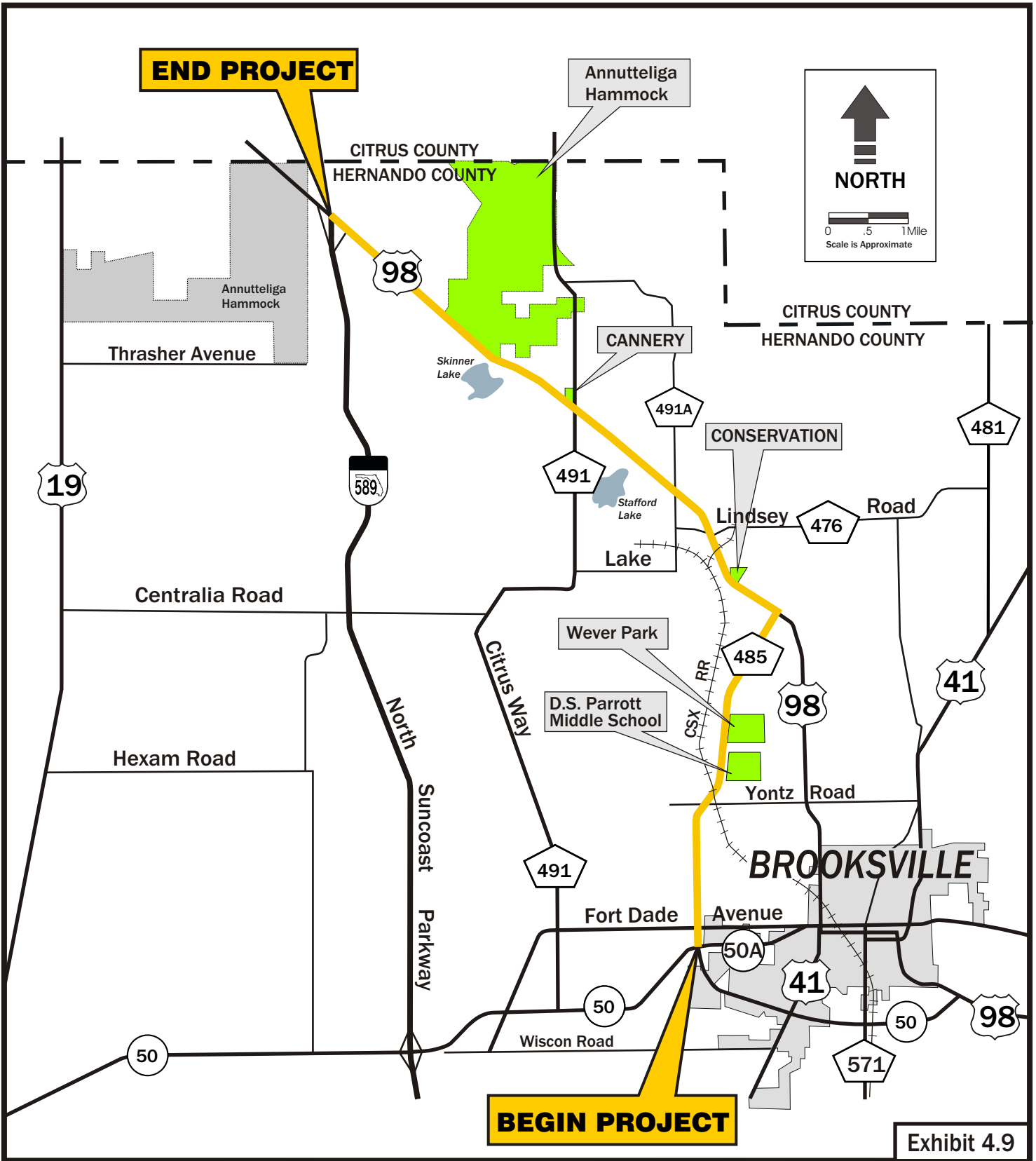
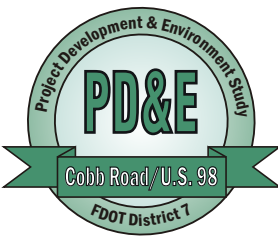


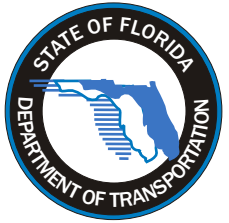
Exhibit 4.9



# Potential Section 4(f) Lands

Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1  
 FAP Nos: 2891 007 P & 2891 008 P



Road, either runs through or abuts the delineated site. A segment of US 98, northwest of Citrus Way and just over 2 miles in length, is adjacent to an acquired parcel of the Annutteliga Hammock site to the north. This site is designated for use as a state forest and wildlife management area.

### **4.3.3 Natural and Biological Features**

#### **4.3.3.1 Wetlands**

A *Wetland Evaluation Report*<sup>9</sup> (*WER*) has been prepared as part of this PD&E Study. The findings of the *WER* are incorporated by reference into this *PER*.

#### **4.3.3.2 Floodplains**

A *Location Hydraulic Report*<sup>4</sup> (*LHR*) has been prepared as part of this PD&E Study. The findings of the *LHR* are incorporated by reference into this *PER*.

#### **4.3.3.3 Threatened and Endangered Species**

A *Threatened and Endangered Species Biological Assessment*<sup>10</sup> (*TESBA*) has been prepared as part of this PD&E Study. The findings of the *TESBA* are incorporated by reference into this *PER*.

### **4.3.4 Potential Contamination Sites**

A *Contamination Screening Evaluation Report*<sup>11</sup> (*CSER*) has been prepared for this PD&E Study. The findings of the *CSER* are incorporated by reference into this *PER*.

Nine potential contamination sites have been identified within the project study area and are shown on the Recommended Alternative Design Concept in **Appendix B**.

#### 4.3.5 Farmlands

Through coordination with the National Resources Conservation Service (NRCS), it has been determined that there is no involvement with farmlands in the project vicinity.

#### 4.4 REFERENCES

1. *Hernando County Comprehensive Plan*; Hernando County Board of County Commissioners; Adopted June 1989 and as amended.
2. *Straight Line Diagrams*; Florida Department of Transportation, District 7.
3. *Soil Survey of Hernando County*; Soil Conservation Service.
4. *Location Hydraulics Report (LHR)*; H.W. Lochner, Inc.; April 2003.
5. *Preliminary Geotechnical Report*; Williams Earth Sciences; April 2002.
6. *Traffic Report*; H.W. Lochner, Inc.; April 2003.
7. *Utilities Assessment Package*; FDOT District 7.
8. *Cultural Resources Assessment Survey (CRAS)*; Archaeological Consultants, Inc.; April 2003.
9. *Wetlands Evaluation Report (WER)*; H.W. Lochner, Inc.; April 2003.
10. *Threatened and Endangered Species Biological Assessment (TESBA)*; H.W. Lochner, Inc.; April 2003.
11. *Contamination Screening Evaluation Report (CSER)*; Quest Ecology; April 2003.

## 5.0 DESIGN CRITERIA

Proposed roadway improvements will be developed to fulfill the objective of accommodating the increasing traffic volumes projected for the 20-year design life of Cobb Road and US 98, as well as appropriate pedestrian and bicycle facilities, in a safe and efficient manner. The typical sections which are developed shall be in accordance with specific FDOT design standards and criteria. The FDOT's most current *Plans Preparation Manual – English (PPM<sup>1</sup>)*, AASHTO's *A Policy on Geometric Design of Highways and Streets* (also known as the “*Green Book*”<sup>2</sup>), and other references such as *Straight Line Diagrams (SLD<sup>3</sup>)* and the *Traffic Report* (April 2003) were used as the references for development of the design criteria to be applied to the proposed typical sections for this project. **Table 5.1** presents the pertinent design criteria used for this effort and contains the required standards for the urban, suburban, rural and save-the-pavement typical sections being proposed.

### 5.1 FUNCTIONAL CLASSIFICATION

The functional classification of the roadway affects important elements of design such as the desired operational characteristics, design speed, Level of Service (LOS) requirements, and access management provisions. According to the SLD<sup>3</sup>, US 98 is currently classified as a rural arterial. The *Hernando County Comprehensive Plan<sup>4</sup>* – Traffic Circulation Element indicates that Cobb Road is currently classified as a collector. Upon re-designation of Cobb Road as US 98, this road will be classified as a rural arterial.

### 5.2 DESIGN SPEED

The design speed affects a number of design elements such as horizontal and vertical geometry, sight distance, superelevation, and a variety of typical section dimensions (clear zone, border, shoulder width, median width, etc.). The design speed for each roadway segment will be selected logically with respect to conditions such as

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**Table 5.1 Design Criteria**

<b>DESIGN ELEMENT</b>	<b>Urban Alternative</b>	<b>Suburban and Suburban Save Pav't Alternatives</b>	<b>Rural and Rural Save Pav't Alternatives</b>
<u>Existing Functional Classification</u>	Rural Minor Arterial	Rural Minor Arterial	Rural Minor Arterial
<u>Design Classification</u>	Urban Arterial	Suburban Arterial	Rural Arterial
<u>Design Speed</u>	45 mph	55 mph	70 mph
<u>Lane Widths</u>			
-Travel	12'	12'	12'
-Turning	12'	12'	12'
<u>Shoulder Widths</u>			
-Outside	N/A	8' (5' paved)	8' (5' paved)
-Inside	N/A	4' curb offset	6' *1
<u>Shared Use Path Width</u>	12'	12'	12'
<u>Sidewalk Width</u>	5' (6' if adjacent to curb)	5'	N/A
<u>Cross Slopes</u>			
-Travel Lanes	2%	2%	2%
-Right Shoulder	N/A	6%	6%
-Left Shoulder	N/A	2%	5%
-Max rollover between travel lanes	4%	4%	4%
<u>Median Width</u>	22' *2	30'	40'
<u>Border Width</u>	14' *3	35'	40'
<u>Clear Zone/Horizontal Clearance</u>	4' from face of curb	30'	36'
<u>Vertical Clearance</u>			
-Overhead Signs	17' 6"	17' 6"	17' 6"
-Signals	17' 6"	17' 6"	17' 6"
<u>Maximum Grades (Rolling Terrain)</u>	7%	5.5%	4%
-max change w/o vertical curves	0.70%	0.50%	0.20%
<u>Minimum Stopping Sight Distance</u>	350'	475'	700'
<u>Vertical Alignment</u>			
-Crest min K	90	170	370
-Sag min K	80	110	170
-Min crest curve length	135'	350'	500'
-Min sag curve length	135'	250'	400'
<u>Horizontal Alignment</u>			
-Max Curvature	8° 15'	2° 5' *4	3° 30'
-Max Superelevation	0.05 ft/ft	0.05 ft/ft	0.10 ft/ft *5
-Max Def. w/o curve	1°	0° 45'	0° 45'
-Length of curve	675' (400' min)	825' (400' min)	1050' (400' min)

\*1 Proposed inside shoulders are 6 ft. with 4 ft. paved

\*2 Proposed median width of 17.5 ft. will require a variation.

\*3 Proposed minimum border width of 11 ft. will require a variation.

\*4 Curve at Yontz Road will require a variation for maximum horizontal curvature.

\*5 Existing RR crossing at MP 5.8 on US 98 will require a variation on superelevation rate for the 2° curve.

topography, adjacent land use and development character, and the functional classification of the highway.

As indicated in the AASHTO “*Green Book*,”<sup>2</sup> the design speed control applies to a lesser degree on arterial roadways than on other types of facilities such as rural highways, since the higher free-flow speeds for several peak hours a day on arterial streets are limited or regulated to that which the recurring peak volumes can handle. Speeds along these arterial roadways are governed by the presence of other vehicles traveling in groups (“platoons”) both in and across the through traffic lanes. The speeds are also governed by traffic devices (such as signals) and their spacing, in addition to the physical roadway characteristics. During periods of low to moderate traffic volumes, vehicular running speeds are higher, but remain governed by such factors as posted speed limits, intersection and median friction, mid-block friction related to the density of driveway connections, and the presence of law enforcement.

The Cobb Road corridor is generally transitioning from urban to rural in Segments 1a and 1b, with a mix of residential, commercial, and industrial uses interspersed from north of SR 50 to Yontz Road. There is a substantial amount of vacant land available for future development and possible subdivision, particularly on the east side of the roadway.

Cobb Road from Yontz Road to US 98 (Segments 2a and 2b), is rural in development character, with very little development presently adjacent to the existing roadway right-of-way.

US 98 from Cobb Road to CR 491 (Segment 3) and from CR 491 to Suncoast Parkway (Segment 4), is also rural in nature with a very limited amount of frontage commercial development, and several unpaved and paved cross-roads and driveways.

The projected traffic volumes in the *Traffic Report* (April 2003), combined with the safety concerns related to high truck volumes (33.5% per day), suggests a need for a four-lane facility along Cobb Road and US 98. It is anticipated that the increasing traffic

volumes and anticipated future development based on the *Hernando County Comprehensive Plan*<sup>4</sup> – Land Use Element, particularly on Cobb Road from north of SR 50 to Yontz Road, will serve to urbanize Segments 1a and 1b and also influence the lowering of operating speeds. Segment 2 on Cobb Road and Segments 3 and 4 on US 98 are anticipated to retain a rural development character through the design life of the project.

The existing posted speed limit on Cobb Road is 35 mph in the widened area north of SR 50 to Fort Dade Avenue, and 55 mph for the balance of the project limits to US 98 except in the area of the Yontz Road intersection, where the posted speed is 45 mph. The US 98 posted speed limit from Cobb Road to Suncoast Parkway is 60 mph, except near the approach to the Suncoast Parkway interchange, where it is reduced to 45 mph. Field observations indicate that the posted speeds appear to be set appropriately for the current roadway geometrics and corridor development conditions. A speed study was conducted on August 26, 2002 (see **Section 4.1.13**).

Based on an overall assessment of the above information, a design speed of 45 mph (Urban) / 55 mph (Suburban) has been selected for Segments 1a and 1b for Cobb Road, and a design speed of 70 mph has been selected for the rural development character anticipated to continue in Segments 2a and 2b (Cobb Road) and Segments 3 and 4 (US 98).

### **5.3 LANE WIDTHS**

According to the FDOT *PPM*<sup>1</sup>, Table 2.1.1, urban, suburban and rural arterial through or travel lanes are to have a standard width of 12 ft. On rural arterials, 11-ft. lanes are permitted under several conditions on roadways such as US 98 and Cobb Road, which are not part of the Florida Intrastate Highway System (FIHS) network. Twelve-ft. lanes have been selected for this project.



#### 5.4 SHARED USE PATH WIDTH

Shared use paths are an important element for consideration during the highway design process and are discussed in Section 8.6 of the FDOT *PPM*<sup>1</sup>. Shared use paths are used by pedestrians, joggers, in-line skaters, bicyclists and equestrians and are designated to be exclusive of motorists. According to Section 8.6.2 of the FDOT *PPM*<sup>1</sup>, the minimum width for a two-way shared use path is 12 ft. Due to the safety factors associated with heavy truck volumes along this corridor, a shared use path was chosen as the preferred facility for bicyclists and pedestrians. Furthermore, implementation of a designated bike trail along Cobb Road and US 98 is identified in the Hernando County MPO 2025 *L RTP* with connections to shared use paths along SR 50 and the Suncoast Parkway.

#### 5.5 MEDIAN WIDTHS

According to the FDOT *PPM*<sup>1</sup>, Table 2.2.1, the standard median width for urban arterial roadways with a design speed less than or equal to 45 mph is 22 ft. A median width of 17.5 ft. was selected for this project in order to fit the urban typical section within the existing right-of-way. A variation will be required for this 17.5-ft. median width. The standard median width for suburban arterial roadways with a design speed greater than 45 mph is 30 ft. The selected suburban typical section meets this criteria, utilizing a 22-ft. curbed median with 4-ft. curb offsets. The standard median width for rural arterial roadways with a design speed greater than 45 mph is 40 ft. A 40-ft. median was selected for the rural typical section for this project.

#### 5.6 SHOULDER WIDTHS

The FDOT *PPM*<sup>1</sup> indicates that the standard outside shoulder width for a divided arterial highway without shoulder gutter varies from 8 to 12 ft. depending on the projected design year traffic volumes. The *Traffic Report* (April 2003) forecasts that year 2025 traffic volumes will be in the “low” range for this facility. An outside shoulder width of 8 ft. (5

ft. paved) and an inside shoulder width of 6 ft. (4 ft. paved) have been selected for the rural typical section.

## **5.7 SIDEWALK WIDTH**

Section 8.3.1 of the FDOT *PPM*<sup>1</sup> states that the standard sidewalk width is 5 ft. when separated from the curb by a buffer strip two or more feet wide. A 6-ft. sidewalk was selected for the urban typical section for this project since the existing right-of-way constraints did not allow for a buffer strip.

## **5.8 BORDER WIDTHS**

The standard border widths for arterial highways with curb and gutter are listed in Table 2.5.2 of the FDOT *PPM*<sup>1</sup>. The standard border width is 14 ft. for an urban arterial with a design speed of 45 mph or greater when travel lanes are located at the curb. The selected minimum border width for the non-expandable (fit within existing right-of-way) urban typical section is 11 ft. A variation will be required for this 11-ft. border width. Table 2.5.1 indicates that the standard border (distance from the shoulder point to the right-of-way line) for a rural arterial with design speed > 45 mph with flush shoulders is 40 ft. The FDOT Suburban Typical Section Task Force has recommended a minimum border width of 35 ft.

## 5.9 REFERENCES

1. *Plans Preparation Manual (English)*; Florida Department of Transportation, Tallahassee, Florida; January 2000 and as amended.
2. *AASHTO – A Policy on Geometric Design of Highways and Streets*; American Association of State Highway and Transportation Officials; 2001.
3. *Straight Line Diagrams*; Florida Department of Transportation, District 7.
4. *Hernando County Comprehensive Plan*; Hernando County Board of County Commissioners; Adopted June 1989 and as amended.

## 6.0 TRAFFIC

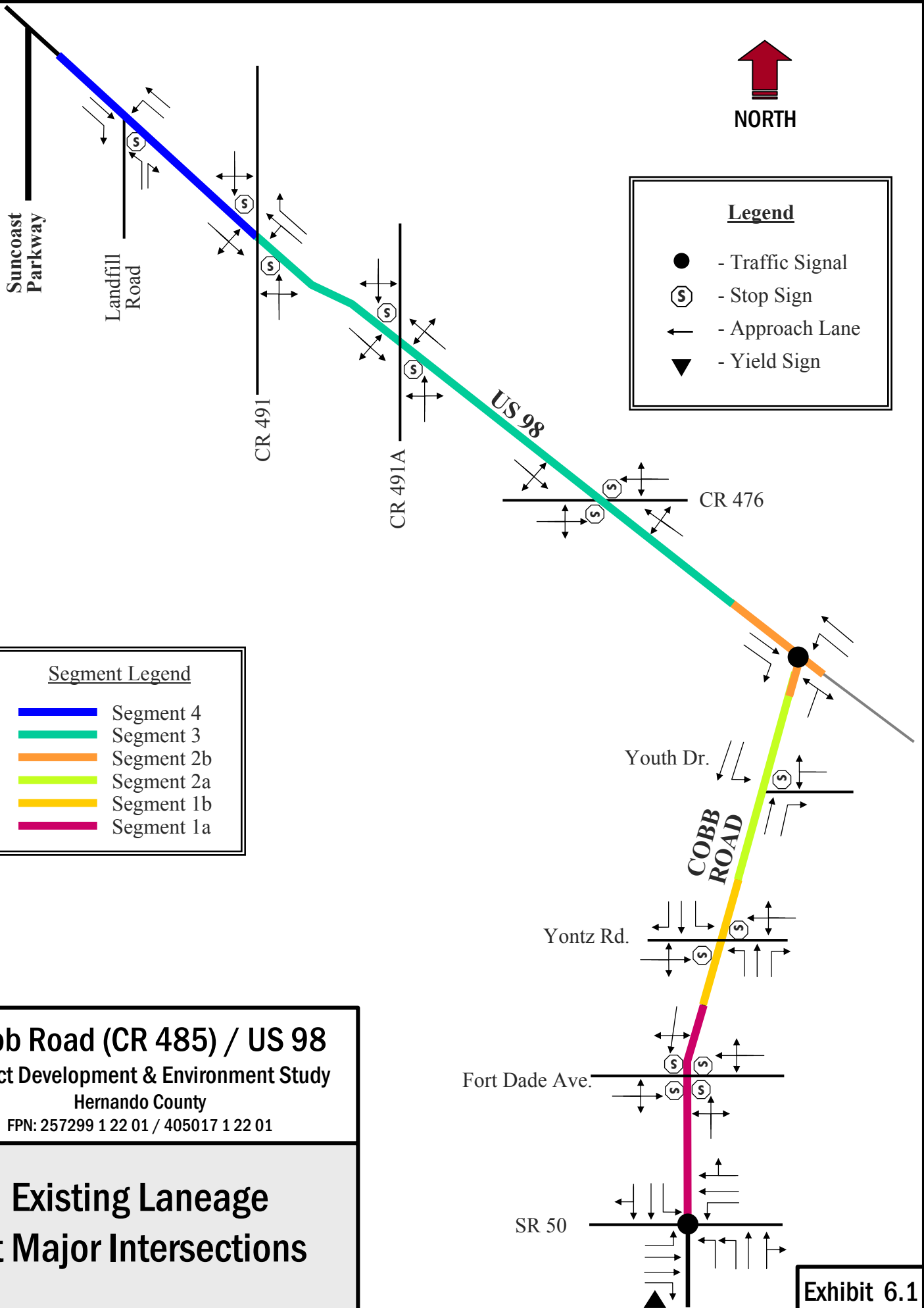
This section represents a summary of the *Traffic Report* which was prepared for this PD&E Study by H.W. Lochner, Inc. (April 2003). This report includes a summary of travel demand model validation, existing and future annual average daily traffic (AADT) volume development, and future design hour volume development in the study location. The traffic study analyzed existing conditions, as well as Build and No-Build Alternatives. The Build Alternative involves improvements to the existing two-lane rural facilities to a continuous 4-lane divided facility.

### 6.1 EXISTING ROADWAY NETWORK

Cobb Road currently is a two-lane undivided rural minor arterial from SR 50 in the City of Brooksville to US 98. The existing US 98 is a two-lane undivided rural minor arterial from Cobb Road to the Suncoast Parkway. In concert with SR 50 south of Brooksville, the Cobb Road / US 98 corridor serves as a major bypass around the City of Brooksville in Hernando County. This route is particularly essential for truck traffic associated with several quarries that are situated along the corridor. The existing laneage and type of traffic control at major study area intersections are shown in **Exhibit 6.1**.

### 6.2 MULTIMODAL TRANSPORTATION SYSTEM CONSIDERATIONS

Review of available data indicated that no regularly scheduled public transit service currently exists within the project corridor. The Hernando County MPO 2025 Cost Affordable Plan proposes only limited transit service in the Brooksville area and does not include any transit service along the Cobb Road and US 98 corridor. Local bus service is proposed along US 98 between SR 50 in downtown Brooksville and the area of the existing US 98 and Cobb Road intersection.



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**Existing Laneage  
 at Major Intersections**

**Exhibit 6.1**

One Class 1 freight rail line crosses Cobb Road north of Yontz Road. This freight line provides major hauling service between the quarries in this part of the state and the statewide lines emanating out of the Tampa Bay area. An additional rail line crosses US 98, although it is not in use at this time. The Hernando County Airport is located along US 41, approximately 6.4 miles south of the southern end of the project.

### **6.3 TRAFFIC ANALYSIS ASSUMPTIONS**

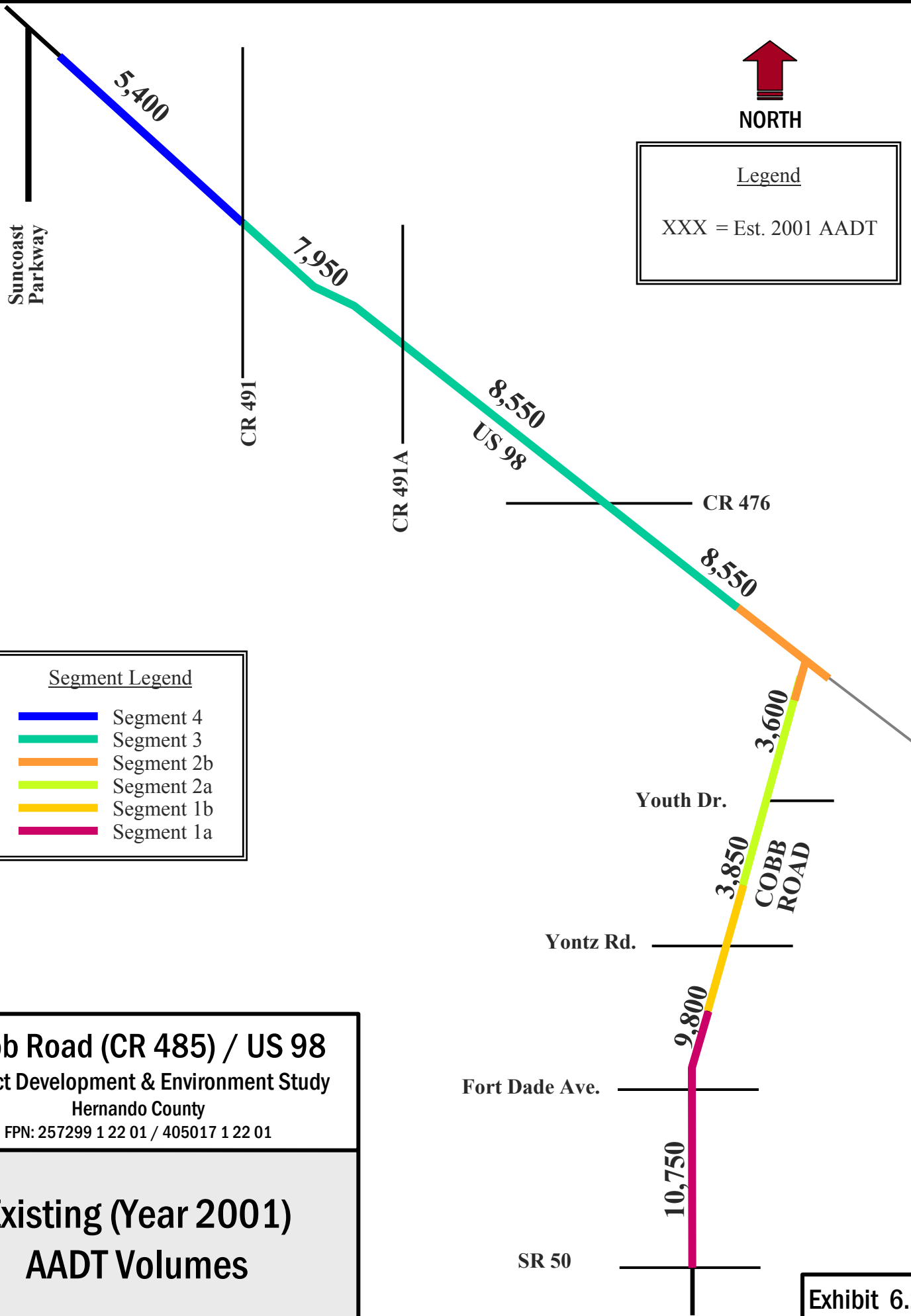
Traffic analysis assumptions and parameters are based on data collected in the region during the preparation of the *Traffic Report* (April 2003). That report recommended the following traffic parameters:

K <sub>30</sub> factor	=	9.9 %
D factor	=	54 %
T factor	=	16.75 %
PHF factor	=	0.90

### **6.4 EXISTING TRAFFIC VOLUMES**

AADT volumes were determined by using count data taken in June 2001, which was seasonally adjusted as well as axle adjusted. Approach counts taken at adjacent intersections were added to estimate 2-way link volumes. Existing (Year 2001) AADT volumes are shown in **Exhibit 6.2**. The existing (Year 2001) design hour two-way volumes are shown in **Exhibit 6.3**.

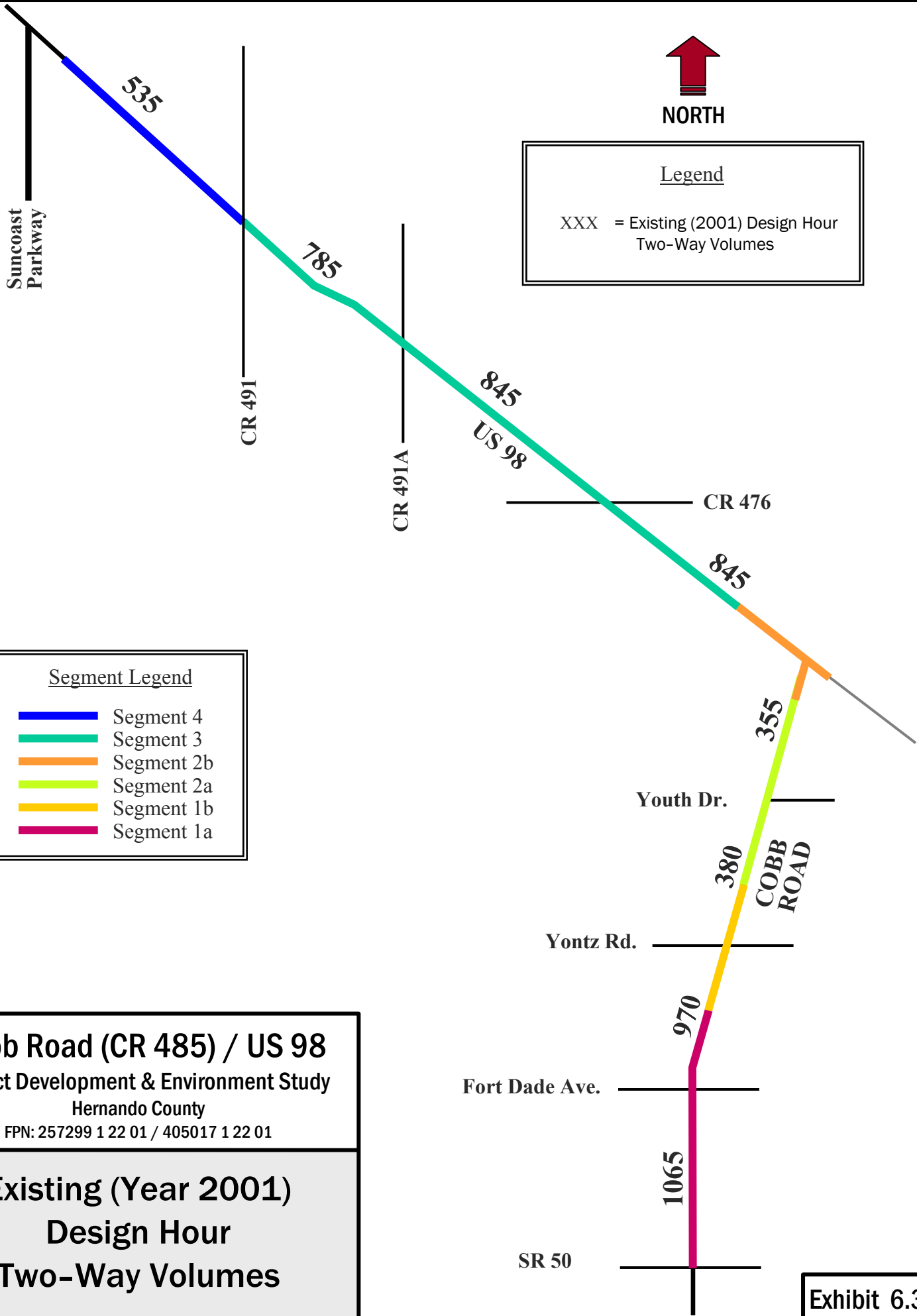
Of particular importance in any discussion of existing traffic is the extraordinarily high percentage of trucks traveling within the study corridor. Truck data was collected as part of the overall data collection process. Twenty-four hour truck percentages were typically in the order of 30% on most of the links during the AM and PM peak hours, with the section of Cobb Road immediately south of US 98 at well over 40%. These percentages are consistent with truck percentages reported at area FDOT count stations.



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**Existing (Year 2001)**  
**AADT Volumes**

**Exhibit 6.2**



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**Existing (Year 2001)  
 Design Hour  
 Two-Way Volumes**

**Exhibit 6.3**



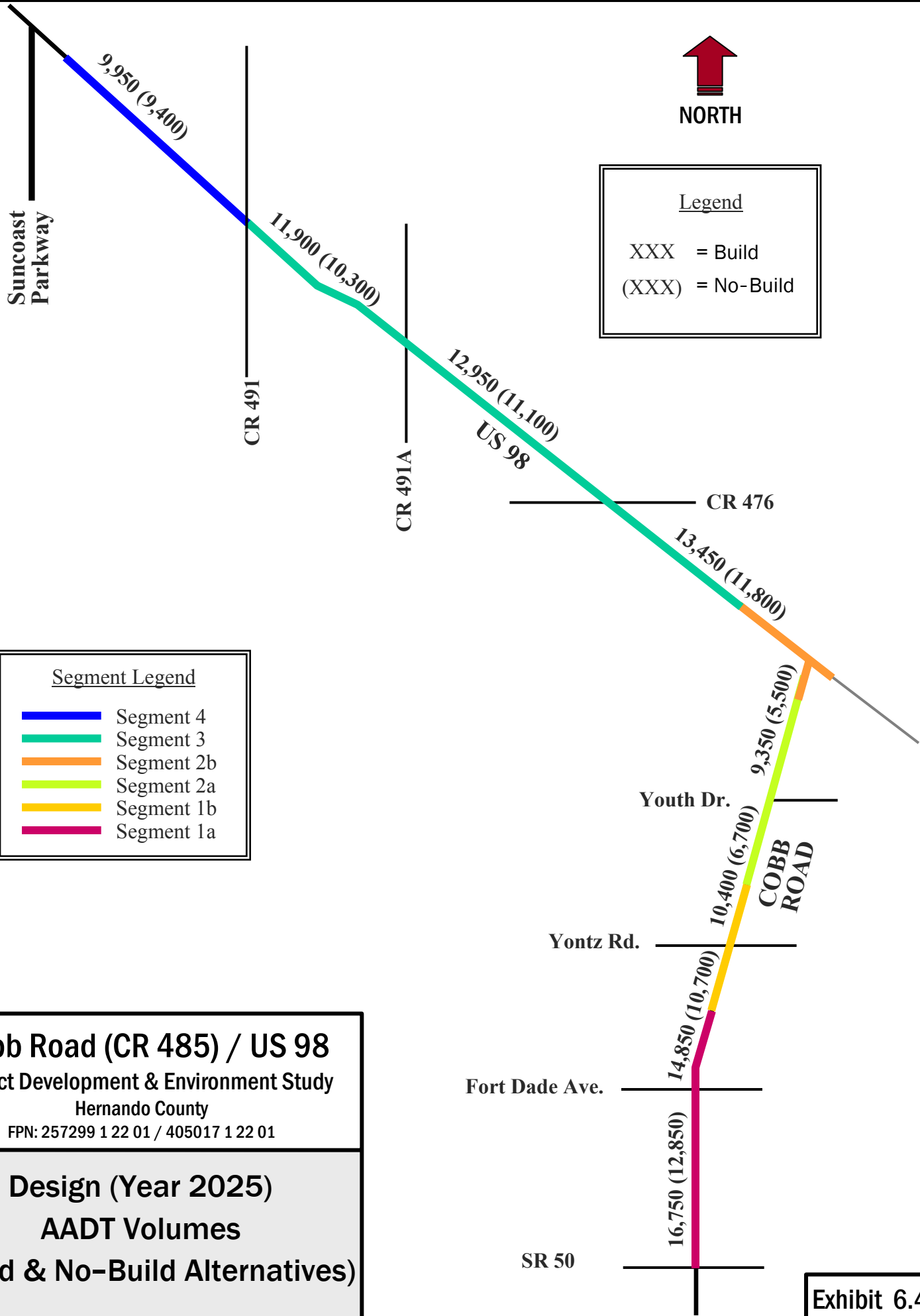
Many of these truck movements are associated with the quarry operations located adjacent to US 98 and the north section of Cobb Road. The operational characteristics (acceleration and braking distances) of these types of trucks are significantly different than those of typical motor vehicles. This mix creates a particularly undesirable safety situation on a two lane facility.

## **6.5 TRAFFIC VOLUME PROJECTIONS**

The year 2025 was selected as the design year for future year traffic analysis. The Tampa Bay Regional Planning Model (TBRPM) Version 4.0 (D11) was used as a baseline to forecast travel demand. The TBRPM is a travel demand model used to forecast long-term travel demand for highways and transit facilities in Hillsborough, Pinellas, Pasco, Hernando, and Citrus Counties. The current TBRPM traffic model calculates 2025 peak season traffic volumes. To convert the peak season model results to AADT volumes, the Hernando countywide model conversion factor (MOCF) of 0.94 was used. Using the current TBRPM traffic model with the 2025 socio-economic data and the base transportation network, the 2025 No-Build Alternative AADT volumes were developed by applying the above adjustment factors.

Both the Build and No-Build scenarios were based on the TBRPM, which includes Suncoast Parkway Project 2. **Exhibit 6.4** illustrates design year (2025) projected AADT for the Cobb Road Build and No-Build Alternatives.

The projected (Year 2025) two-way volumes were estimated utilizing projected AADTs and the  $K_{30}$  factor. **Exhibit 6.5** shows the projected design hour two-way volumes under the Build and No-Build Alternatives. Design year (2025) turning movement volumes for the Build Alternative were developed for two intersection configurations: a T-intersection with Cobb Road as the stem of the T (existing configuration), and a realigned intersection as called for in the Recommended Alternative. Design year turning movement volumes for the entire study corridor are shown in **Exhibit 6.6**.



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**Design (Year 2025)**  
**AADT Volumes**  
**(Build & No-Build Alternatives)**

**Exhibit 6.4**



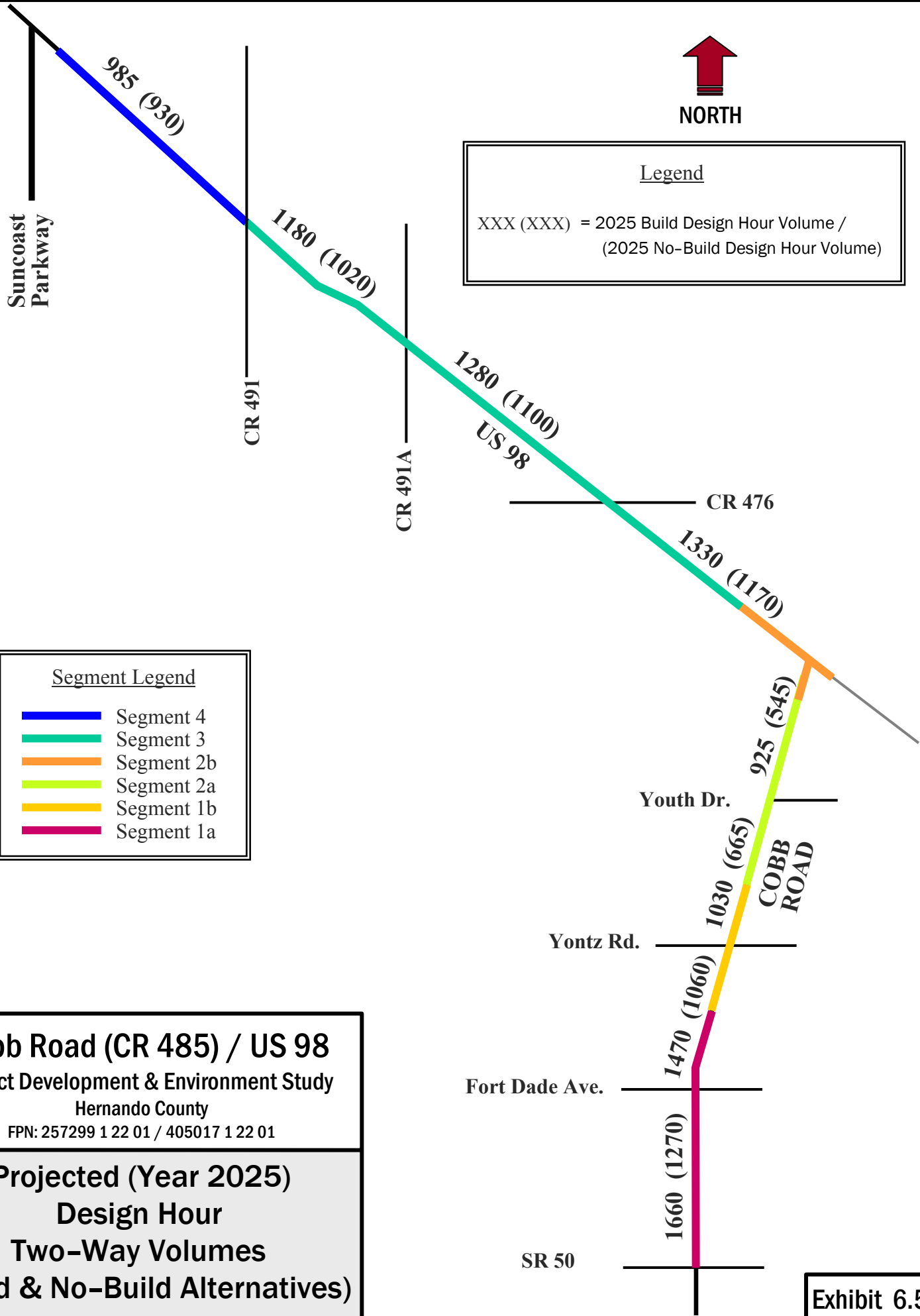
NORTH

Legend

XXX (XXX) = 2025 Build Design Hour Volume /  
(2025 No-Build Design Hour Volume)

Segment Legend

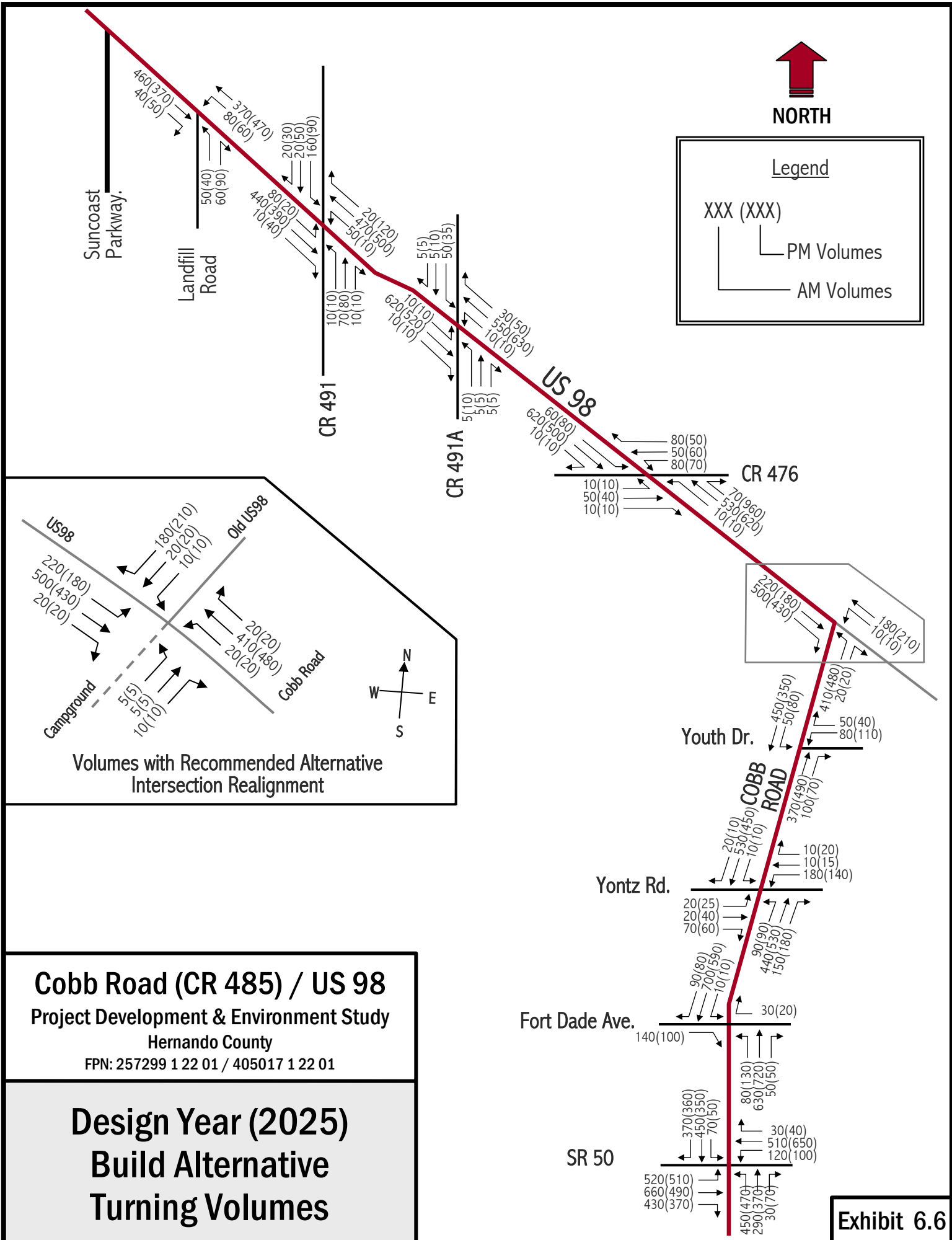
- █ Segment 4
- █ Segment 3
- █ Segment 2b
- █ Segment 2a
- █ Segment 1b
- █ Segment 1a



**Cobb Road (CR 485) / US 98**  
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**Projected (Year 2025)  
 Design Hour  
 Two-Way Volumes  
 (Build & No-Build Alternatives)**

Exhibit 6.5



## 6.6 LEVEL OF SERVICE

Capacity and Level of Service (LOS) were analyzed under existing conditions and for future design year Build and No-Build scenarios. Roadway intersections and segment links were analyzed separately.

### 6.6.1 Existing Levels of Service

#### 6.6.1.1 Intersections

Intersection Levels of Service (LOS) were estimated using the Highway Capacity Software (HCS) 2000. In the analysis, existing geometric conditions and traffic characteristics with respect to individual intersections were used. Annual average peak hour turning movement volumes were calculated by multiplying the collected turning movement volumes by the historical seasonal factor of 1.1 for the Hernando County area. Analyses results for un-signalized and signalized intersections are shown in **Table 6.1** and **Table 6.2**, respectively.

#### 6.6.1.2 Segments

The level of service analysis was conducted using the Highway Capacity Software (HCS) 2000. In the analysis, existing geometric conditions and traffic characteristics with respect to individual road segments were used. The results of this roadway segment level of service analysis for the existing conditions are summarized in **Table 6.3**.

**Table 6.1 Existing Year 2001 Levels of Service at Unsignalized Intersections**

Intersections	Level of Service	
	<i>AM Peak</i>	<i>PM Peak</i>
<b>Fort Dade Avenue with Cobb Road (All Way Stop)</b>		
NB Approach - Cobb Road	F	F
SB Approach - Cobb Road	F	E
EB Approach - Fort Dade Avenue	B	B
WB Approach - Fort Dade Avenue	B	B
<b>Yontz Road with Cobb Road (Two Way Stop)</b>		
NB Approach - Cobb Road Left Turn	A	A
SB Approach - Cobb Road Left Turn	A	A
EB Approach - Yontz Road	C	D
WB Approach - Yontz Road	D	D
<b>Youth Drive with Cobb Road (Two Way Stop)</b>		
SB Approach - Cobb Road Left Turn	A	A
WB Approach - Youth Drive	A	A
<b>CR 476 with US 98 (Two Way Stop)</b>		
NB Approach - US 98 Left Turn	A	A
SB Approach - US 98 Left Turn	A	A
EB Approach - CR 476	A	A
WB Approach - CR 476	A	A
<b>CR 491A with US 98 (Two Way Stop)</b>		
NB Approach - CR 491A	A	A
SB Approach - CR 491A	A	A
EB Approach - US 98 Left Turn	A	A
WB Approach - US 98 Left Turn	A	A
<b>CR 491 with US 98 (Two Way Stop)</b>		
NB Approach - CR 491	B	A
SB Approach - CR 491	B	B
EB Approach - US 98 Left Turn	A	A
WB Approach - US 98 Left Turn	A	A
<b>Landfill Road with US 98 (Two Way Stop)</b>		
NB Approach - Landfill Road	B	B
WB Approach - US 98 Left Turn	A	A

It should be noted that LOS ratings for Two Way stop controlled intersections reflect the minor street approach LOS and major street left turning movement LOS only; thus, no overall intersection LOS is reported. An overall LOS is applicable for four-way stops.

**Table 6.2 Existing Year 2001 Levels of Service at Signalized Intersections**

Intersections	Level of Service	
	<i>AM Peak</i>	<i>PM Peak</i>
<b>SR 50 with Cobb Road</b>	<b>C</b>	<b>C</b>
NB Approach - SR 50	C	C
SB Approach - Cobb Road	C	C
EB Approach - SR 50	C	B
WB Approach - SR 50A	C	C
<b>Cobb Road with US 98</b>	<b>A</b>	<b>A</b>
NB Approach - Cobb Road	B	B
EB Approach – US 98	A	A
WB Approach – US 98	A	A

**Table 6.3 Existing Year 2001 Level of Service on Highway Segments**

Arterial Segments	Design Hour LOS
<b>Cobb Road</b>	
SR 50 to Fort Dade Avenue	E
Fort Dade Avenue to Yontz Road	D
Yontz Road to Youth Drive	C
Youth Drive to US 98	C
<b>US 98</b>	
Cobb Road to CR 476	C
CR 476 to CR 491A	C
CR 491A to CR 491	C
CR 491 to Landfill Road	C
Landfill Road to Suncoast Parkway	C

## 6.6.2 Future Levels of Service

### 6.6.2.1 Intersections

The LOS at design year was estimated for the intersections with projected turning movements. The LOS for the Build and No-Build scenarios are listed in **Table 6.4**.

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**Table 6.4 Projected Levels of Service at Intersections**

Intersections	Level of Service	
	<i>Build (AM Peak/PM Peak)</i>	<i>No-Build (AM Peak/PM Peak)</i>
<b>Fort Dade Avenue with Cobb Road (All Way Stop)</b>		F/F
NB Approach - Cobb Road	B/B	F/F
SB Approach - Cobb Road	A/B	F/E
EB Approach - Fort Dade Avenue	B/B	C/C
WB Approach - Fort Dade Avenue	B/B	C/C
<b>Yontz Road with Cobb Road (Two Way Stop)</b>		
NB Approach - Cobb Road Left Turn	A/A	A/A
SB Approach - Cobb Road Left Turn	A/A	A/A
EB Approach - Yontz Road	A/A	C/D
WB Approach - Yontz Road	E/D	D/D
<b>Youth Drive with Cobb Road (Two Way Stop)</b>		
SB Approach - Cobb Road Left Turn	A/A	A/A
WB Approach - Youth Drive	A/B	A/A
<b>CR 476 with US 98 (Two Way Stop)</b>		
NB Approach - US 98 Left Turn	A/A	A/A
SB Approach - US 98 Left Turn	A/B	A/A
EB Approach - CR 476	A/A	C/C
WB Approach - CR 476	B/B	E/D
<b>CR 491A with US 98 (Two Way Stop)</b>		
NB Approach - CR 491A	A/A	A/A
SB Approach - CR 491A	A/A	A/A
EB Approach - US 98 Left Turn	A/A	A/A
WB Approach - US 98 Left Turn	A/A	A/A
<b>CR 491 with US 98 (Two Way Stop)</b>		
NB Approach - CR 491	B/B	B/B
SB Approach - CR 491	D/B	F/C
EB Approach - US 98 Left Turn	A/A	A/A
WB Approach - US 98 Left Turn	A/A	A/A
<b>Landfill Road with US 98 (Two Way Stop)</b>		
NB Approach – Landfill Road	B/B	C/C
WB Approach – US 98 Left Turn	A/A	A/A
<b>SR 50 with Cobb Road (Signalized)</b>	F/F	E/E
NB Approach – SR 50	F/F	E/D
SB Approach – Cobb Road	F/F	E/D
EB Approach – SR 50	F/F	E/E
WB Approach – SR 50A	C/E	C/E
<b>Cobb Road with US 98 (Signalized)</b>	A/A	A/A
NB Approach – Cobb Road	B/B	B/B
SB Approach – US 98	A/A	A/A
EB Approach – Campground Road	B/B	--
WB Approach – Old US 98	B/B	A/A



As can be seen in **Table 6.4**, the Build condition LOS at SR 50 is actually lower than for the No Build condition. This is most likely due to induced traffic. Since this project limit is immediately north of this intersection, it is suggested that the operation and geometry of this intersection be re-examined as part of the upcoming SR 50 study.

### 6.6.2.2 Segments

The LOS analyses of link segments were completed using HCS and the results are summarized in **Table 6.5**.

**Table 6.5 Projected Levels of Service on Highway Segments**

Arterial Segments	Build Alternative		No-Build Alternative
	Typical Section	Design Hour LOS	Design Hour LOS
<b>Cobb Road</b>			
SR 50 to Fort Dade Avenue	Urban	B	E
	Suburban	A	
Fort Dade Avenue to Yontz Road	Urban	A	D
	Suburban	A	
Yontz Road to Youth Drive	Rural	A	C
Youth Drive to US 98	Rural	A	C
<b>US 98</b>			
Cobb Road to CR 476	Rural	A	D
CR 476 to CR 491A	Rural	A	D
CR 491A to CR 491	Rural	A	D
CR 491 to Landfill Road	Rural	A	D
Landfill Road to Suncoast Parkway	Rural	A	D

### 6.6.3 Comparison with LOS Standards

According to the Transportation Element of the *Hernando County Comprehensive Plan*<sup>1</sup> and Table 6-1 of the 2002 *FDOT Quality / Level of Service Handbook*<sup>2</sup>, the LOS standard for Cobb Road and US 98 shall be “C” for the peak-hour traffic volume.

Comparison of the levels of service shown for the Build and No-Build Alternatives with these standards shows that the standard will not be met with the No-Build Alternative and the standard will be met with the Build Alternative.

## **6.7 QUEUE LENGTHS**

Queue length requirements were determined using HCM 2000 software. Since it is possible that through lane queuing can sometimes block access to right and left turn lanes, turn lane “queuing” requirements were reviewed against anticipated queues in the through lanes. In several cases, through queues were found to block access to the turn lane; however, in each case, the turn volume was very low. In these cases, turn lanes were not extended to clear the through queues since the resulting delays were considered minimal. Maximum queue lengths for the relevant intersections during the Year 2025 design hour are summarized by approach and individual lane in **Table 6.6**.

## **6.8 ACCESS MANAGEMENT**

The existing roadway and the No-Build Alternative roadway within the project limits are Access Class 4. Construction of the Build Alternative would result in reclassification to Access Class 3. **Exhibit 6.6** identifies each full and directional median opening as approved by FDOT’s Median Review Committee (February 2002). **Table 6.7** describes the type, location and distance of each median opening as identified in **Exhibit 6.7**.

**Table 6.6 Queue Lengths**

<b>Intersection</b>	<b>Traffic Control</b>	<b>Turn Lane</b>	<b>Storage Length (in feet)</b>
SR 50 with Cobb Road (With Existing Lane Arrangement)	Signal	Northbound Left – Cobb Road	725
		Southbound Left – Cobb Road	975 / 100
		Eastbound Left – SR 50	1625
		Eastbound Right – SR 50	800
		Westbound Left – SR 50A	750 / 125
SR 50 with Cobb Road (With Dual EB Left Turn Lanes)	Signal	Northbound Left – Cobb Road	550
		Southbound Left – Cobb Road	775 / 75
		Eastbound Left – SR 50	600
		Eastbound Right – SR 50	800
		Westbound Left – SR 50A	600 / 175
Cobb Road with US 98	Signal	Northbound Left – Cobb Road	50
		Southbound Left – US 98	100
		Eastbound Right – Campground	50
		Westbound Right – Old US 98	100
Fort Dade Ave with Cobb Road	Two Way Stop	Northbound Left – Cobb Road	50
		Southbound Left – Cobb Road	50
Yontz Road with Cobb Road	Two Way Stop	Northbound Left – Cobb Road	50
		Southbound Left – Cobb Road	50
Youth Drive with Cobb Road	Two Way Stop	Southbound Left – Cobb Road	50
CR 476 with US 98	Two Way Stop	Northbound Left – US 98	50
		Southbound Left – US 98	50
CR 491A with US 98	Two Way Stop	Eastbound Left – US 98	50
		Westbound Left – US 98	50
CR 491 with US 98	Two Way Stop	Eastbound Left – US 98	50
		Westbound Left – US 98	50
Landfill Road with US 98	Two Way Stop	Westbound Left – US 98	50

**Table 6.7 Median Openings**

MEDIAN OPENING ID NO.	MEDIAN OPENING TYPE	DESCRIPTION	STATION	DISTANCE TO NEXT OPENING(FT)
1	FULL (EXISTING)	C.R. 485/S.R. 50A	30+00	1398
2	DIRECTIONAL	C.R. 485/FORT DADE AVE	43+98	1277
3	DIRECTIONAL	C.R. 485/OLD COBB RD.	56+75	881
4	FULL	C.R. 485/WRF DRIVEWAY	65+57	3502
5	DIRECTIONAL	C.R. 485/COMMERCIAL	100+59	1225
6	DIRECTIONAL	C.R. 485/EWELL IND.	112+84	1046
7	FULL	C.R. 485/YONTZ RD.	123+29	2641
8	FULL	C.R. 485	149+70	2949
9	FULL	C.R. 485/YOUTH DR.	179+19	2654
10	DIRECTIONAL	C.R. 485	205+73	2643
11	DIRECTIONAL	C.R. 485	232+16	3287
12	FULL	C.R. 485/US 98 INTERSECTION	343+79	4117
13	FULL	US 98/SAWMILL	384+96	2386
14	DIRECTIONAL	US 98/RESIDENTIAL	408+83	1475
15	FULL	US 98/C.R. 476	423+58	1258
16	DIRECTIONAL	US 98/GOODWIN BROS.	436+16	1802
17	FULL	US 98/C.R. 491A	454+19	3584
18	DIRECTIONAL	US 98/TOWER DRIVEWAY	490+03	3088
19	DIRECTIONAL	US 98/RESIDENTIAL	520+91	1695
20	FULL	US 98/C.R. 491	537+85	3902
21	FULL	US 98/AUDREY RD.	576+87	4085
22	FULL	US 98/RES./FARM DRIVEWAY	617+73	2071
23	DIRECTIONAL	US 98/RESIDENTIAL	638+44	2171
24	FULL	US 98/HEBRON CHURCH RD.	660+15	1310
25	DIRECTIONAL (LEFT IN/LEFT OUT)	US 98/LANDFILL RD.	673+25	1937
26	FULL (EXISTING)	US 98/WORLD WOODS DR.	692+62	4034
27	DIRECTIONAL (EXISTING)	US 98/SUNCOAST RAMP	732+97	n/a

## 6.9 REFERENCES

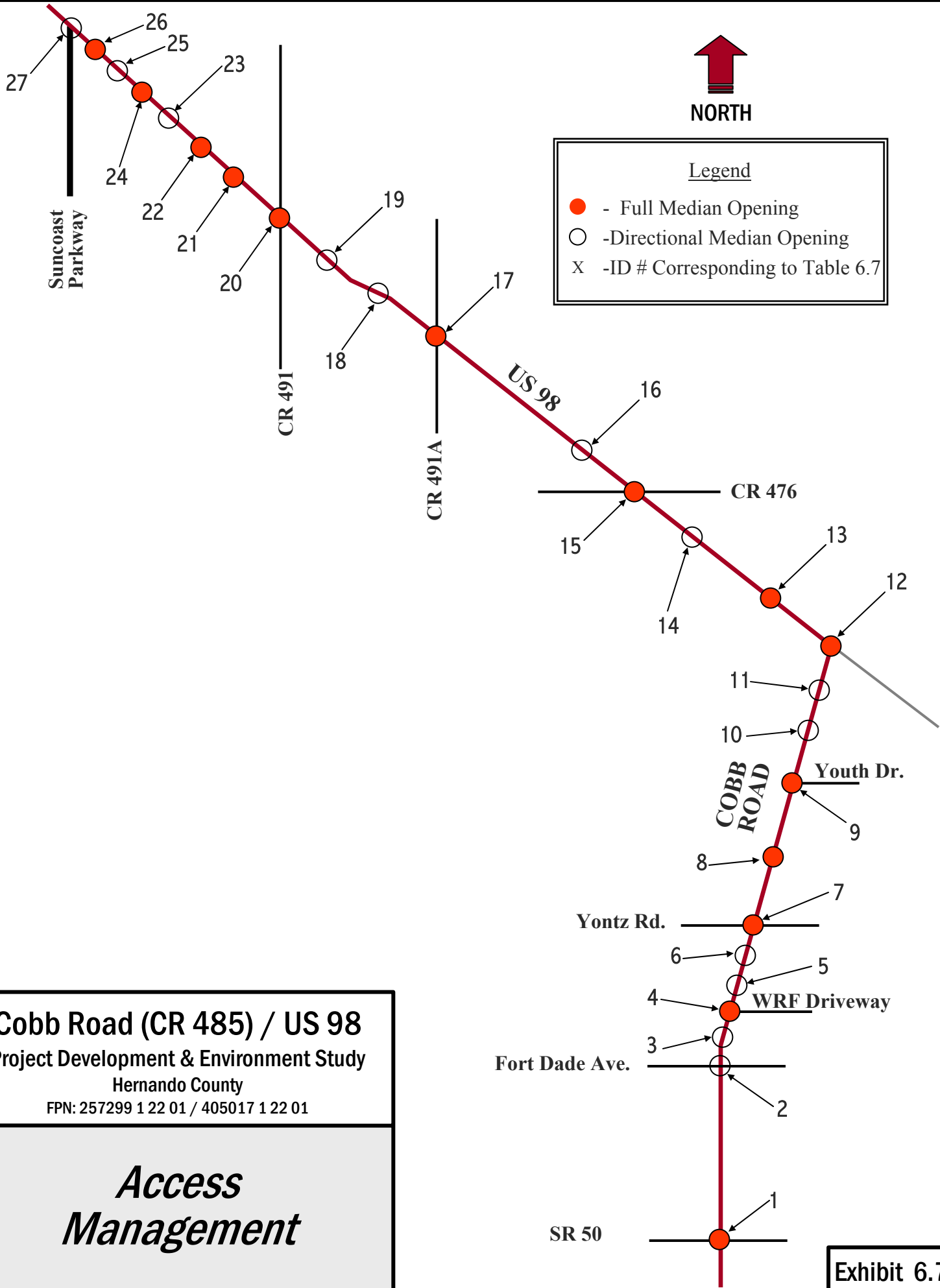
1. *Hernando County Comprehensive Plan*; Hernando County Board of County Commissioners; Adopted June 1989 and as amended.
2. *Quality / Level of Service Handbook*; Florida Department of Transportation, 2002.



NORTH

Legend

- - Full Median Opening
- - Directional Median Opening
- X - ID # Corresponding to Table 6.7



**Cobb Road (CR 485) / US 98**  
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 Hernando County  
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***Access Management***

**Exhibit 6.7**

## 7.0 CORRIDOR ANALYSIS

This chapter summarizes the project's corridor selection process. The objective of this analysis is to select a viable corridor where technically and environmentally sound alignment alternatives can be developed that are cost effective and acceptable to the community. When dealing with an existing facility, this effort is done to confirm that the existing corridor is the most viable. The purpose and need for this project include improving capacity and providing a safer enhanced route for truck traffic to use in bypassing downtown Brooksville. The viable corridor should meet these needs.

### 7.1 EVALUATION OF ALTERNATIVE CORRIDORS

Improvement of parallel facilities and development of new corridors were considered, as well as improvements to the existing Cobb Road / US 98 corridor. **Exhibit 7.1** provides a depiction of the corridors evaluated and some of the environmental constraints.

#### 7.1.1 Improvement of Existing Corridor

The existing Cobb Road / US 98 corridor begins with Cobb Road at SR 50 in the City of Brooksville and proceeds northward to the intersection of Cobb Road and US 98. The corridor then proceeds in the northwesterly direction on US 98 to the Suncoast Parkway. This connection from SR 50 to the Suncoast Parkway completes an effective bypass for truck traffic around the west side of the City of Brooksville and ties into the southern SR 50 bypass, which is currently being widened to four lanes. South of Yontz Road, the adjacent land uses are sparsely developed and consist primarily of industrial and mining areas with some agricultural and residential areas. As shown in **Exhibit 7.1**, Cobb Road north of Yontz Road and US 98 from Cobb Road to Suncoast Parkway travel through upland forest and agricultural lands, as well as portions of the proposed and previously purchased Annatteliga Hammock CARL project. Improving the existing Cobb Road / US 98 corridor is consistent with the *Hernando County Comprehensive Plan*<sup>1</sup> and the *2025 Long Range Transportation Plan (LRTP)*<sup>2</sup>.

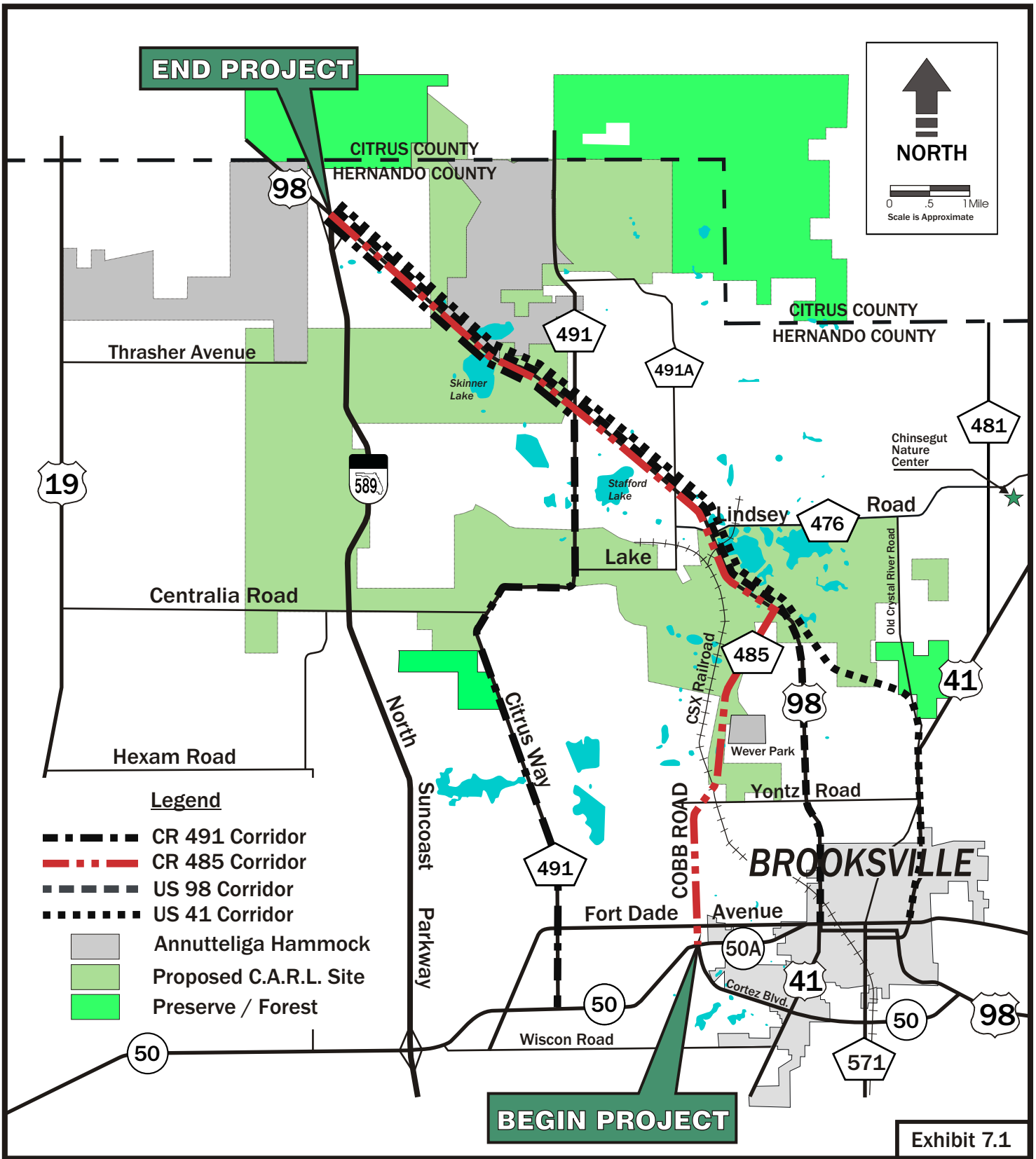


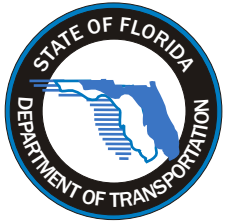
Exhibit 7.1



# Evaluated Corridors

## Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1  
FAP Nos: 2891 007 P & 2891 008 P



The Cobb Road / US 98 corridor is an existing alignment with gentle curves that is designated as a future evacuation route by the *Hernando County Comprehensive Plan*<sup>1</sup>. Right-of-way needs involved with improving this corridor would be minimal as compared to a new corridor development.

### **7.1.2 Improvement of Parallel Facilities**

CR 491 (Citrus Way) provides a circuitous north-south connection from SR 50 to US 98 approximately 1.75 to 3.69 miles west of Cobb Road. This facility runs predominantly through open land and upland forests. It is located between two major mining areas, through proposed CARL lands, and borders the west side of the southern mining area. On the opposite side of the road from the mining area are the privately owned Janet Butterfield Brooks Preserve (an FNAIP private preserve) just north of Bailey Hill Road and south of Centralia Road, and a large wetland approximately 4,100 ft. south of Bailey Hill Road. CR 491 is a narrow and winding two-lane facility that would necessitate large right-of-way acquisitions and potential wetland and Section 4(f) impacts if widened to four lanes. Though this facility would provide a bypass of downtown Brooksville, its winding alignment and sharp turns would prove to be a hindrance to enhanced truck traffic. It would not tie directly to the portions of the bypass being improved south of Brooksville. Improving CR 491 is not consistent with the *Hernando County Comprehensive Plan*<sup>1</sup> or the *LRTP*<sup>2</sup>. Although CR 491 is designated as a future evacuation route north of US 98, the portion south of US 98 is not designated as an existing or future evacuation route by the *Hernando County Comprehensive Plan*<sup>1</sup>.

US 98 (Ponce De Leon Boulevard) south of the intersection with Cobb Road provides an existing connection to SR 50. North of Yontz Road, the road traverses predominantly agricultural and upland forests. Significant land uses include the Pasco-Hernando Community College campus and a Florida Highway Patrol station on the west side of the road. South of Yontz Road, the corridor becomes more developed with commercial and residential land uses being more prevalent, especially within the Brooksville city limits. This corridor does not provide a bypass of the City of Brooksville for truck traffic and



therefore does not satisfy the purpose and need for the project. Improving US 98 south of Cobb Road is not consistent with the *Hernando County Comprehensive Plan*<sup>1</sup> or the *LRTP*<sup>2</sup>.

### 7.1.3 Development of a New Corridor

A new corridor connecting US 98 to Old Crystal River Road and US 41 to get to SR 50 on the east side of Brooksville was evaluated. This route would diverge from US 98 approximately 2,500 ft. south and east of the intersection with Cobb Road in a southeasterly direction before turning due east to tie into Our Road. This alignment would keep just to the south of proposed CARL lands. The predominant existing land uses are residential and upland forest. This route would bisect a residential neighborhood and would hamper community cohesion. The route is more indirect than the existing Cobb Road / US 98 corridor with intersections at Old Crystal River Road, US 41 and SR 50. This route passes between and would likely have major impacts to two wetlands at the northern city limits of Brooksville. According to the *Hernando County Comprehensive Plan*<sup>1</sup>, US 41 is designated as an existing evacuation route; however, providing this new corridor is not consistent with this plan or the MPO 2025 *LRTP*<sup>2</sup>. A greater involvement with right-of-way acquisition would take place with implementation of this new corridor. This corridor does not provide a bypass of the City of Brooksville for truck traffic and therefore does not satisfy the need for the project.

## 7.2 SELECTION OF VIABLE CORRIDOR ALTERNATIVES

The existing Cobb Road / US 98 corridor is the only corridor that will satisfy the goal of the *LRTP*<sup>2</sup> and the project objective of providing a safe and efficient bypass for truck traffic around the City of Brooksville. Developing alternative corridors to this level would result in major impacts to social, recreational, cultural, and environmental resources, as well as a substantial number of relocations and right-of-way costs. These impacts will be held to a minimum by using the existing Cobb Road / US 98 corridor, which is consistent with the *Hernando County Comprehensive Plan*<sup>1</sup> and *LRTP*<sup>2</sup> and their

designation of Cobb Road as a future evacuation route. No prudent and feasible alternative to the Cobb Road / US 98 corridor exists; therefore, improvements will be best accomplished along the existing corridor.

### **7.3 REFERENCES**

1. *Hernando County Comprehensive Plan*; Hernando County Board of County Commissioners; Adopted June 1989 and as amended.
2. *Hernando County MPO 2025 Long Range Transportation Plan*; Hernando County, Florida; 2002.

## 8.0 ALTERNATIVES ANALYSIS

### 8.1 NO BUILD ALTERNATIVE

Under the No Build Alternative, no action would be taken with respect to improving the Cobb Road / US 98 corridor, regardless of whether or not the Suncoast Parkway Project 2 is implemented north of US 98. The advantages of the No-Build Alternative include:

- No right-of-way acquisition,
- No construction costs,
- No relocations,
- No inconveniences to the motoring public due to construction,
- No inconveniences to the adjacent property owners due to construction, and
- No environmental degradation or disruption of natural resources due to the construction.

The disadvantages of the No Build Alternative include:

- No provisions to accommodate the anticipated growth in traffic volumes,
- Without improvements, the transportation network would become congested and fail to meet minimum levels of service,
- Traffic delays would be extended and the potential for higher accident rates would be increased,
- Both air pollution and road user costs would be increased, and
- Inconsistency with the Hernando County MPO 2025 L RTP<sup>1</sup>.

Based on the No Build Alternative having major deficiencies, it is not recommended.

## 8.2 TRANSPORTATION SYSTEM MANAGEMENT ALTERNATIVE

Transportation System Management (TSM) involves minor intersection improvements, increased turn lane storage, improvement of existing lane configuration marking and signalization sequencing as a means of improving level of service on a particular facility. The unacceptable levels of service anticipated to occur on the existing facility in the year 2025 justify the need to provide additional through lanes on Cobb Road and US 98. Therefore, the TSM Alternative is not considered a viable alternative for this project.

## 8.3 ALTERNATIVES DEVELOPMENT

### 8.3.1 Project Segmentation

To effectively evaluate the impacts of the planned project, options for aligning the proposed typical sections were analyzed within distinct segments along the project corridor. The segments of Cobb Road were chosen based on surrounding characteristics such as land use and environmental constraints, as well as the potential need for realignments. The segments of US 98 were chosen to match FDOT resurfacing project limits for consistency. The segments of the project are identified as follows:

- **Segment 1a:** Cobb Road from north of SR 50 to north of the Brooksville Water Reclamation Facility (WRF) driveway
- **Segment 1b:** Cobb Road from north of the Brooksville WRF driveway to north of Yontz Road
- **Segment 2a:** Cobb Road from north of Yontz Road to south of US 98
- **Segment 2b:** Cobb Road/US 98 Intersection
- **Segment 3:** US 98 from north of Cobb Road to CR 491
- **Segment 4:** US 98 from CR 491 to Suncoast Parkway

### 8.3.2 Alternatives Analysis Methodology

Initially, a number of typical section and alignment alternatives were identified for each segment as described below in **Section 8.3.3** through **Section 8.3.7**. Each of these

alternatives was evaluated based on eight (8) different criteria, including: right-of-way width required, number of parcels impacted, potential relocations, impacts to wetlands, impacts to 100-yr floodplains, impacts to Section 4(f) sites, impacts to noise sensitive sites and impacts to potential contamination sites. Each of these impacts was quantified in the **Preliminary Alternatives Screening Matrix**, shown in **Table 8.1**. Methodologies used to determine the impacts to each of these criteria are outlined in the various corresponding reports prepared for this PD&E study. As a result of comments received from the public after the Public Workshop (June 13, 2002, D.S. Parrott Middle School), two additional alternatives were added to the evaluation matrix; one each for Segments 1a and 2a.

Several alternatives were associated with significantly higher impacts based on the criteria utilized; therefore, those respective alternatives were dismissed as described below in **Section 8.3.3** through **Section 8.3.7**. The remaining alternatives are viable and were carried forward for further evaluation.

### **8.3.3 Segment 1a**

The limits of Segment 1a are along Cobb Road (CR 485) from north of SR 50 to north of the Brooksville WRF driveway. The existing Cobb Road roadway from SR 50 to Shadyside Drive was previously upgraded to a four-lane urban facility in conjunction with the SR 50 improvement project from Colorado Street to Cobb Road. The existing roadway from Shadyside Drive to north of the Brooksville WRF driveway is a two-lane facility, centered within a right-of-way width which varies from 100 ft. to 140 ft.

Seven alternatives were initially developed for Segment 1a. Following the Public Workshop, one additional alternative was developed as a result of comments received. These eight alternatives involved four different typical sections (expandable urban, non-expandable urban, suburban and suburban save-the-pavement), coupled with three different alignments (left, right and center) as follows:

**Table 8.1 Preliminary Alternatives Screening Matrix**

Typical Section: Alignment:	URBAN				SUBURBAN			SUBURBAN LEFT TRANSITIONING TO RURAL LEFT	RURAL						SAVE PAV'T
	LEFT	RIGHT	CENTER	FIT W/IN EXISTING RW	LEFT	RIGHT	CENTER		LEFT	RIGHT	CENTER	BEST FIT	LEFT 'T'	RIGHT 'T'	
<b>SEGMENT 1A</b>															
Typical Existing ROW Width (ft.)	120	120	120	120	120	120	120								120
Proposed ROW Width (ft.)	137	137	137	120	158	158	158								161 (Suburban)
Additional ROW Width Required (ft.)	17	17	17	0	38	38	38								41
Wetlands Impacted (acres)	0.2	0.2	0.2	0	0.4	0.4	0.4								0.4
100-Year Floodplain Impact (acres)	0.1	0.1	0.1	0.07	0.2	0.1	0.2								0.2
Potential Contamination Sites	1	1	1	0	1	1	1								1
No. of Parcels Impacted	14	24	24	1	14	21	24								14
Potential 4(f) Impact Area (acres)	0	0	0	0	0	0	0								0
Relocations	0	2	2	0	1	3	2								1
Noise Sensitive Sites	11	11	11	11	11	11	11								11
<b>PRELIMINARY EVALUATION</b>	VIABLE	DISMISS	DISMISS	VIABLE	VIABLE	DISMISS	DISMISS								VIABLE
<b>SEGMENT 1B</b>															
Typical Existing ROW Width (ft.)	120	120	120		120	120	120								120
Proposed ROW Width (ft.)	137	137	137		158	158	158								240
Additional ROW Width Required (ft.)	17	17	17		38	38	38								161 (Suburban)
Wetlands Impacted (acres)	0.1	0.3	0.2		0.1	0.4	0.2								41
100-Year Floodplain Impact (acres)	0	0	0		0	0	0								1.8
Potential Contamination Sites	1	0	0		1	0	0								0.1
No. of Parcels Impacted	6	18	22		6	17	22								0
Potential 4(f) Impact Area (acres)	0	0	0		0	0	0								1
Relocations	0	2	0		0	2	2								6
Noise Sensitive Sites	2	2	2		2	2	2								0
<b>PRELIMINARY EVALUATION</b>	VIABLE	DISMISS	DISMISS		VIABLE	DISMISS	DISMISS								3
															2
															DISMISS
															VIABLE
<b>SEGMENT 2A</b>															
Typical Existing ROW Width (ft.)								135	135	135	135	135			135
Proposed ROW Width (ft.)								158 - 240	240	240	240	240			240 (Rural)
Additional ROW Width Required (ft.)								23 - 105	105	105	105	105			105
Wetlands Impacted (acres)								2.7	2.9	3.3	3.1	2.8			2.8
100-Year Floodplain Impact (acres)								0	0	0	0	0			0
Potential Contamination Sites								0	0	0	0	0			0
No. of Parcels Impacted								7	8	6	12	11			13
Potential 4(f) Impact Area (acres)								0	0	4.8	2.2	0			0
Relocations								0	0	0	0	0			0
Noise Sensitive Sites								1	1	1	1	1			1
<b>PRELIMINARY EVALUATION</b>								VIABLE	VIABLE	DISMISS	DISMISS	VIABLE			VIABLE
<b>SEGMENT 2B</b>															
Typical Existing ROW Width (ft.) [Cobb Rd (US 98)]													135 (200)	135 (200)	135 (200)
Proposed ROW Width (ft.)													240	240	240 (Rural)
Additional ROW Width Required (ft.)													105 (40)	105 (40)	105 (40)
Wetlands Impacted (acres)													0.1	0.1	0.1
100-Year Floodplain Impact (acres)													0	0	0
Potential Contamination Sites													0	0	0
No. of Parcels Impacted													8	12	9
Potential 4(f) Impact Area (acres)													0	0	0
Relocations													0	0	0
Noise Sensitive Sites													0	0	0
<b>PRELIMINARY EVALUATION</b>													VIABLE	DISMISS	VIABLE
															VIABLE
<b>SEGMENT 3</b>															
Typical Existing ROW Width (ft.)								200	200	200					200
Proposed ROW Width (ft.)								240	240	240					240 (Rural)
Additional ROW Width Required (ft.)								40	40	40					40
Wetlands Impacted (acres)								0.1	0.1	0.1					0.1
100-Year Floodplain Impact (acres)								0	0.1	0					0
Potential Contamination Sites								0	1	1					0
No. of Parcels Impacted								40	40	71					37
Potential 4(f) Impact Area (acres)								0	0.8	0.5					0
Relocations								2	3	2					3
Noise Sensitive Sites								6	6	6					6
<b>PRELIMINARY EVALUATION</b>								VIABLE	DISMISS	DISMISS					DISMISS
<b>SEGMENT 4</b>															
Typical Existing ROW Width (ft.)								200	200	200					200
Proposed ROW Width (ft.)								240	240	240					240 (Rural)
Additional ROW Width Required (ft.)								40	40	40					40
Wetlands Impacted (acres)								0.6	0.3	0.3					0.6
100-Year Floodplain Impact (acres)								0.16	0.5	0.2					0
Potential Contamination Sites								1	0	1					1
No. of Parcels Impacted								20	22	42					20
Potential 4(f) Impact Area (acres)								0	6.6	3.7					0
Relocations								1	2	3					1
Noise Sensitive Sites								12	12	12					12
<b>PRELIMINARY EVALUATION</b>								VIABLE	DISMISS	DISMISS					DISMISS

#### 8.3.3.1 Urban Typical Section (Expandable)

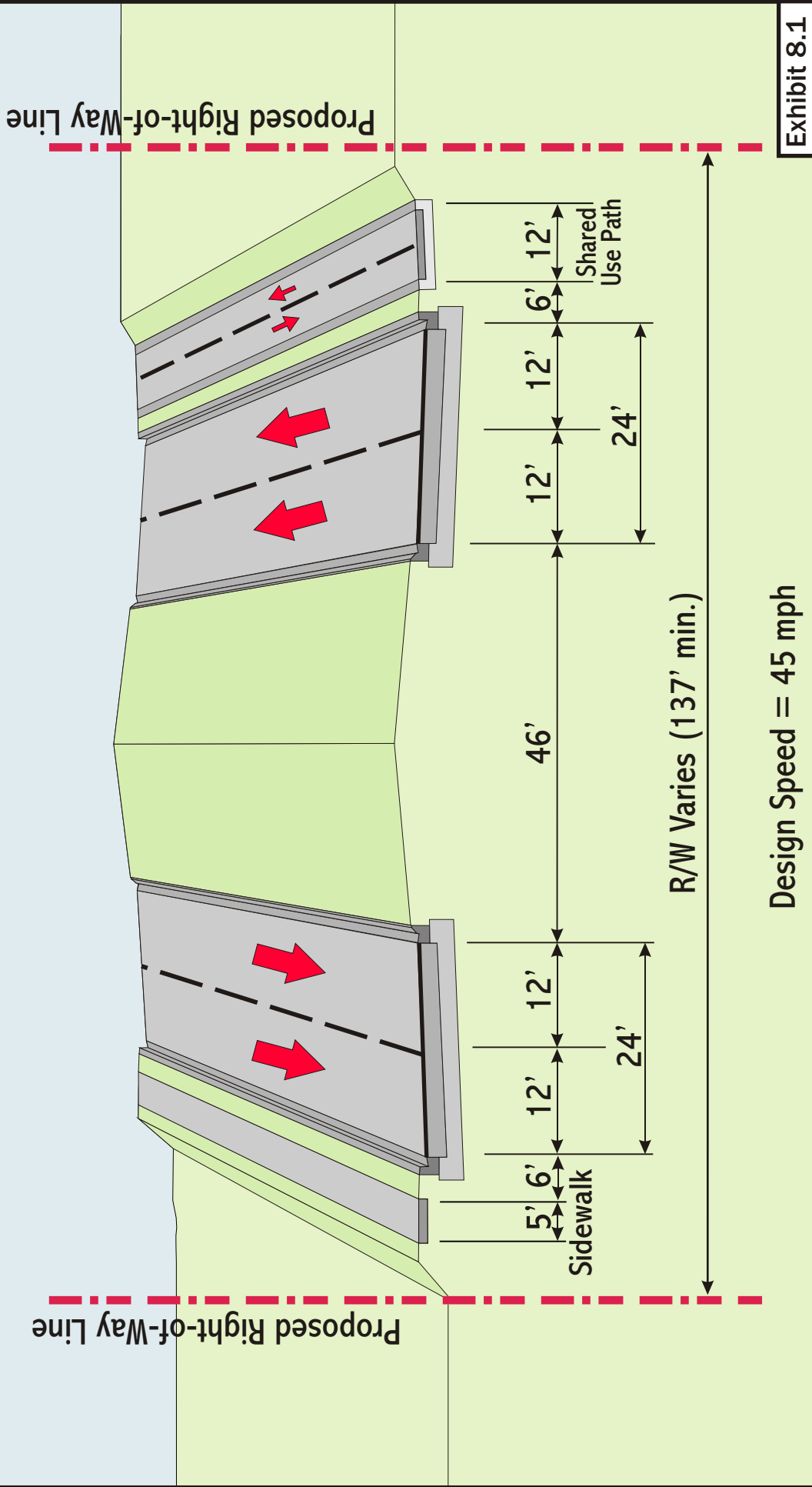
The first typical section alternative for Segment 1a, shown in **Exhibit 8.1**, is a four-lane divided urban roadway with a 46-ft. median. This typical section consists of two 12-ft. travel lanes in each direction, a 5-ft. sidewalk on the left side and a 12-ft. shared use path on the right side. The proposed minimum right-of-way width is 137 ft. The proposed design speed is 45 mph. This urban typical section would accommodate a future six-lane roadway with widening to the inside. Three alignment alternatives were considered for this typical section:

- Left Alignment: 17 ft. of additional right-of-way would be acquired from the left (west) side of the existing corridor. This is a **viable** alternative.
- Right Alignment: 17 ft. of additional right-of-way would be acquired from the right (east) side of the existing corridor. This alternative was dismissed due to the greater number of relocations and parcels impacted and the character of the adjacent land use to the right of the existing roadway.
- Center Alignment: 8.5 ft. of additional right-of-way would be acquired from each side of the existing corridor. This alternative was dismissed due to the greater number of relocations and parcels impacted and the character of the adjacent land use to the right of the existing roadway.

#### 8.3.3.2 Urban Typical Section (Non-Expandable)

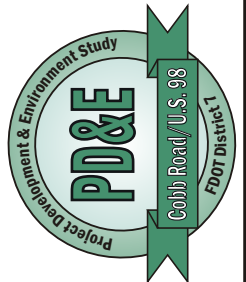
The second typical section alternative for Segment 1a, shown in **Exhibit 8.2**, is a four-lane divided urban roadway with a 17.5-ft. median. This typical section consists of two 12-ft. travel lanes in each direction, a 6-ft. sidewalk on the left side and a 12-ft. shared use path on the right side. The proposed minimum right-of-way width is 100 ft. The proposed design speed is 45 mph.

This alternative was developed in response to comments received as a result of the Public Workshop on June 13, 2002. Due to the strong desire of the public not to involve right-



**PROPOSED URBAN TYPICAL SECTION (EXPANDABLE)**  
 (SEGMENTS 1a and 1b)

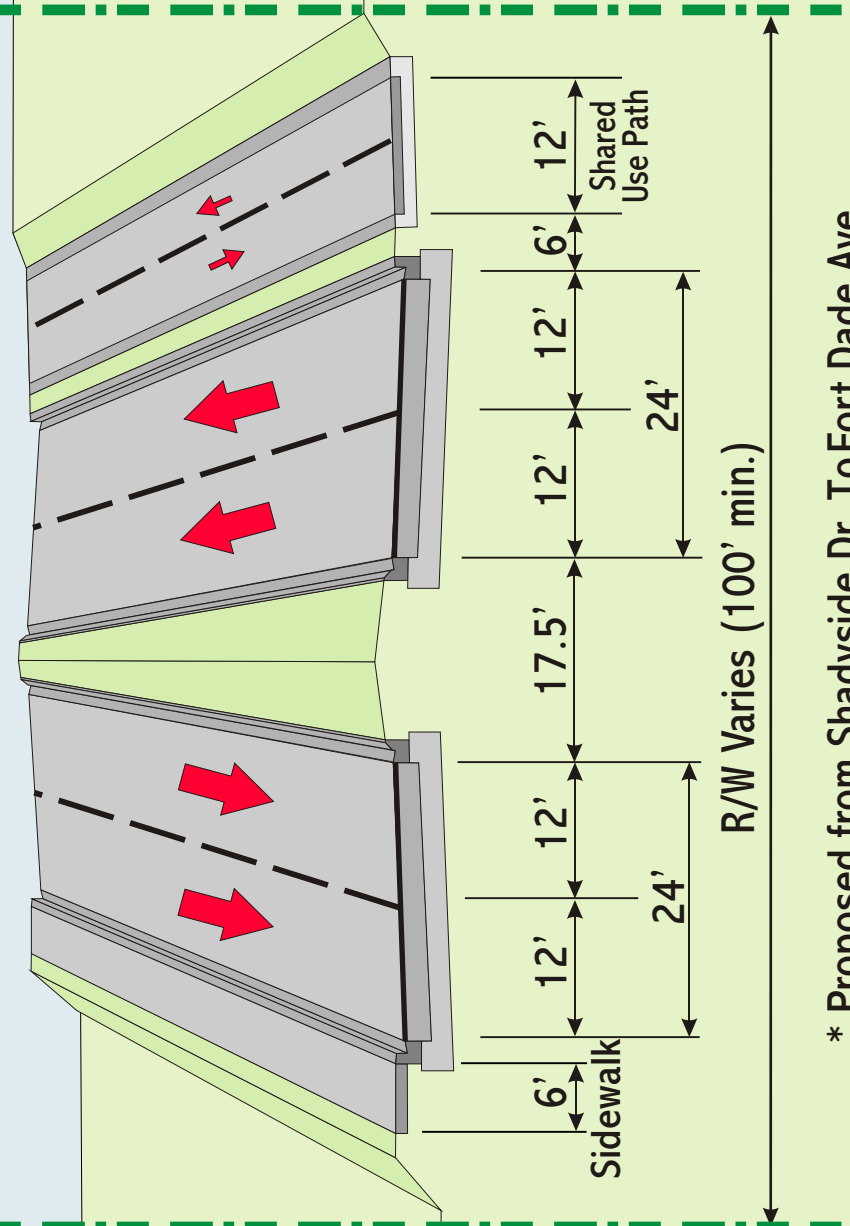
Cobb Road (CR 485) / US 98 PD&E Study  
 WPI Segment Nos: 257299 1 & 405017 1  
 FAP Nos: 2891 007 P & 2891 008 P





Existing Right-of-Way Line

Existing Right-of-Way Line

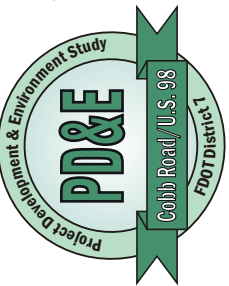


R/W Varies (100' min.)

\* Proposed from Shadyside Dr. To Fort Dade Ave.

Design Speed = 45 mph

Exhibit 8.2



**PROPOSED URBAN TYPICAL SECTION (NON-EXPANDABLE)**  
**(SEGMENT 1a)**

Cobb Road (CR 485) / US 98 PD&E Study  
 WPI Segment Nos: 257299 1 & 405017 1  
 FAP Nos: 2891 007 P & 2891 008 P



of-way acquisition in this urbanized segment of the project, this urban typical section was developed, which would not be expandable to a six-lane facility. This typical section fits within the existing right-of-way, with the exception of a small 0.002-acre clip from the northwest corner of the intersection at Shadyside Drive. This is a **viable** alternative.

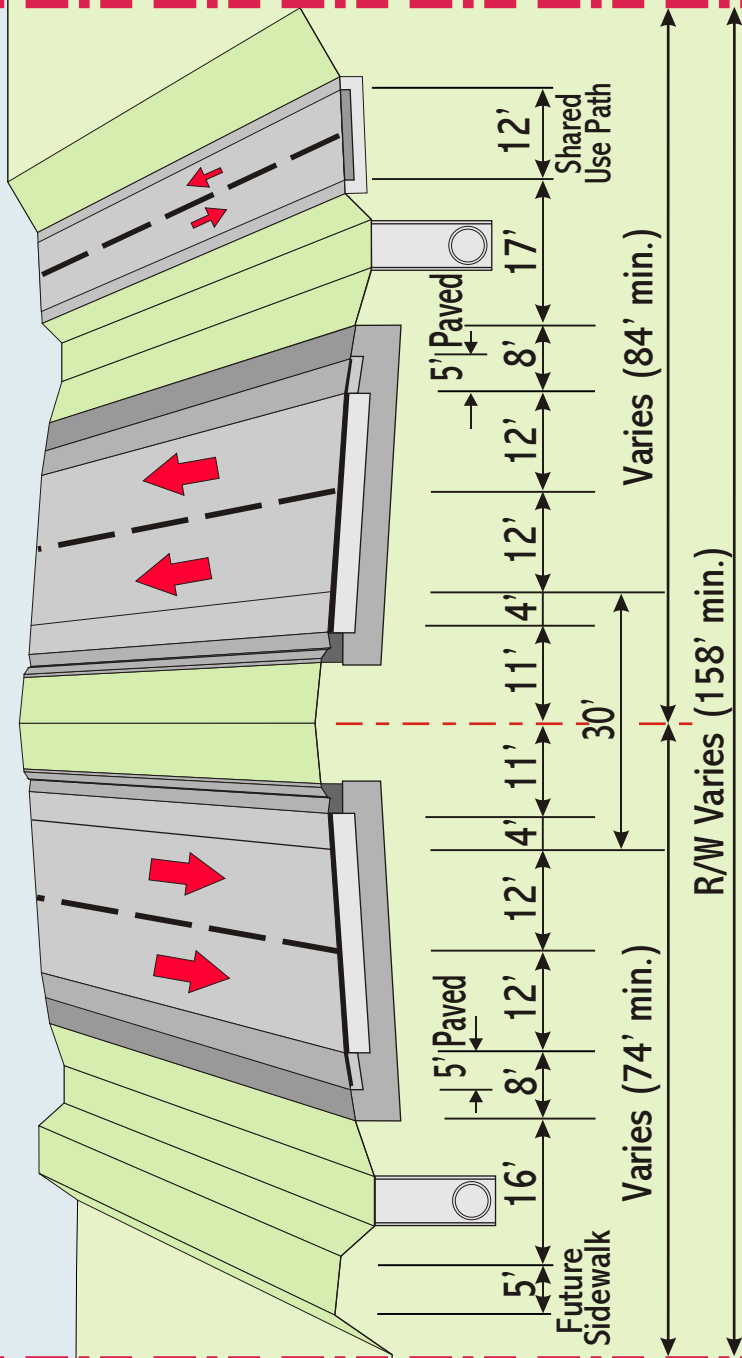
### 8.3.3.3 Suburban Typical Section

The third typical section alternative for Segment 1a, shown in **Exhibit 8.3**, is a four-lane divided suburban roadway with a 30-ft. median (22-ft. curb to curb and 4-ft. offsets to edge of inside travel lanes). This typical section consists of two 12-ft. travel lanes in each direction with 8-ft. outside shoulders (5 ft. paved) and a 12-ft. shared use path on the right side. Roadside drainage is handled in shallow swales with ditch bottom inlets. The proposed minimum right-of-way width is 158 ft., and the proposed design speed is 55 mph. This suburban typical section would accommodate a future six-lane roadway by milling, resurfacing, outside widening and re-striping the existing pavement. The new fifth and sixth travel lanes could be added adjacent to the outside edge of pavement along with a curb and gutter drainage system. Three alignment alternatives were considered for this typical section:

- Left Alignment: 38 ft. of additional right-of-way would be acquired from the left (west) side of the existing corridor. This is a **viable** alternative.
- Right Alignment: 38 ft. of additional right-of-way would be acquired from the right (east) side of the existing corridor. This alternative was dismissed due to the greater number of relocations and parcels impacted and the character of the adjacent land use to the right of the existing roadway.
- Center Alignment: 19 ft. of additional right-of-way would be acquired from each side of the existing corridor. This alternative was dismissed due to the greater number of relocations and parcels impacted and the character of the adjacent land use to the right of the existing roadway.

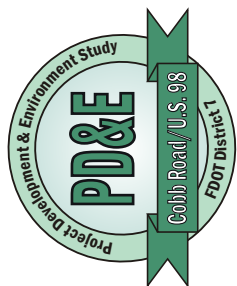
Proposed Right-of-Way Line

Proposed Right-of-Way Line



Design Speed = 55 mph

Exhibit 8.3



# PROPOSED SUBURBAN TYPICAL SECTION

(SEGMENTS 1a, 1b and 2a)

Cobb Road (CR 485) / US 98 PD&E Study

WPI Segment Nos: 257299 1 & 405017 1

FAP Nos: 2891 007 P & 2891 008 P



#### 8.3.3.4 Suburban Save-the-Pavement Typical Section

The fourth typical section alternative considered for Segment 1a is a four-lane divided suburban roadway, shown in **Exhibit 8.4**, which is being developed as an approach to utilize the existing roadway as the proposed northbound lanes. This would require construction of the two (2) new southbound lanes to the left (west) of the existing roadway. This typical section consists of a four-lane suburban roadway with a 30-ft. median (22-ft. curb to curb and 4-ft. inside shoulder offsets to edge of inside travel lanes), a 12-ft. shared use path to the right and a 5-ft. sidewalk to the left. There are two 12-ft. lanes and 8-ft. (5-ft. paved) outside shoulders in each direction. The design speed for this roadway is 55 mph. The proposed minimum right-of-way width required for this alternative is 161 ft. One alignment alternative was considered for this typical section:

- Left Alignment: 41 ft. of additional right-of-way would be acquired from the left (west) side of the existing corridor. This is a **viable** alternative.

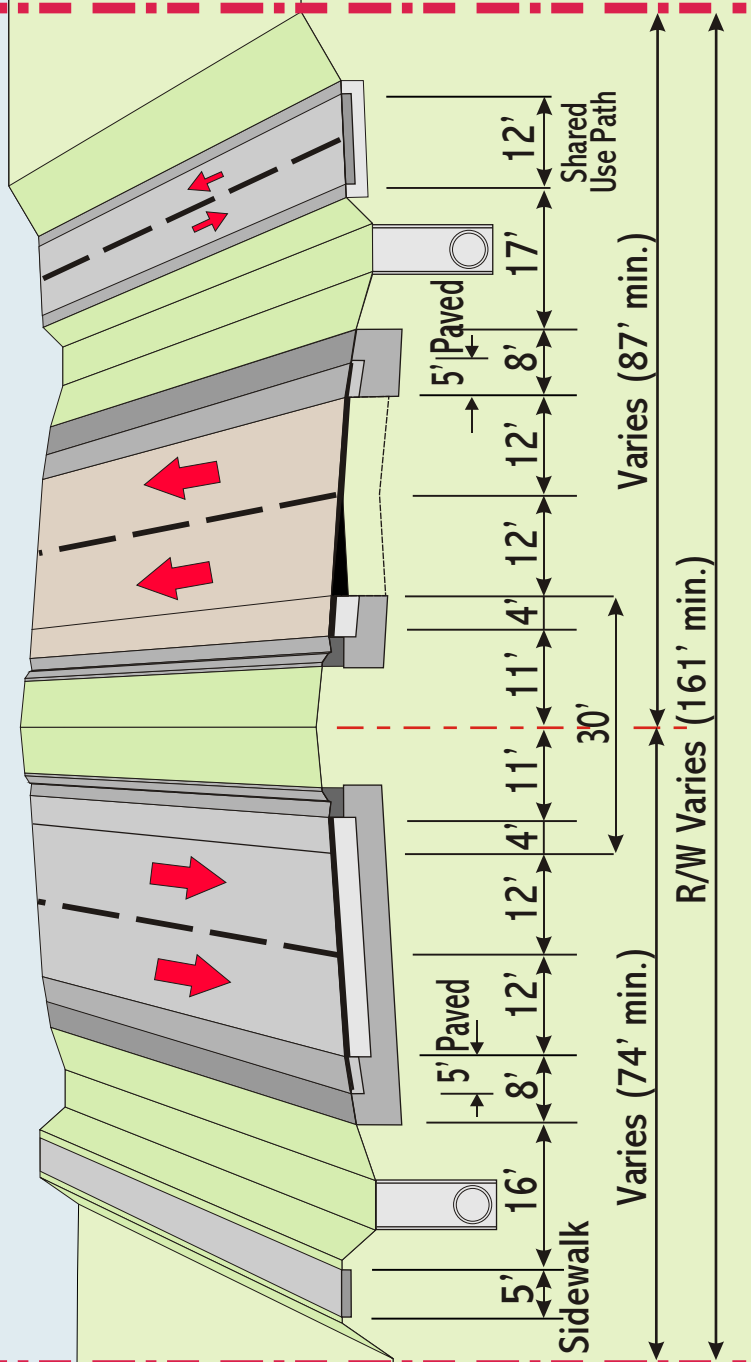
#### **8.3.4 Segment 1b**

The limits of Segment 1b are along Cobb Road from north of the Brooksville WRF driveway to north of Yontz Road. The existing roadway is a two-lane facility, centered within 120 ft. of right-of-way.

Eight alternatives were initially developed for Segment 1b. These alternatives involved three different typical sections (urban, suburban and suburban save-the-pavement) coupled with three different alignments (left, right and center), as well as a rural typical section realignment, as follows:

Proposed Right-of-Way Line

Proposed Right-of-Way Line



Sidewalk

Varies (74' min.)

R/W Varies (161' min.)

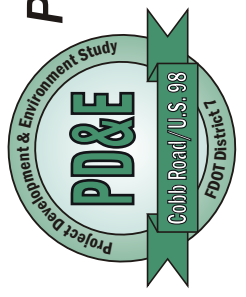
Varies (87' min.)

Shared Use Path

Saved Pavement

Design Speed = 55 mph

Exhibit 8.4



**PROPOSED SUBURBAN SAVE THE PAVEMENT TYPICAL SECTION**

**(SEGMENTS 1a, 1b and 2a)**

**Cobb Road (CR 485) / US 98 PD&E Study**

WPI Segment Nos: 257299 1 & 405017 1

FAP Nos: 2891 007 P & 2891 008 P

#### 8.3.4.1 Urban Typical Section

The urban typical section proposed for Segment 1b is as described above in **Section 8.3.3.1** and shown in **Exhibit 8.1**. Three alignment alternatives were considered for this typical section:

- Left Alignment: 17 ft. of additional right-of-way would be acquired from the left (west) side of the existing corridor. This is a **viable** alternative.
- Right Alignment: 17 ft. of additional right-of-way would be acquired from the right (east) side of the existing corridor. This alternative was dismissed due to the greater number of relocations and parcels impacted and the character of the adjacent land use to the right of the existing roadway.
- Center Alignment: 8.5 ft. of additional right-of-way would be acquired from each side of the existing corridor. This alternative was dismissed due to the greater number of parcels impacted and the character of the adjacent land use to the right of the existing roadway.

#### 8.3.4.2 Suburban Typical Section

The suburban typical section proposed for Segment 1b is as described above in **Section 8.3.3.3** and shown in **Exhibit 8.3**. Three alignment alternatives were considered for this typical section:

- Left Alignment: 38 ft. of additional right-of-way would be acquired from the left (west) side of the existing corridor. This is a **viable** alternative.
- Right Alignment: 38 ft. of additional right-of-way would be acquired from the right (east) side of the existing corridor. This alternative was dismissed due to the greater number of relocations and parcels impacted and the character of the adjacent land use to the right of the existing roadway.
- Center Alignment: 19 ft. of additional right-of-way would be acquired from each side of the existing corridor. This alternative was dismissed due to the greater

number of relocations and parcels impacted and the character of the adjacent land use to the right of the existing roadway.

#### 8.3.4.3 Suburban Save-the-Pavement Typical Section

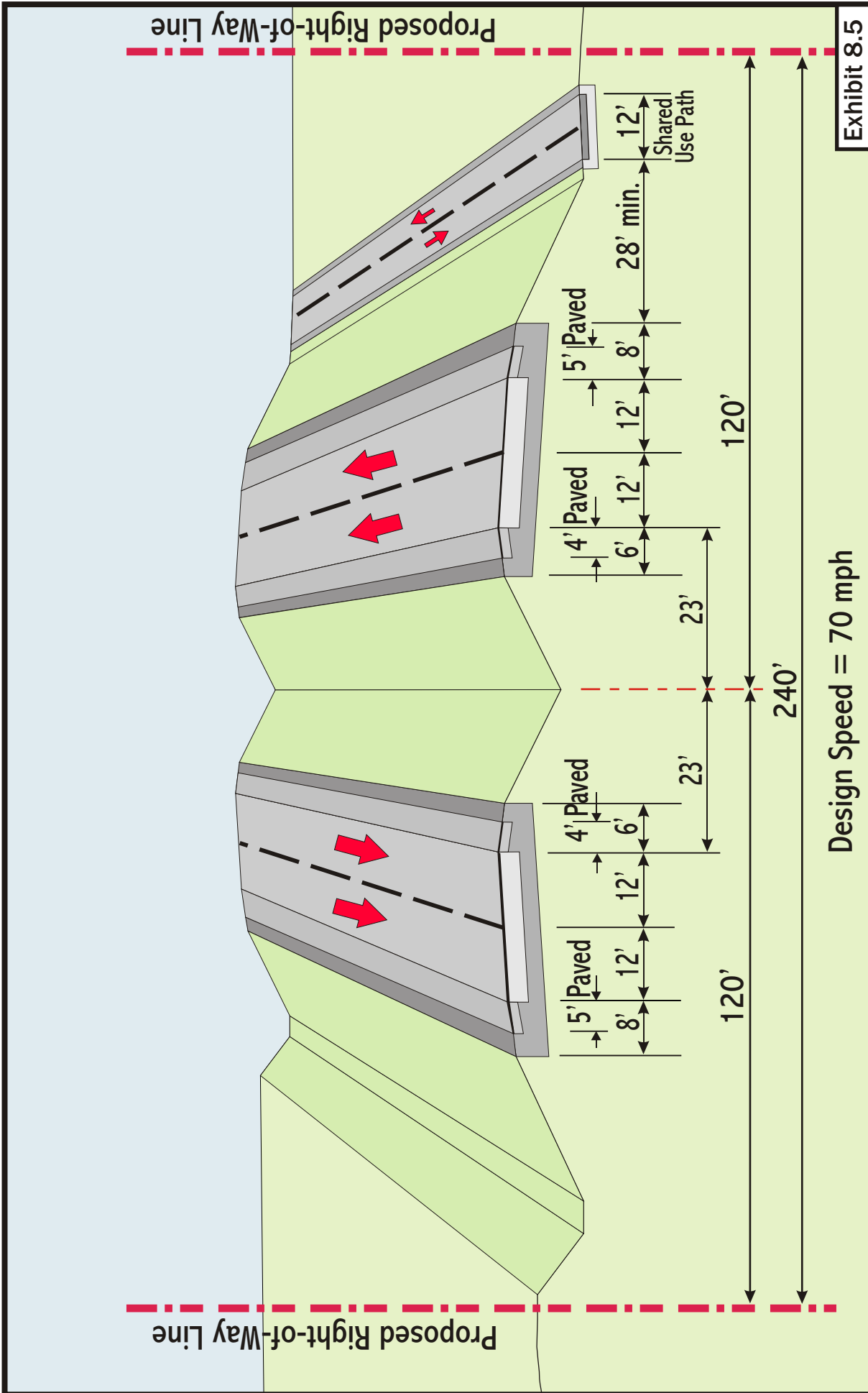
The suburban save-the-pavement typical section proposed for Segment 1b is as described above in **Section 8.3.3.4** and shown in **Exhibit 8.4**. One alignment alternative was considered for this typical section:

- Left Alignment: 41 ft. of additional right-of-way would be acquired from the left (west) side of the existing corridor. This is a **viable** alternative.

#### 8.3.4.4 Rural Typical Section (New Alignment)

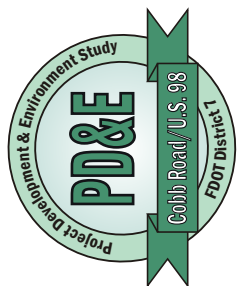
Due to some early perceived design difficulties in Segment 1b with the existing CSX railroad crossing and the rail switch immediately adjacent to the roadway, a new alignment alternative was considered for this segment. This new alignment would bypass the existing intersection at Yontz Road and the railroad crossing to the right. This new alignment would accomplish a perpendicular crossing of the railroad, as well as displacement of the crossing from the existing rail switch. A rural typical section was considered for this new alignment.

The proposed rural alternative typical section, shown in **Exhibit 8.5**, is a four lane rural roadway with a 46-ft. median. This typical section consists of two 12-ft. lanes, 8-ft. outside shoulders (5-ft. paved) and 6-ft. inside shoulders (4-ft. paved) in each direction and a 12-ft. shared use path on the right (east) side. The minimum proposed right-of-way width required is 240 ft. The minimum proposed border width for this typical section is 40 ft.; however, a border width of 61 ft. is being proposed. The proposed wider than minimum border width matches the typical section that was developed for the project



# PROPOSED RURAL TYPICAL SECTION

(SEGMENTS 2a, 2b, 3 and 4)  
 Cobb Road (CR 485) / US 98 PD&E Study  
 WPI Segment Nos: 257299 1 & 405017 1  
 FAP Nos: 2891 007 P & 2891 008 P





(SPN 02100-1505, WPI No. 7119013) along US 98 from the Suncoast Parkway to US 19. This wider typical section was developed during a re-evaluation for that project once it was determined that the rolling terrain along this section of US 98 required a wider border width to connect to existing ground elevations. The design speed for this roadway is 70 mph.

This rural realignment alternative for Segment 1b was dismissed due to the number of parcels impacted, as well as the quantity of impacts to wetlands and the endangered plant species, Cooley's water willow (*Justicia cooleyi*). Furthermore, coordination with the CSX Railroad has proven beneficial in correcting early-perceived complications with the existing alignment, which alleviates the need for a new alignment.

### **8.3.5 Segment 2a**

The limits of Segment 2a are on Cobb Road from north of Yontz Road to south of US 98. The existing two-lane roadway is centered within the existing right-of-way, which varies from 120 to 150 ft. in width.

Five alternatives were initially developed for Segment 2a. Following the Public Workshop, one additional alternative was developed as a result of comments received. These alternatives involved three typical sections (suburban, rural and rural save-the-pavement) coupled with four different alignments (left, right, center and best-fit), as follows:

#### **8.3.5.1 Rural Typical Section**

The rural typical section proposed for Segment 2a is as described above in **Section 8.3.4.4** and shown in **Exhibit 8.5**. Four alignment alternatives were considered for this typical section:

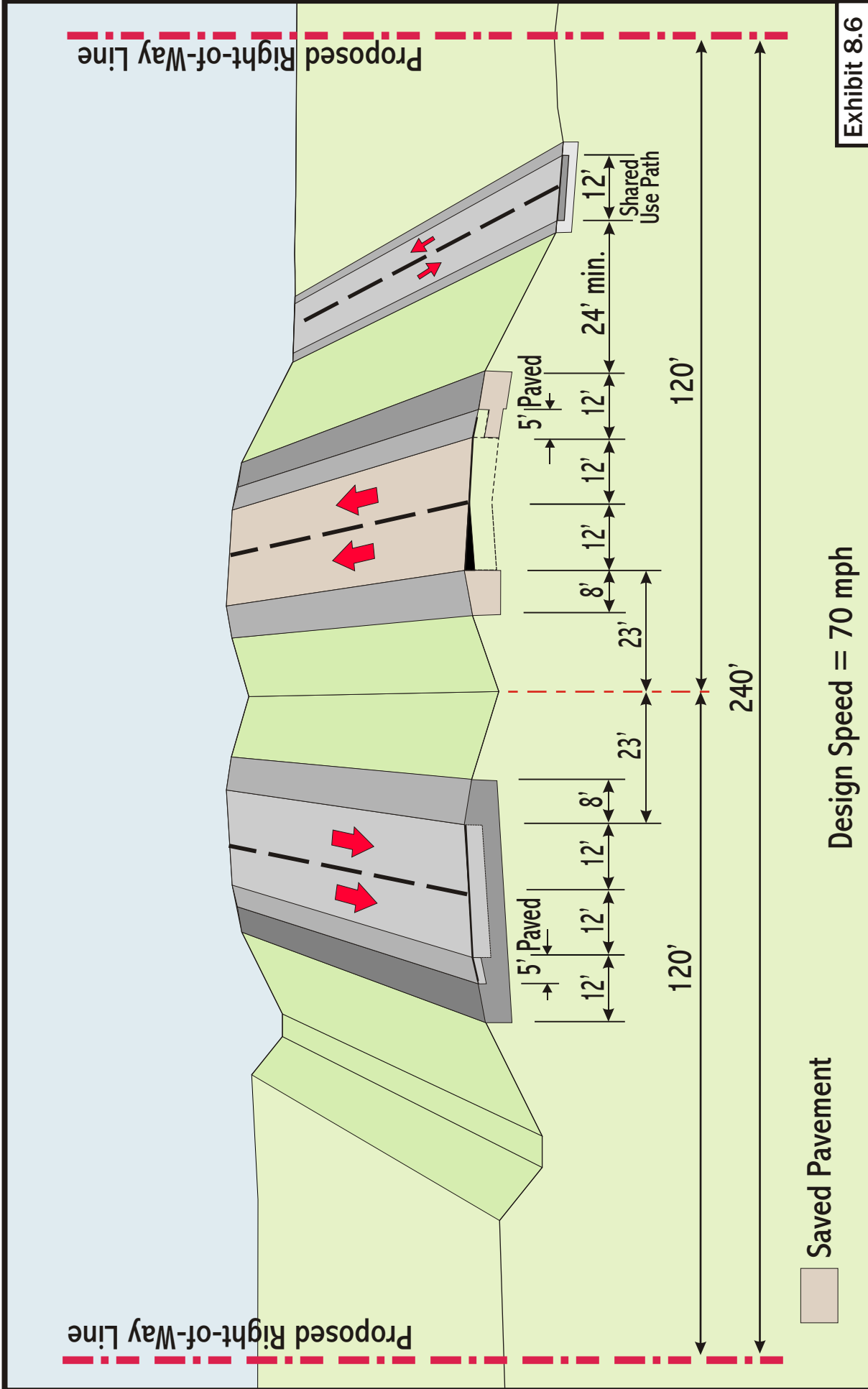
- Left Alignment: 110-120 ft. of additional right-of-way would be acquired from the left (west) side of the existing corridor. This is a **viable** alternative.

- Right Alignment: 100-120 ft. of additional right-of-way would be acquired from the right (east) side of the existing corridor. This alternative was dismissed due to the location of Wever Park on the east side of the existing corridor and the need to avoid impacts to this potential Section 4(f) site.
- Center Alignment: 50-60 ft. of additional right-of-way would be acquired from the left (west) side of the existing corridor and 40-60 ft. would be acquired from the right (east) side of the existing corridor. This alternative was dismissed due to the location of Wever Park on the east side of the existing corridor and the need to avoid impacts to this potential Section 4(f) site.
- Best-Fit Alignment: on average, 105 ft. of additional right-of-way width, would be acquired along the existing corridor. The side of the roadway from which right-of-way would be acquired would be varied and would be chosen based on existing features along the roadway in an attempt to avoid impacts. This is a **viable** alternative.

#### 8.3.5.2 Rural Save-the-Pavement Typical Section

The second typical section alternative for Segment 2a, shown in **Exhibit 8.6**, is a four-lane divided rural roadway, which is being developed as an approach to utilize the existing roadway as the proposed northbound lanes. This would require construction of the two (2) new southbound lanes to the left (west) of the existing roadway. This typical section consists of a four-lane rural roadway with a 46-ft. median and a 12-ft. shared use path to the right (east). There are two 12-ft. travel lanes, 12-ft. (5-ft. paved) outside shoulders and 8-ft. inside shoulders in each direction. The design speed for this roadway is 70 mph. The proposed right-of-way for this alternative is 240 ft. in width. One alignment alternative was considered for this typical section:

- Best-Fit Alignment: on average, 95 ft. of additional right-of-way width would be acquired from the left (west) side and 25 ft. from the right (east) side of the existing corridor, with the exception of the portion of the roadway adjacent to



# RURAL SAVE-THE-PAVEMENT ALTERNATIVE

(SEGMENTS 2a, 2b, 3 and 4)  
 Cobb Road (CR 485) / US 98 PD&E Study  
 WPI Segment Nos: 257299 1 & 405017 1  
 FAP Nos: 2891 007 P & 2891 008 P



Wever Park, where 120 ft. of additional right-of-way would be acquired from the left (west) side of the existing corridor. This is a **viable** alternative.

#### 8.3.5.3 Suburban Typical Section Transitioning to Rural Typical Section;

This alternative was developed in response to comments received from FDOT after the Public Workshop on June 13, 2002. This alternative addresses a desire to extend the suburban typical section described in **Section 8.3.3.3** and shown in **Exhibit 8.3**, to just north of Youth Drive, which services D.S. Parrott Middle School. The typical section would then transition to a rural typical section, as described in **Section 8.3.4.4** and shown in **Exhibit 8.5**. One alignment alternative was considered for this transitioning alternative:

- Left Alignment: on average, 33 ft. of additional right-of-way width would be acquired from the left (west) side between the Brooksville WRF driveway and Youth Drive. North of Youth Drive, a transition will take place to a rural typical section over the length of the curve at Wever Park. Ultimately, the transition will lead to a rural typical section where, on average, 120 ft. of additional right-of-way width would be acquired from the left (west) side of the existing corridor. This is a **viable** alternative.

#### 8.3.6 Segment 2b

The limits of Segment 2b are within 2000 ft. of each leg of the Cobb Road/US 98 'T'-intersection. The existing Cobb Road intersects US 98 at a 90° angle; however, one characteristic of the improvements associated with this project is the designation of Cobb Road as US 98 to bypass the City of Brooksville. Therefore, a new intersection alignment was evaluated to direct through traffic onto Cobb Road from northern US 98.

Four alternatives were initially developed for Segment 2b. These alternatives involved two typical sections (rural and rural save-the-pavement) coupled with one of three alignment alternatives, as follows:

#### 8.3.6.1 Rural Typical Section

The rural typical section proposed for Segment 2b is as described above in **Section 8.3.4.4** and shown in **Exhibit 8.5**. Three alignment alternatives were considered for this typical section:

- Rural Left ‘T’: 105 ft. of additional right-of-way width would be acquired from the left (west) side of the Cobb Road leg of the existing intersection and 40 ft. of additional right-of-way width would be acquired from the left (southwest) side of the US 98 portion of the existing intersection. This is a **viable** alternative.
- Rural Right ‘T’: 105 ft. of additional right-of-way width would be acquired from the right (east) side, along the Cobb Road leg of the existing intersection and 40 ft. of additional right-of-way width would be acquired from the right (northeast) side, along the US 98 portion of the existing intersection. This alternative was dismissed due to the inconsistency involved in the fact that the rural right alternative was dismissed for Segment 2a, as well as the greater number of parcels impacted for this alternative.
- Rural Realignment: 240 ft. of right-of-way width would be acquired in the southwest quadrant of the existing intersection in order to create a through movement between Cobb Road and US 98 to the north. Existing US 98 to the south would be realigned to a “T” intersection with the realigned Cobb Road. This is a **viable** alternative.

#### 8.3.6.2 Rural Save-the-Pavement Typical Section

The rural save-the-pavement typical section proposed for the Cobb Road leg of Segment 2b is as described above in **Section 8.3.5.2** and shown in **Exhibit 8.6**. One alignment alternative was considered for this typical section:

- Left Alignment: 95 ft. of additional right-of-way would be acquired from the left (west) side and 25 ft. from the right (east) side of the existing Cobb Road leg of the intersection. This is a **viable** alternative.

#### **8.3.7 Segments 3 and 4**

The limits of Segment 3 are US 98 from north of Cobb Road to CR 491. The limits of Segment 4 are US 98 from CR 491 to south of the Suncoast Parkway. The centerline of the existing two-lane roadway for both segments is offset 32 ft. south of the center of the existing 200 ft. of right-of-way. The existing centerline of construction is 68 ft. from the south right-of-way line, (see **Exhibit 4.3**). US 98 was divided into two segments (Segments 3 and 4) in order to be consistent with the limits of FDOT resurfacing projects, which were approaching construction at the time this report was under preparation. Alternatives being considered for these two segments are identical; therefore, they will be discussed only once.

Four alternatives were initially developed for each of Segments 3 and 4. These alternatives involved two typical sections (rural and rural save-the-pavement) coupled with three different alignments (left, right and center), as follows:

##### 8.3.7.1 Rural Typical Section

The rural typical section proposed for Segments 3 and 4 is as described above in **Section 8.3.4.4** and shown in **Exhibit 8.5**. Three alignment alternatives were considered for this typical section:

- Left Alignment: 40 ft. of additional right-of-way would be acquired from the left (south) side of the existing corridor. This is a **viable** alternative.
- Right Alignment: 40 ft. of additional right-of-way would be acquired from the right (north) side of the existing corridor. This alternative was dismissed due to the location of the Annutteliga Hammock and other conservation areas on the right side of the existing roadway, as well as greater amounts of potential 100-yr floodplain impacts as compared to the left alignment.
- Center Alignment: 20 ft. of additional right-of-way would be acquired from each side of the existing corridor. This alternative was dismissed due to the location of the Annutteliga Hammock and other conservation areas on the right side of the existing roadway, as well as greater amounts of potential 100-yr floodplain impacts as compared to the left alignment.

#### 8.3.7.2 Rural Save-the-Pavement Typical Section

The rural save-the-pavement typical section proposed for Segments 3 and 4 is as described above in **Section 8.3.5.2** and shown in **Exhibit 8.6**. One alignment alternative was considered for this typical section:

- Left Alignment: 17 ft. of additional right-of-way would be acquired from the left (south) side, and 23 ft. to the right (north) side of the existing 200 ft. of right-of-way. This alternative was dismissed due to the location of the Annutteliga Hammock and other conservation areas on the right side of the existing roadway, as well as deficiencies in the vertical curvature of the existing roadway.

### 8.4 VIABLE ALTERNATIVES

**Table 8.2** presents a matrix of alternatives which were chosen as **viable** based on their acceptance in **Section 8.3**. Long Range Estimate (LRE) construction costs shown in **Table 8.2** are based on year 2002 dollars. Costs for the over-build of the existing

Table 8.2 Viable Alternatives Evaluation Matrix

EVALUATION MEASURES	NO-BUILD	SEGMENT 1A				SEGMENT 1B			SEGMENT 2A				SEGMENT 2B			SEGMENT 3	SEGMENT 4
		URBAN	URBAN	SUBURBAN		URBAN	SUBURBAN		RURAL			SUBURBAN LEFT TRANSITIONING TO RURAL LEFT	RURAL			RURAL	RURAL
		LEFT	FIT WITHIN EXISTING R/W	LEFT	SAVE PAV'T	LEFT	LEFT	SAVE PAV'T	LEFT	BEST FIT	SAVE PAV'T		LEFT 'T'	SAVE PAV'T 'T'	REALIGN	LEFT	LEFT
<b>Engineering Factors</b>																	
Right-of-Way to be Acquired in Acres, including pond sites	0	4.47	3.092	5.75	5.94	14.02	16.69	15.89	36.27	36.35	36.75	26.87	7.84	6.35	14.39	43.17	28.71
Design Costs (millions of dollars) at 15% of construction costs	\$0.000	\$0.335	\$0.344	\$0.399	\$0.319	\$0.932	\$1.022	\$0.814	\$1.112	\$1.112	\$0.808	\$1.297	\$0.647	\$0.459	\$0.341	\$2.057	\$1.808
Right-of-Way Costs including ponds (millions of dollars)	\$0.000	\$2.413	\$0.769	\$2.615	\$2.669	\$1.448	\$1.676	\$1.948	\$2.460	\$2.769	\$2.923	\$1.316	\$0.826	\$1.107	\$1.769	\$5.192	\$2.686
Construction Costs (millions of dollars)* including 10% contingency costs	\$0.000	\$2.231	\$2.296	\$2.661	\$2.125	\$6.212	\$6.812	\$5.425	\$7.416	\$7.416	\$5.383	\$8.646	\$4.311	\$3.061	\$2.274	\$13.712	\$12.056
Construction Engineering & Inspection Costs (millions of dollars) at 17.5% of construction costs	\$0.000	\$0.390	\$0.402	\$0.466	\$0.372	\$1.087	\$1.192	\$0.949	\$1.298	\$1.298	\$0.942	\$1.513	\$0.754	\$0.536	\$0.398	\$2.400	\$2.110
Wetland Mitigation Costs (millions of dollars) (FS 373.4137; 2002-'03 figures; \$83,598.00/ac)	\$0.000	\$0.014	\$0.000	\$0.030	\$0.032	\$0.005	\$0.007	\$0.008	\$0.244	\$0.231	\$0.234	\$0.232	\$0.007	\$0.001	\$0.015	\$0.012	\$0.047
<b>Total Project Cost (millions of dollars)</b>	<b>\$0.000</b>	<b>\$5.383</b>	<b>\$3.811</b>	<b>\$6.171</b>	<b>\$5.517</b>	<b>\$9.684</b>	<b>\$10.709</b>	<b>\$9.144</b>	<b>\$12.530</b>	<b>\$12.826</b>	<b>\$10.290</b>	<b>\$13.003</b>	<b>\$6.545</b>	<b>\$5.164</b>	<b>\$4.797</b>	<b>\$23.371</b>	<b>\$18.707</b>
<b>Social and Cultural Effects</b>																	
Residential Relocations	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Businesses Affected (Damages)	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	2	1
Business Relocations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Parcels Affected	0	14	1	14	14	6	6	6	8	11	13	7	8	9	11	40	22
Outdoor Advertising Sign Displacements	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Churches	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cemeteries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Schools/Day Care Facilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Medical Facilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Section 4(f) / Public Parks Affected Area (acres)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Historical / Archaeological Sites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Public Services (fire stations, etc.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Natural Environment Effects</b>																	
Wetland Area in Acres	0	0.16	0.00	0.36	0.39	0.06	0.08	0.09	2.92	2.76	2.80	2.77	0.08	0.01	0.18	0.14	0.56
100-Year Floodplain Area in Acres	0	0.1	0.07	0.2	0.2	0	0	0	0	0	0	0	0	0	0	0	0.16
Threatened & Endangered Species (0=No habitat to be affected, 1=affected habitat)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Physical Environment Effects</b>																	
Air Quality Effects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Potential Contamination Sites (0=No potential contamination site affected, 1=ROW to be acquired from potentially contaminated property)	0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	1
Noise Sites Affected	0	11	14	11	11	2	2	2	1	1	1	0	0	0	0	3	2

\* Costs based on concrete pavement

Recommended Alternative



pavement for the Save-the-Pavement Alternatives were included. A 17.5% construction engineering and inspection cost and 15% design cost were added for each alternative.

## 8.5 RECOMMENDED ALTERNATIVE

The Recommended Alternative was developed from analysis of the viable alternatives evaluation matrix (**Table 8.2**) in conjunction with consideration of public comments received after the Public Workshop. The Recommended Alternative for the project consists of a compilation of recommended alternatives for each segment. Rationale used to dismiss alternatives and arrive at a chosen recommended alternative for each segment is described as follows:

- **Segment 1a:** The recommended alternative for Segment 1a is the Urban (non-expandable) alternative, which fits within the existing right-of-way with the exception of a small clip in the northwest quadrant of the intersection at Shadyside Drive. This alternative was chosen due to minimal impacts associated with minimal right-of-way acquisition and based on the following rationale:
  - **Justification** – The Urban Left (expandable) alternative is not justified since projected traffic volumes do not warrant six-laning by or shortly after the project’s design year. The Suburban Left alternative is not justified based upon LRTP needs for future expandability to six lanes or the potential for initially higher speeds. The additional right-of-way acquisition associated with these alternatives is not justified.
  - **Cost** – The Suburban Save-the-Pavement option was dismissed due to additional costs associated with future construction. Although initial estimated costs for the save-the-pavement option (\$5.517 million) are less than the suburban left (\$6.171 million) alternative, when the cost of the replacement of the existing asphalt with concrete in the future is considered, the save-the-pavement option is a more costly alternative in the long run. This is particularly emphasized in light of the heavy truck volumes along the project corridor. The life span of the existing asphalt is

significantly shorter as compared to typical roadways with lower volumes of truck traffic. Therefore, the limited extended use of the existing pavement does not warrant the overall costs associated with the save-the-pavement option.

- **Segment 1b:** The recommended alternative for Segment 1b is the Suburban Left alternative. This alternative was chosen based on the following rationale:
  - **Land Use** – the suburban typical section provides a more context-sensitive design than the urban typical section. The surrounding land use in this segment can be characterized as rural transitioning to urban. A suburban typical section is a better fit for the surrounding land use, both in terms of functionality and aesthetics.
  - **Safety** – results of the speed study (refer to **Section 4.1.13**, **Table 4.4**) conducted on August 26, 2002 indicate the 85<sup>th</sup> percentile operating speed to be 56 mph in this segment. Given this relatively high operating speed and associated safety issues, a suburban typical section is preferred over the urban typical section. The suburban typical section provides a width of approximately 25 feet between the outside edge of travel lane and the shared use path, whereas the urban typical section provides a width of only 4 feet. The added buffer associated with the suburban typical section alternative separates pedestrians and bicyclists from motorized vehicles (particularly heavy truck traffic) and, therefore, provides enhanced safety for all users. Safety is a key factor with this project as it relates to heavy volumes of truck traffic and a main goal of the project is to enhance safety. The suburban typical section satisfies this goal.
  - **Purpose** – Every transportation project should be developed to ensure maintainability. The proposed use of concrete versus asphalt pavement for this project should reduce resurfacing requirements. Historically, maintenance of the existing asphalt pavement on Cobb Road has incurred significant costs due to the heavy volume of truck traffic and associated rapid asphalt deterioration. In addition to the use of concrete versus

asphalt, the suburban typical section also enhances maintainability through the use of shoulders and ditches rather than curb and gutter. With any roadway design, the potential for unexpected off-road movements exists. These off-road movements are particularly significant in terms of heavy truck traffic. A suburban typical section would minimize maintenance since destruction of curb and gutter would not occur with off-road movements.

- **Segment 2a:** The recommended alternative for Segment 2a is the Suburban Left transitioning to Rural Left alternative. This alternative was chosen based on the following rationale:
  - **Cost** – The save-the-pavement option was dismissed due to additional costs associated with future construction. Although initial estimated costs for the save-the-pavement option (\$10.290 million) are less than the rural left (\$12.530 million), rural best fit (\$12.826 million) and suburban transitioning to rural (\$13.003 million) alternatives, additional costs including the replacement of the existing asphalt with concrete in the future prove the save-the-pavement option to be a more costly alternative in the long run. This is particularly emphasized in terms of the heavy truck volumes along the project corridor. The life span of the existing asphalt is significantly shorter as compared to typical roadways with lower volumes of truck traffic. Therefore, the limited extended use of the existing pavement does not warrant the overall costs associated with the save-the-pavement option.
  - **Land Use/Functionality** – The recommended alternative for this segment utilizes a suburban typical section with a left alignment south of Youth Drive. North of Youth Drive, a transition to a rural typical section with a left alignment is proposed. A rural typical section south of Youth Drive within this segment was not preferred due to the surrounding land use, which can be characterized as rural transitioning to urban. The suburban typical section provides a more context-sensitive design than the rural

typical section. A suburban typical section is a better fit for the surrounding land use, both in terms of functionality and aesthetics.

- **Segment 2b:** The recommended alternative for Segment 2b is the Rural Realign alternative. This alternative was chosen based on the following rationale:
  - **Purpose** – The designation of the existing Cobb Road as US 98 is a goal set forth in the Hernando County MPO Long Range Transportation Plan<sup>1</sup>. The primary purpose of this goal was to implement a bypass around the City of Brooksville, which would create a through movement for regional traffic and enhance safety, particularly for heavy truck traffic. In order to create this through movement between existing Cobb Road and US 98 to the north, a realignment at the Cobb Road / US 98 intersection is essential.
  
- **Segments 3 and 4:** The recommended alternative for Segments 3 and 4 is the Rural Left alternative. This was the only viable alternative for each of these segments. Other alignment alternatives were dismissed in the preliminary screening process due to potential Section 4(f) involvement.

In summary, the Recommended Alternative for this PD&E Study is a four-lane divided facility consisting of the following typical sections and alignments. From SR 50 to the Brooksville WRF driveway, an urban typical section will be utilized. This typical section is designed to generally fit within the existing right-of-way with the exception of a small clip from the northwest quadrant of the Shadyside Drive intersection. North of the Brooksville WRF driveway, the proposed roadway transitions to a suburban typical section with a left alignment. North of Youth Drive, the proposed roadway transitions to a rural typical section with a left alignment. A realignment (rural typical section) is proposed in the southwest quadrant of the existing Cobb Road / US 98 intersection, which will provide a through movement between existing Cobb Road (future US 98 designation) and existing US 98 to the north. A rural typical section with a left alignment is proposed for the remainder of the project limits along US 98.

## 8.6 REFERENCES

1. Hernando County MPO *2025 Long Range Transportation Plan*; Hernando County, Florida; 2002.

## 9.0 PRELIMINARY DESIGN ANALYSIS

### 9.1 DESIGN TRAFFIC VOLUMES

The annual average daily and directional design hour traffic volumes, AADT and DDHV respectively, were discussed previously in **Section 6.0** of this report. Based on the DDHV and after consideration of the existing turning movements and the impact to future developments on traffic flow, design hour traffic volumes were developed for the signalized and major unsignalized intersections along the project. **Exhibits 6.4, 6.5** and **6.6** depict traffic volumes for the Recommended Build condition.

### 9.2 TYPICAL SECTIONS

#### 9.2.1 Proposed Urban Typical Section

The proposed typical section for Segment 1a is an urban typical section (see **Exhibit 8.2**) consisting of two 12-ft. travel lanes in each direction, a 6-ft. sidewalk on the left (west) side and a 12-ft. shared use path on the right (east) side. This typical section utilizes a 17.5-ft. median and fits within the existing right-of-way width (minimum 100 ft.). The proposed design speed is 45 mph.

#### 9.2.2 Proposed Suburban Typical Section

The proposed typical section for Segment 1b and for the portion of Segment 2a south of Youth Drive is a suburban typical section (see **Exhibit 8.3**) consisting of two 12-ft. travel lanes in each direction with 8-ft. outside shoulders (5 ft. paved) and a 12-ft. shared use path on the right (east) side. This typical section utilizes a 30-ft. median (22-ft. curb to curb and 4-ft. offsets to edge of inside travel lanes). The proposed design speed is 55 mph.

### 9.2.3 Proposed Rural Typical Section

The proposed typical section for Segment 2a north of Youth Drive and Segments 2b, 3 and 4 is a rural typical section (see **Exhibit 8.5**) consisting of two 12-ft. travel lanes, 8-ft. outside shoulders (5-ft. paved) and 6-ft. inside shoulders (4-ft. paved) in each direction and a 12-ft. shared use path on the right (east) side. The proposed design speed is 70 mph.

## 9.3 INTERSECTION CONCEPTS AND SIGNAL ANALYSIS

The *Traffic Report*<sup>1</sup> (April 2003) prepared as part of this PD&E Study illustrates the recommended intersection lane geometry, and provides detailed information about the operation of each signalized intersection.

## 9.4 ALIGNMENT AND RIGHT-OF-WAY

The Recommended Alternative alignment was developed to avoid or minimize impacts to the surrounding land uses and environmental features. The proposed urban typical section for Segment 1a fits within the existing right-of-way with the exception of a small parcel clip from the northwest quadrant of the Shadyside Drive intersection. A left alignment was chosen for the remainder of the project. On average, approximately 38 feet of additional right-of-way width will be required for Segment 1b. Additional right-of-way width required in Segment 2a will include a minimum of 23 ft. in the suburban section to a maximum of 105 ft. in the rural section. The re-alignment in Segment 2b will require 240 feet of right-of-way width. Segments 3 and 4 will require 40 feet of additional right-of-way width.

## 9.5 RELOCATIONS

The potential for relocations as a result of the planned project are relatively minor. There are no residential relocations and two business relocations as a result of the Recommended Alternative.

## 9.6 RIGHT-OF-WAY COSTS

Preliminary costs for right-of-way acquisition were estimated at \$13.408 million. This cost includes right-of-way for the roadway, as well as for stormwater management facilities; administrative and legal fees; support costs; severance and business damages; and relocation costs. **Table 9.1** shows the estimated right-of-way costs for each segment.

**Table 9.1 Estimated Costs for Recommended Alternative**

Segment	COSTS (millions of dollars)					
	R/W	Construction	Design	CEI	Wetland Mitigation	Total
1a	\$0.769	\$2.296	\$0.344	\$0.402	\$0.000	\$3.811
1b	\$1.676	\$6.812	\$1.022	\$1.192	\$0.007	\$10.709
2a	\$1.316	\$8.646	\$1.297	\$1.513	\$0.232	\$13.003
2b	\$1.769	\$2.274	\$0.341	\$0.398	\$0.015	\$4.797
3	\$5.192	\$13.712	\$2.057	\$2.400	\$0.012	\$23.371
4	\$2.686	\$12.056	\$1.808	\$2.110	\$0.047	\$18.707
<b>TOTAL</b>	<b>\$13.408</b>	<b>\$45.795</b>	<b>\$6.869</b>	<b>\$8.014</b>	<b>\$0.311</b>	<b>\$74.398</b>

## 9.7 CONSTRUCTION COSTS

Construction costs were calculated using FDOT's Long Range Estimates (LRE) computer program method. **Table 9.1** shows the estimated construction costs for the



Recommended Alternative. The estimated total construction cost for the roadway construction is \$ 45.795 million. The estimated costs were generated using 2002 dollars.

## **9.8 PRELIMINARY DESIGN AND CONSTRUCTION ENGINEERING COSTS**

The cost of design was estimated as 15% of the construction costs. The cost of Construction, Engineering and Inspection (CEI) was estimated as 17.5 % of construction costs. Therefore, these efforts are expected to cost approximately \$6.869 million for design and \$8.014 million for CEI, for a total of \$14.883 million (see **Table 9.1**).

## **9.9 RECYCLING OF SALVAGEABLE MATERIALS**

During construction of the project, recycling of re-usable materials will occur to the greatest extent possible. Where possible, removal and recycling of the existing pavement for use in the new pavement will be considered. This will help to reduce the volume of materials that need to be hauled and disposed of away from the project and to reduce the cost of purchasing materials suitable for pavement construction. Other materials such as signs, drainage concrete pipes, etc., will be salvaged and re-used for regular maintenance operations if they are found to be in good condition.

## **9.10 USER BENEFITS**

The public will realize numerous benefits after the Recommended Alternative is constructed. Savings in travel time, increased roadway safety, reduced vehicle operating costs, reduced traffic accident-related costs, reduced congestion in urban Brooksville, and reduced emergency response times are the main benefits. Access to schools and community facilities, as well as the numerous commercial establishments and residences will be enhanced. The creation of a motorist-friendly facility will contribute to the economic growth of the area adjacent to the project.

### 9.11 PEDESTRIAN AND BICYCLE FACILITIES

The Recommended Alternative includes a shared use path (12' wide) on the right (east) side for the entire length of the project. This path will accommodate pedestrians and bicyclists for transportation, as well as recreational purposes. Additionally, a six foot sidewalk is proposed on the left (west) side between Shadyside Drive and Fort Dade Avenue, which ties into the existing sidewalk to the south.

Facilities such as crosswalks and public sidewalk curb ramps at intersections will be designed to meet the Americans with Disabilities Act (ADA).

### 9.12 SAFETY

The proposed improvements will upgrade Cobb Road to a safer and more efficient transportation facility. The increased capacity is expected to result in less congestion and therefore, reduce the probability for accidents. Because the improvements will provide for increased and improved travel lanes for trucks along US 98, vehicular safety will increase overall by relieving truck congestion within the urban areas and providing a bypass for trucks around urban Brooksville. The design and alignment of the roadway will meet applicable safety standards. Adherence to design speed as it applies to establishing and setting minimum values on critical roadway design features will be accomplished. Roadway design elements including curvature, sight distance, width and clearance will meet the applicable minimum roadway design standards. Access control techniques to promote safe and efficient traffic circulation will also be employed.

### 9.13 ECONOMIC AND COMMUNITY DEVELOPMENT

The *Hernando County Comprehensive Plan*<sup>2</sup> and the Hernando County MPO *2025 Long Range Transportation Plan*<sup>3</sup> (LRTP) calls for the improvements on Cobb Road and US 98. These plans were developed after thorough evaluation of the future population and development growth in the region of the project. The proposed Cobb Road

improvements developed through the process previously described in **Section 8.0** will fully accommodate the projected year 2025 traffic demand to the maximum extent feasible. Expected future growth in the area will be guided by the governing land use plans developed by Hernando County. The proposed improvements are not expected to change existing land use.

## **9.14 ENVIRONMENTAL EFFECTS**

### **9.14.1 Land Use Data**

#### 9.14.1.1 Community Facilities and Established Land Uses

Community facilities provide a focal point for adjacent neighborhoods and communities, as well as serving the needs of the surrounding areas. No disruption of community services is expected, and land use is not expected to change as a result of the improvements. Community services and access to the same is expected to improve as a result of the planned project. The improvements are consistent with future land use plans, and future land uses are expected to follow the established trends.

#### 9.14.1.2 Community Cohesion

The project involves the widening of the existing two-lane facility with minimal right-of-way acquisition. No neighborhoods or subdivisions will be split or divided and no ethnic groups or minorities will be isolated. The project will not negatively affect elderly persons, handicapped individuals, non-drivers, and transit dependent individuals. It is not anticipated that the proposed improvements will impact community cohesion.

The proposed improvements will comply with Executive Order 12898, Environmental Justice, issued on February 11, 1994. The improvements are considered to have no effect on community cohesion.

9.14.1.3      Cultural Features

A *Cultural Resources Assessment Survey*<sup>4</sup> (*CRAS*) has been prepared as part of this PD&E Study. The findings of the *CRAS* are incorporated by reference into this *PER*.

9.14.1.4      Wetland Impact and Mitigation

A *Wetland Evaluation Report*<sup>5</sup> (*WER*) has been prepared as part of this PD&E Study. The findings of the *WER* are incorporated by reference into this *PER*.

9.14.1.5      Threatened and Endangered Species

A *Threatened and Endangered Species Biological Assessment*<sup>6</sup> (*TESBA*) has been prepared as part of this PD&E Study. The findings of the *TESBA* are incorporated by reference into this *PER*.

9.14.1.6      Potential Hazardous Materials and Petroleum Contaminated Sites

A *Contamination Screening Evaluation Report*<sup>7</sup> (*CSER*) has been prepared as part of this PD&E Study. The findings of the *CSER* are incorporated by reference into this *PER*.

9.14.1.7      Noise Impacts

A *Noise Study Report*<sup>8</sup> (*NSR*) has been prepared as part of this PD&E Study. The findings of the *NSR* are incorporated by reference into this *PER*.

9.14.1.8      Air Quality Impacts

An *Air Quality Report*<sup>9</sup> (*AQR*) has been prepared as part of this PD&E Study. The findings of the *AQR* are incorporated by reference into this *PER*.

#### 9.14.1.9 Water Quality

No adverse impacts to water quality are expected. The proposed stormwater facility design will include at a minimum, the water quality criteria as required by the Southwest Florida Water Management District (SWFWMD) in Florida Statutes 373 and Rules 40E-1, 40E-4, 40E-40 Florida Administrative Code. Therefore, no further mitigation for water quality impacts will be needed. A *Water Quality Impact Evaluation*<sup>10</sup> (*WQIE*) has been prepared as part of this PD&E Study. The findings of the *WQIE* are incorporated by reference into this *PER*.

The impacts of the planned project on the surface water will essentially be limited to the effects of erosion during construction. These impacts are considered temporary and will be minimized by strict adherence to Section 104 of the FDOT *Standard Specifications for Road and Bridge Construction*<sup>11</sup> (latest edition).

#### 9.14.1.10 Aquatic Preserves and Outstanding Florida Waters

There are no Aquatic Preserves or Outstanding Florida Waters within the project limits.

#### 9.14.1.11 Section 4 (f) Lands

There are four potential Section 4(f) properties along the planned project: 1) Wever Park, 2) a historic school/cannery (FMSF No. 8HE447), 3) a parcel of the Annutteliga Hammock (a state-owned CARL purchase) located west of CR 491, and 4) another parcel within the Annutteliga Hammock located south of Lake Lindsey Road. In accordance with Section 4(f) of the DOT Act of 1966 (Title 49, U.S.C., Section 1653(f), amended and recodified in Title 49, U.S.C., Section 303, in 1983), the project was examined for possible involvement with Section 4(f) properties. The planned project would not require the acquisition of any right-of-way from these potential Section 4(f) protected properties as indicated on the concept plans included in Appendix B (Sheets 6, 7, 11, 19 and 20). Additionally, the planned project would not substantially impair the activities, features, or attributes that qualify the Section 4(f) property for protection.

9.14.1.12 Floodplains

A *Location Hydraulic Report*<sup>12</sup> (*LHR*) has been prepared as part of this PD&E Study. The findings of the *LHR* are incorporated by reference into this *PER*.

**9.15 UTILITY IMPACTS**

There are utility providers along the project corridor that would be impacted by the Recommended Alternative. The utilities providers along with the estimated relocation costs are listed below:

- |                              |             |
|------------------------------|-------------|
| • Time Warner Communications | \$30, 000   |
| • Bell South                 | \$500, 000  |
| • City of Brooksville        | \$2,186,600 |
| • Williams Communications    | \$1,729,800 |

A response from Florida Power Corporation revealed that there are no utility conflicts with the planned project. A response was not received from Withlacoochee River Electric Cooperative concerning known utilities within the project limits.

**9.16 TRAFFIC CONTROL PLAN**

Maintenance of traffic and the sequence of construction will be planned so as to minimize impacts to the traveling public. One lane of traffic in each direction will be maintained at all times. During final design, a Traffic Control Plan will be developed and approved for use, in accordance with FDOT Design Standards. Access to adjacent properties will be maintained.

The following conceptual construction sequence will help maintain traffic operations along Cobb Road and US 98 during construction:

- Relocate existing utilities within the right-of-way.
- Construct stormwater ponds.
- Construct the ultimate southbound roadway while maintaining traffic on the existing pavement.
- Temporarily operate two-way traffic on the completed ultimate southbound lanes, while constructing the ultimate northbound travel lanes.
- Shift northbound and southbound lanes to their respective and completed roadways.

### **9.17 RESULTS OF PUBLIC INVOLVEMENT PROGRAM**

A public involvement program was approved for the study in August 2001. The program documented the techniques to be used to inform and solicit comments from interested parties, including local residents, public officials, agency representatives, and business owners. The techniques documented in the program included distribution of an “Advance Notification Package,” an officials “Kickoff Meeting,” a public information workshop, and a public hearing. The results of these activities are documented in the study’s *Comments and Coordination Report*<sup>13</sup>, a brief summary of which appears below.

#### **9.17.1 Advance Notification**

An Advance Notification Package was prepared for the study in accordance with Part 1, Chapter 2 of the FDOT PD&E Manual and was transmitted to the Florida State Clearinghouse (Governor’s Office of Planning and Budgeting) on August 6, 2001. Most agencies responded with no comments. Those who did provide comments included the Florida Department of Environmental Protection, the Southwest Florida Water Management District, the Florida Department of Community Affairs, and the Withlacoochee Regional Planning Council.

These agencies’ comments generally indicated no anticipated negative effects or consistency with applicable policies or requirements. Others requested that standard

protective measures be taken to protect the environment or that further coordination take place with agencies during the project's final engineering design phase. More detail on these agency responses can be found in the study's *Comments and Coordination Report*<sup>13</sup>.

### **9.17.2 Officials Kickoff Meeting**

An Elected Official/Agency Kickoff Meeting was held on August 29, 2001 at the Lykes Memorial Library in Brooksville from 10:00 AM to noon. The purpose of the meeting was to apprise area elected and appointed officials of the project's purpose and schedule, and to receive input from them on issues and concerns related to the proposed improvements. The meeting format was informal and did not include a presentation or formal statements; instead, questions were answered and information obtained through one-on-one discussions. Most comments were generally favorable towards the need to widen Cobb Road and convert it to US 98 as part of an overall plan to bypass the central Brooksville area. The primary purpose of the bypass is to divert heavy truck traffic from the Brooksville central business district. It was noted that some small businesses in the downtown area may not like this, but the community overall was very supportive of the concept.

### **9.17.3 Public Workshop**

A public workshop was held for the study on Thursday, June 13, 2002, from 4:30 PM to 7:30 PM at Dolores S. Parrott Middle School, 9220 Youth Drive, in Brooksville.

Approximately 43 individuals signed the attendance record. The format of the workshop was informal, with displays available for review and a comment box submittal of written comments. A project audio-visual presentation ran continuously over the course of the workshop. FDOT representatives were available to answer questions and receive verbal comments. The study's *Draft Preliminary Engineering Report* was available for review at the workshop.



Fourteen comment forms were received at the workshop or in the mail following the workshop regarding the planned project alternatives presented. These comments primarily involved four issues: support for the project, access management, safety, and the proposed shared use path.

- **Support for the Project** – In general, comments received showed overall support for the project. A multi-lane truck bypass facility to route rock haulers and other heavy trucks around Brooksville has been a key element of local comprehensive and transportation plans for many years.
  
- **Access Management** – Conversion of the existing two-lane facility to a four-lane divided highway and designation of Cobb Road as part of the federal-state system requires changes in access management. Consequently, various comments were received at the public workshop concerning access management, particularly in reference to the directional median opening proposed at Fort Dade Avenue. An access management coordination meeting was held with the FDOT-D7 Median Review Committee on February 21, 2002 to coordinate the access classification, median locations and median types to be used in the development of alternatives for the planned project. During this meeting, it was determined that the project should be developed in accordance with Access Class 3 criteria. Therefore, all median opening types and locations were derived from the rules and regulations according to Access Class 3. Median opening types and locations were approved by the Median Review Committee in February 2002.
  
- **Safety** – Various comments were received concerning safety issues with the planned project. In general, support for the project was expressed in terms of enhancing the safety of the existing hazardous roadway.
  
- **Shared Use Path** – Several inquiries were made as to the rationale behind implementation of a shared use path in the project design. This 12-foot wide path was incorporated into the proposed alternatives to accommodate bicyclists and

pedestrians. FDOT policy requires the accommodation of bicyclists in all new roadway projects. This is usually accomplished in one of two ways: for an urban typical section, an additional 4-foot outside lane is provided adjacent to motor vehicle lanes and designated for bicyclists via pavement markings; for a suburban or rural typical section, bicycles are accommodated on the paved outside shoulders. A separate multi-use trail is another way to accommodate bicyclists and pedestrians if conditions warrant. Due to the safety factors associated with heavy truck volumes along this corridor, a shared use path was chosen as the preferred facility for bicyclists and pedestrians. Furthermore, implementation of a designated bike trail along Cobb Road and US 98 is identified in the Hernando County MPO 2025 *L RTP*<sup>3</sup> with connections to shared use paths along SR 50 and the Suncoast Parkway. A right alignment was chosen for the path due to the location of the D.S. Parrott Middle School, Wever Park and Annutteliga Hammock sites on the right side of the corridor.

#### **9.17.4 Public Hearing**

The Public Hearing for the planned project was held on November 21, 2002, at Dolores S. Parrott Middle School, 9220 Youth Drive, in Brooksville. An informal open house period took place from 4:30 PM until 7:30 PM, with a formal presentation given at 6:00 PM. A newsletter announcing the meeting and describing the project was prepared and distributed 21 days prior to the Hearing to elected officials, agencies, and property owners within 300 feet of the centerline of the recommended alternative through the length of the project.

The purpose of the Hearing was to provide the public with specific information regarding the study's recommended alternative. The hearing also provided an opportunity for area property owners and other residents to express their views on the project, its potential for impact, and other related matters. The public record for the Hearing remained open until December 2, 2002. A transcript was prepared to officially document all proceedings and citizen comments.

Excluding FDOT personnel, 42 individuals signed the attendance register. Copies of the Hearing notification materials, sign-in sheets, handout materials, evaluation matrix, and transcript may be found in Appendix E of the *Comments and Coordination Report*<sup>13</sup>. Specific questions and comments raised at the Hearing were answered during informal discussions, by letter, or are answered in the *Comments and Coordination Report*<sup>13</sup>. Five written comment forms or letters were received and six official statements were made for the record. Informal comments were also made over the course of the Hearing. While some of the comments made at the Hearing and in the letters and comment forms received following it were of a general nature, the following summarizes the substantive comments made:

Comment: The proposed design of driveway connections at the Cobb Road-US 98 intersection is inadequate and will negatively affect the values and potential uses of affected properties.

Response: The Department of Transportation must re-establish any driveway connections that were disrupted or altered as a result of a roadway project. No access is being eliminated at the Cobb Road-US 98 intersection that will not be replaced. The final disposition of rights-of-way and frontage would be determined during the right-of-way acquisition stage of the project.

Comment: The project will exacerbate existing drainage problems at the Cobb Road-US 98 intersection. Standard retention ponds may not control runoff from the highway.

Response: A detailed drainage analysis was conducted as part of the PD&E study, indicating the measures to be taken to ensure the project does not contribute to any existing drainage problems.

Comment: It is of concern that Brittle Road is to be paved one-half mile in each direction from its intersection with US 98 when the road simply leads to an abandoned mine.

Response: The proposed paving of a portion of Brittle Road is not due to mining operations but, rather, because Brittle Road is a public right-of-way.

Comment: The proposed raised median at the intersection of Fort Dade Avenue and Cobb Road will cause difficulties for area residents traveling on Fort Dade and will negatively impact the retail gas station at the northeast corner of the intersection.

Response: The partial median opening proposed at this intersection is in keeping with adopted access management standards. With Cobb Road being converted into a US route (which is one of the main reasons for the project), more stringent access controls are necessary.

Comment: The acceleration lane on southbound Cobb Road at the Yontz Road intersection is inadequate.

Response: The design of this intersection would be further examined in during the Design Phase of the project.

Comment: Why will certain intersections be realigned and not others?

Response: The proposed realignment of the Brittle Road intersection is to eliminate a severe skew in the angle at which this road crosses US 98. The severity of the existing skew makes development of a safe intersection difficult without a realignment.

Comment: A sound barrier wall should be installed along Cobb Road to buffer the noise generated by increased truck traffic.

Response: A detailed noise analysis was conducted as part of this Project Development and Environment Study. The analysis revealed there are no feasible noise abatement measures as discussed in the *NSR*.

Comment: US 98 should use the suburban typical cross-section, which is 150 feet wide, rather than the rural typical cross-section, which is 240 feet wide. The 240-foot road would exceed the needs of the area. In addition, to improve safety, a traffic signal should be installed at the intersection of 491 and US 98.

Response: Roadway and land use conditions along US 98 warrant a facility that allows for safe accommodation of high speed traffic. The rural typical cross section is the preferred choice in this area. At the present time the traffic volumes using this intersection do not meet the criteria for installation of a traffic light. This issue may be further examined during the design phase of the project.

Comment: Shared use path will be rendered unsafe where driveways cross the path to access Cobb Road. This is a particular problem because trucks carrying heavy equipment and machinery must access businesses along Cobb Road via these driveways.

Response: The rules governing the proposed shared use path would be no different than those governing normal sidewalks. Given the high volume of rock hauling trucks on Cobb Road itself, a separate path that provides the required accommodation of bicyclists and pedestrians will be safer than the option of forcing bicyclists onto the roadway itself.

## 9.18 VALUE ENGINEERING

The Cobb Road / US 98 Recommended “Build” Alternative was reviewed by a Value Engineering (VE) Review team formed by FDOT staff. The review was performed from October 21 to October 25, 2002. A *Value Engineering Study*<sup>14</sup> has been prepared as part of this PD&E Study. The findings of the *Value Engineering Study*<sup>14</sup> are incorporated by reference into this *PER*. Refer to **Appendix C** for the recommendation and course of action.

## 9.19 DRAINAGE

A *LHR*<sup>12</sup> and an *Alternative Pond Sites Report*<sup>15</sup> (*PSR*) have been prepared as part of this PD&E Study. The findings of the *LHR* and the *PSR* are incorporated by reference into this *PER*.

## 9.20 STRUCTURES

There are no existing or proposed structures associated with this PD&E Study.

## 9.21 ACCESS MANAGEMENT

An Access Management Plan was developed for the proposed improvements. Details regarding access management for this project are described in **Section 6.8**. An Access Class Reclassification Hearing will be held during the design phase.

## 9.22 AESTHETICS AND LANDSCAPING

The placement and maintenance of any landscaping shall comply with the required clear zone and sight distance at intersections and access points. No other provisions or commitments were made regarding special aesthetic features.

## 9.23 REFERENCES

1. *Traffic Report*; H.W. Lochner, Inc.; April 2003.
2. *Hernando County Comprehensive Plan*; Hernando County Board of County Commissioners; Adopted June 1989 and as amended.
3. *Hernando County MPO 2025 Long Range Transportation Plan*; Hernando County, Florida; 2002.
4. *Cultural Resources Assessment Survey (CRAS)*; Archaeological Consultants, Inc.; April 2003.
5. *Wetlands Evaluation Report (WER)*; H.W. Lochner, Inc.; April 2003.
6. *Threatened and Endangered Species Biological Assessment (TESBA)*; H.W. Lochner, Inc.; April 2003.
7. *Contamination Screening Evaluation Report (CSER)*; Quest Ecology; April 2003.
8. *Noise Study Report (NSR)*; H.W. Lochner, Inc.; April 2003.
9. *Air Quality Report (AQR)*; H.W. Lochner, Inc.; April 2003.
10. *Water Quality Impact Evaluation (WQIE)*; H.W. Lochner, Inc.; September 2002.
11. *FDOT Standard Specifications for Road and Bridge Construction*; latest edition.
12. *Location Hydraulics Report (LHR)*; H.W. Lochner, Inc.; April 2003.
13. *Comments and Coordination Report*; H.W. Lochner, Inc.; April 2003.
14. *Value Engineering Study*; Ventry Engineering, L.L.C.; October 2002.
15. *Alternative Pond Sites Report (PSR)*; H.W. Lochner, Inc.; April 2003.

**APPENDIX A  
Eastern Indigo Snake Protection Plan**



## Eastern Indigo Snake Standard Protection Procedures

The Eastern indigo snake is a threatened species that occurs throughout peninsular Florida. This species is actually characteristic of moist habitats, but inhabits sandy xeric habitats in conjunction with gopher tortoises (*Gopherus polyphemus*). In the drier habitats, the Eastern indigo snake will occupy gopher tortoise burrows. The preferred habitats include pine flatwoods, xeric oak stands, palmetto scrub, and tropical hammocks.

No Eastern indigo snakes were observed within the study area during any of the field surveys. The prevalence of potential habitat within the corridor could potentially involve the Eastern indigo snake. However, to minimize any impacts to any individual Eastern indigo snakes during construction, the following special provision will be included in the construction contract to advise the contractor of the potential presence of this species and its protected status:

- If an Eastern indigo snake is sighted during construction, the contractor will be required to cease all operation(s) which might cause harm to the snake.
- If the snake does not move away from the construction area, a state or federal biologist will be contacted to capture and relocate the snake to suitable habitat either adjacent to the project area or off-site to an acceptable donor site.
- If an Eastern indigo snake is killed or found dead within the construction area, the snake should be frozen and the USFWS Jacksonville Field Office [(904) 232-2580] via the FDOT PD&E Department will be notified immediately at (813) 975-6457.
- In addition, educational signs with pictures shall be posted throughout the project prior to initiation of construction.

Due to the condition of the surrounding area, the abundance of habitat in the project area, and the special provisions to protect transient individuals encountered during construction, the planned project is not anticipated to affect the Eastern indigo snake.

**APPENDIX B**  
**Recommended Alternative Design Concept**

**See File**  
**Final PER Plan Set.pdf**

**APPENDIX C  
Correspondence**

## MEMORANDUM

**TO:** Cobb Rd./US 98 PD&E Study File  
Financial Project ID Nos: 257299 1 22 01 & 405017 1 22 01

**FROM:** Herschel Conner

**CC:** Gabor Farkasfalvy, John Kenty, Tom Stoner, Bill Howell

**DATE:** 01/14/03

**SUBJECT:** Final Value Engineering Study

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The Value Engineering Team developed four recommendations to be carried forward in the Project Development process. After reviewing the Final report, we would respectfully recommend that none of the four VE recommendations be accepted by the Department at this time. All of the VE recommendations would be inconsistent with the need and purpose of the proposed improvements and be counter to the policy directions given by the Department during the PD&E Study.

1. **Right-of-Way.** As a relatively high-speed bypass route for heavy trucks, utilization of the urban typical should be minimized for this project. The urban typical in Segment 1A serves the more developed land uses along Cobb Rd. just north of the SR 50 intersection and will encourage slower speeds as traffic approaches the more congested area from SR 50 to the south. Extending the urban typical section to north of the CSX crossing doesn't seem appropriate in light of the more rural character of adjacent land uses. The industrial land uses near Yontz Road generate considerable heavy truck traffic which would benefit from the wider recommended typical section. Converting the closed drainage system of the Suburban typical to swales would result in the need for additional right-of-way acquisition.
2. **Rural Typical Cross Section.** The proposed rural typical meets current PPM criteria and the overall width of 240 feet is consistent with the typical recommended for the segment of US 98 from the Suncoast Parkway to US 19. The consultant and District 7 Design and Modal Planning Development staff collaborated and agreed upon the decision to use this typical section for PD&E Study purposes early in the study process. The wider rural typical section is being used for several reasons. It provides a conservative basis for estimating environmental effects. Because of the rolling terrain in Segments 3 and 4, uncertainty regarding stormwater management requirements at this stage of project development, and inclusion of a separate multi-use path, it is difficult to set precise ROW limits during PD&E conceptual design activities.

The high (34%) heavy truck volume traveling at high rates of speed (65mph) creates safety problems for bicycle utilization of the paved outside shoulder. The

multiuse path provides good separation for the pedestrians and bicyclists from the high speed traffic. To address this concern, the VE team also recommended a 10-foot paved outside shoulder, which is greater than the 8-foot (5-foot paved) required by the PPM for low volume four lane roadways.

3. **Pavement and Base.** The PD&E Scope of Services does not include a pavement design package as a deliverable. Because of the high daily truck volumes and Hernando County's history of high maintenance cost for the asphalt pavement on Cobb Rd., a decision was made (in concert with the District staff) to use concrete pavement as the basis of LRE construction cost estimates for the PD&E Study. This was done with the understanding that a more detailed evaluation of the pavement selection will be done during final design. The life cycle cost analysis in the VE Report appears to have underestimated the expected life of concrete pavement – should be 40 years, not 30 – and overestimated the life of asphalt pavement given the extremely high volume of heavy trucks.
4. **Intersection with CR 491A/Brittle Rd./Quarry Rd.** The full median opening should be at the marked county route and not be provided for an individual land use as suggested by the VE team. The VE Team's proposed new directional median at a platted but unpaved street 1100 feet to the south would create a dog leg movement for CR 491A and Brittle Rd. This new directional median would be only 900 feet from the proposed directional median at station 436+16. The resulting VE spacing of medians would not meet the Class 3 minimum spacing of 1320 feet.

The concept design for this intersection will be adjusted, however, to reduce the impact on private property that resulted from the realignment of side streets.