DRAFT

Section 1
STATE ENVIRONMENTAL IMPACT REPORT

Section 2
PROJECT DEVELOPMENT SUMMARY REPORT

For The

MINNEOLA INTERCHANGE AT FLORIDA'S TURNPIKE MILEPOST 279

Project Development and Environment (PD&E) Study

LAKE COUNTY, FLORIDA

FLORIDA'S TURNPIKE ENTERPRISE

Prepared by:

AECOM Technical Services, Inc.
150 North Orange Avenue
Suite 200
Orlando, FL 32801

October 26, 2011

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PROFESSIONAL ENGINEER CERTIFICATE

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Vanasse Hangen Brustlin, Inc., authorized to operate as an engineering business, P.E. 63437, by the State of Florida Department of Professional Regulation, Board of Engineers, and that I have prepared or approved the evaluation, findings, opinions, conclusions, or technical advice hereby reported for:

FPID No.:	**N/A**
Project:	**Hills of Minneola Turnpike Interchange (Florida's Turnpike)**
Counties:	**Lake**
FDOT Project Manager:	**Rebecca Bolan**

I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

Name: Mark Bertoncini, P.E.
P.E. No.: 63437
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SIGNATURE: _____

Date: _____

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A Project Development and Environment (PD&E) Study is being prepared for a new interchange with Florida's Turnpike, north of the State Road (SR) 50 (Clermont) interchange and south of the US 27 (Leesburg South) interchange. The proposed interchange is being studied at the request of the Family Dynamics Land Company, LLC (applicant), in consultation with the Florida's Turnpike Enterprise (FTE). In conjunction with the PD&E Study and preparation of the supporting documentation, FTE is producing an Interchange Justification Report (IJR) that will be finalized once a funding plan for the interchange has been defined.

The purpose of this interchange is to provide improved regional mobility, better access and route choice to the current regional transportation system, and improved traveler safety. This project would (1) increase mobility by providing a new interchange that improves the functionality of the existing regional transportation system, (2) increase access opportunities from the Turnpike to the communities of Clermont/Minneola, (3) reduce travel demand on sections of the state road system (US 27 and SR 50) and (4) improve traveler safety by reducing traffic volumes on congested roadway facilities.

The recommendation to construct a new interchange with Florida's Turnpike Mainline in this general area has been made in previous studies and documents. Lake County and the Lake-Sumter Metropolitan Planning Organization (MPO) conducted studies which concluded a new interchange within proximity to Milepost 279 is needed. Additionally, FTE has indicated that a new interchange, in the area of the proposed facility, has been a target for future study and implementation for nearly a decade.

All of the right-of-way required to construct this interchange is owned by the applicant and will be dedicated to the FTE. Design and construction criteria for the proposed interchange will adhere to the Florida Department of Transportation (FDOT) Design Standards for the design of the interchange and roadway elements. The design will meet the FDOT and FTE design standards and criteria in addition to regulatory requirements associated with stormwater management and drainage conveyance, while minimizing the required right-of-way.

The interchange at the Hancock Road Extension represents a single build alternative resulting from evaluations of traffic demand and operations and referenced in the Development Order (DO) associated with the approved Hills of Minneola Development of Regional Impact (DRI). The interchange includes diamond ramps in conjunction with a partial cloverleaf arrangement. This design arrangement is the Preferred Alternative based on the following analysis results:

- Proposed ramp configuration provides adequate storage for future traffic projections,
- Driver's expectations to re-enter the Turnpike from the Hancock Road extension are met. Traffic traveling northbound and southbound on the Turnpike can exit at the Hancock Road extension and return to the Turnpike to reconvene their trip,
- All electronic Toll Plaza locations were developed in conjunction with Turnpike staff,
- The design can be accommodated within the land controlled by the DRI, and
- The proposed design will have no significant impacts on the human or natural environment.

The applicant for the Minneola Interchange at Florida's Turnpike at Milepost 279 will provide or assist in obtaining the funding for design, right-of-way acquisition and construction activities. A draft agreement is in process and will specify the proportion of funding by both the applicant and FTE. It is anticipated that construction of the interchange will enable operation by or before 2015.

1.0 COMMITMENTS AND RECOMMENDATIONS

Refer to the State Environmental Impact Report (SEIR) for Commitments and Recommendations.

2.0 LOCATION AND NEEDS SUMMARY

2.1 INTRODUCTION

The Family Dynamics Land Company, LLC has requested that a potential new interchange at Milepost 279, north of State Road 50 (SR 50) and east of US 27 (see **Figure 1**) be studied in consultation with Florida's Turnpike Enterprise (FTE). As a result, a Project Development and Environment (PD&E) Study was conducted to evaluate the social, economic and environmental impacts of a new interchange with the Turnpike mainline at Milepost 279. In conjunction with the PD&E Study and preparation of the supporting documentation, FTE is producing an Interchange Justification Report (IJR) that will be finalized once a funding plan for the interchange has been defined.

The purpose of this interchange is to provide improved regional mobility, better access and route choice to the current regional transportation system, and improved traveler safety. This project would (1) increase mobility by providing a new interchange that improves the functionality of the existing regional transportation system, (2) increase access opportunities from the Turnpike to the communities of Clermont/Minneola, (3) reduce travel demand on sections of the state road system (US 27 and SR 50) and (4) improve traveler safety by reducing traffic volumes on congested roadway facilities.

Although this PD&E Study is focused on the Minneola Interchange and its approaches, the surrounding roadway network that will provide the connections to the interchange has also been studied by the City of Minneola and Lake County. The design of the interchange and the approach roadway alignment has been coordinated with the Hancock/North Grassy Lake PD&E Study. The local government has approved the design concept associated with the Hancock/North Grassy Lake PD&E study. This will provide a "seamless" connection of the north-south regional roadway (Hancock Road Extension) to the interchange, and an appropriate major intersection of North Grassy Lake Road with Hancock Road, providing a direct connection to US 27.

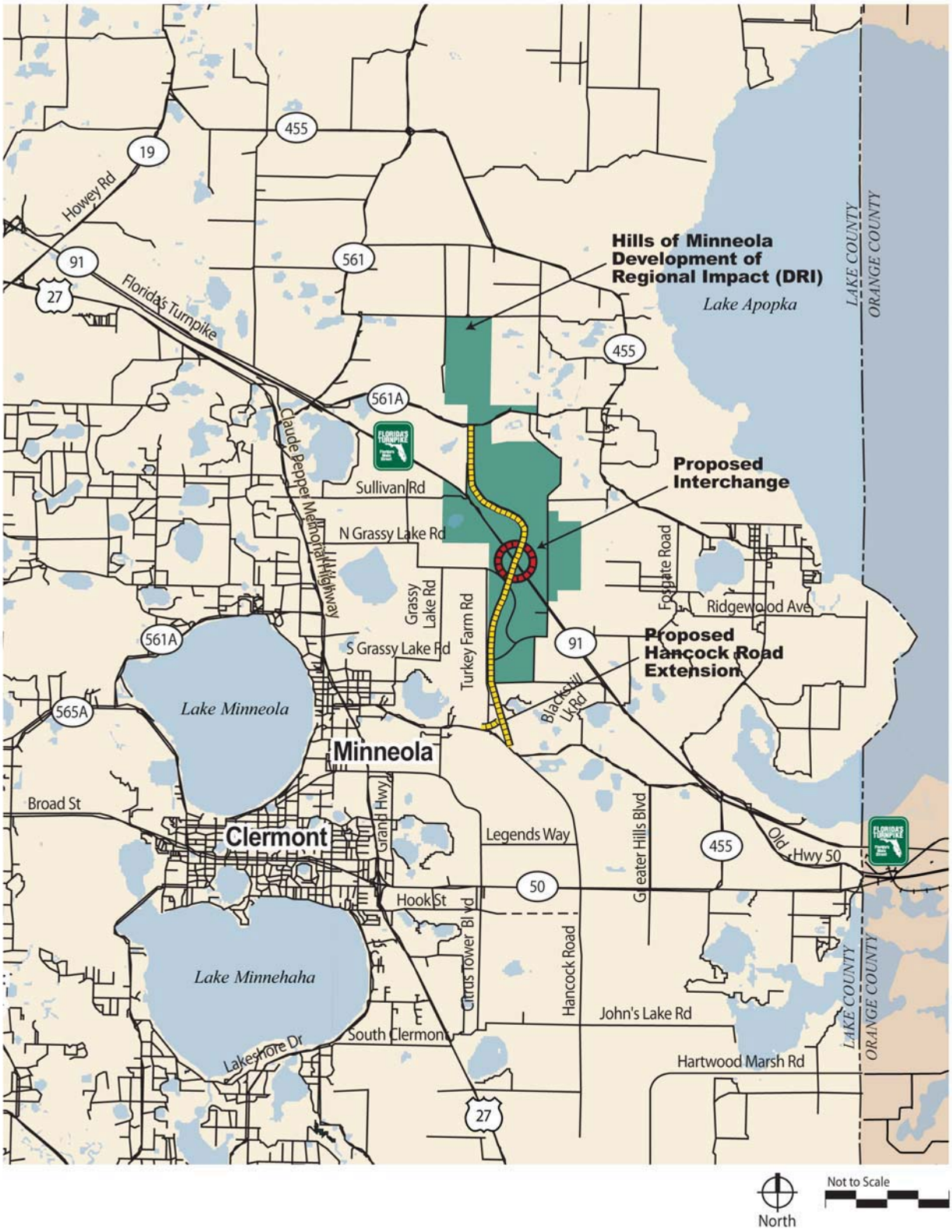


Figure 1 Project Location Map

2.2 NEED FOR IMPROVEMENT

The existing transportation network, which consists primarily of rural two-lane collectors and two major arterials, U.S. 27 (north-south) and SR 50 (east/west), is unable to adequately address future transportation needs. The future roadway network would need significant investment in capital infrastructure to satisfy the forecasted vehicle trips and efficiently accommodate the future transportation demand particularly for regional trips that travel along the south side of Lake Apopka. However, limited funds are available to expand the regional roadway network, improve existing roadways, and construct new arterials, and it is highly unlikely that any new collectors and frontage roads will occur. The Lake-Sumter Metropolitan Planning Organization's (MPO) 5 year Transportation Improvement Program (TIP) shows the following total local funding for capacity improvements from Lake County for the previous 5 years:

2005/06-2009/10	$ 5,352,000
2006/07-2010/11	$ 8,017,000
2007/08-2011/12	$ 9,038,000
2008/09-2012/13	$30,093,000
2009/10-2013/14	$38,958,000

Funding has been allocated to extend Hancock Road north toward the proposed interchange where it is referred to as the Hancock Road Extension; however, no additional roadways are currently programmed for construction in the area north of SR 50 and east of US 27. Recent reductions in tax revenue also indicate that additional projects are not likely to be constructed or considered in this area.

Several roadway segments parallel to the Turnpike are rapidly approaching their capacity thresholds. The Lake Sumter MPO's Transportation Concurrency Management System (TCMS) indicates that segments of SR 50, US 27, and CR 455 have limited remaining capacity and in some cases are currently over their published capacities. In the case of SR 50 from Hancock Road to the Orange county line the current E+C (Existing + Committed) volumes exceed 90% of the 6 lane capacity. The E+C volume for US 27 from CR 561 to CR 561A is currently at 82% of the published capacity and the 2025 Long Range Cost Feasible (LRCF) plan indicates that widening of this segment is planned for the timeframe between 2015-2025. The sections of CR 455 parallel to the Turnpike show E+C volumes that are 80-90% of their capacity and widening is not allowed for this roadway due to the Scenic Highway designation.

Although roadway improvements are planned or programmed for the SR 50 and US 27 corridor sections in the area, travel demand forecasts indicate that even with the improvements and lane additions, the adopted Level of Service (LOS) for these facilities will not be maintained for a significant length of time. In addition to the E+C data published by the Lake-Sumter MPO, the 2030 volumes projected for SR 50 are nearly double the 6 lane capacity for the roadway. Assuming this projection is valid, SR 50 will exceed the daily roadway capacity for a Class I arterial before 2014 regardless of which scenario is evaluated. US 27 will exceed its 4 lane capacity by 2030 as well. This roadway is planned for widening to 6 lanes, but not in the immediate future. The proposed Minneola Interchange at Florida's Turnpike will provide direct relief for all three parallel roadways, increasing the functional life of the existing facilities and planned improvements.

2.2.1 System Linkage

The proposed interchange has been identified as a potential project for a number of years by both local government and FTE. The significant growth in south Lake County that has occurred coupled with the approved land development projects will generate additional travel demand and continue to add pressure to the existing transportation facilities in the area, especially between Clermont and the Orlando Urban Core area. The cities of Clermont and Minneola have experienced rapid growth since the 2000s that exceeded the County average, and it is anticipated that by 2025 Lake County's population will have grown to between four and five hundred thousand, from the current level of three hundred thousand.

Roadway improvements are planned or programmed for much of the SR 50 and US 27 corridor sections in the area but travel demand forecasts indicate that even with the improvements and lane additions, the

adopted LOS standards for these facilities will not be maintained. The forecasts for the area roadway network indicate that the proposed Minneola Interchange at Florida's Turnpike will provide significant relief to sections of both US 27 and SR 50, increasing the functional life of the planned improvements for those roadways.

The area roadway network surrounding the proposed Minneola Interchange is limited in capacity and in the number of facilities that provide service to the growing commuter population that makes the daily trip to and from the Orlando metropolitan area. The primary roadways that offer significant capacity for these trips are the Turnpike and SR 50. Secondary roadways include Hartwood Marsh Road, located approximately 5 miles south of the proposed interchange, and to some extent the combination of County Roads 50 (CR 50), 455, and 438, serving a minor amount of volume between Minneola, Montverde and the Town of Oakland and Winter Garden areas. US 27 is the only major north-south facility in the Clermont/Minneola area and generally acts as a "collector-distributor" for traffic volume in the region that will eventually utilize one or more of the east-west facilities in their commute.

In the immediate area south and west of the proposed interchange, the extension of Hancock Road and North Grassy Lake Road, when constructed, will provide the necessary roadway connections from the proposed interchange to CR 50 (via Hancock Road) and to US 27 (via North Grassy Lake Road). The preferred typical section for each provides a four-lane divided major collector that will convey traffic to and from the interchange. The PD&E study is complete and final design has begun on the initial segment north of CR 50. Partial right-of-way funding has been approved by the Lake County Board of County Commissioners (BOCC) but no construction funding is yet programmed. In addition to the substantial number of approved developments that will rely on the construction of these facilities, and ultimately the interchange, a new Lake County high school will also utilize the Hancock Road Extension to operate efficiently. The local transportation agencies and the Lake-Sumter MPO are in the process of developing agreements with developers to provide the right-of-way and fund the majority of the improvements as part of their approvals for those projects. With these agreements completed, the roadways providing access to the interchange will be in place when the traffic generation occurs that will warrant the construction of the new interchange. Both Black West and the Hills of Minneola have issued letters to Lake County indicating their cooperation for right-of-way and construction funding on major segments of the Hancock Road Extension south of the Turnpike.

In addition to these developments, there are many additional mixed-use developments located within a five-mile radius of the proposed interchange. They have been approved for development and are in various stages of completion (**Figure 2**). Escalating travel demands are being placed on the existing transportation network due to the steady increase in housing developments, office and retail uses, and other public realm amenities.

Immediately north of the Turnpike and the proposed interchange, the property is solely owned by a single developer that has committed to funding this PD&E study, the design, and a significant portion of the interchange construction and the continued extension of the collector roadway though the property to an intersection with County Road 561A. This will provide the linkage to the existing roadway network in that area, and those additional approved developments north of the Turnpike.

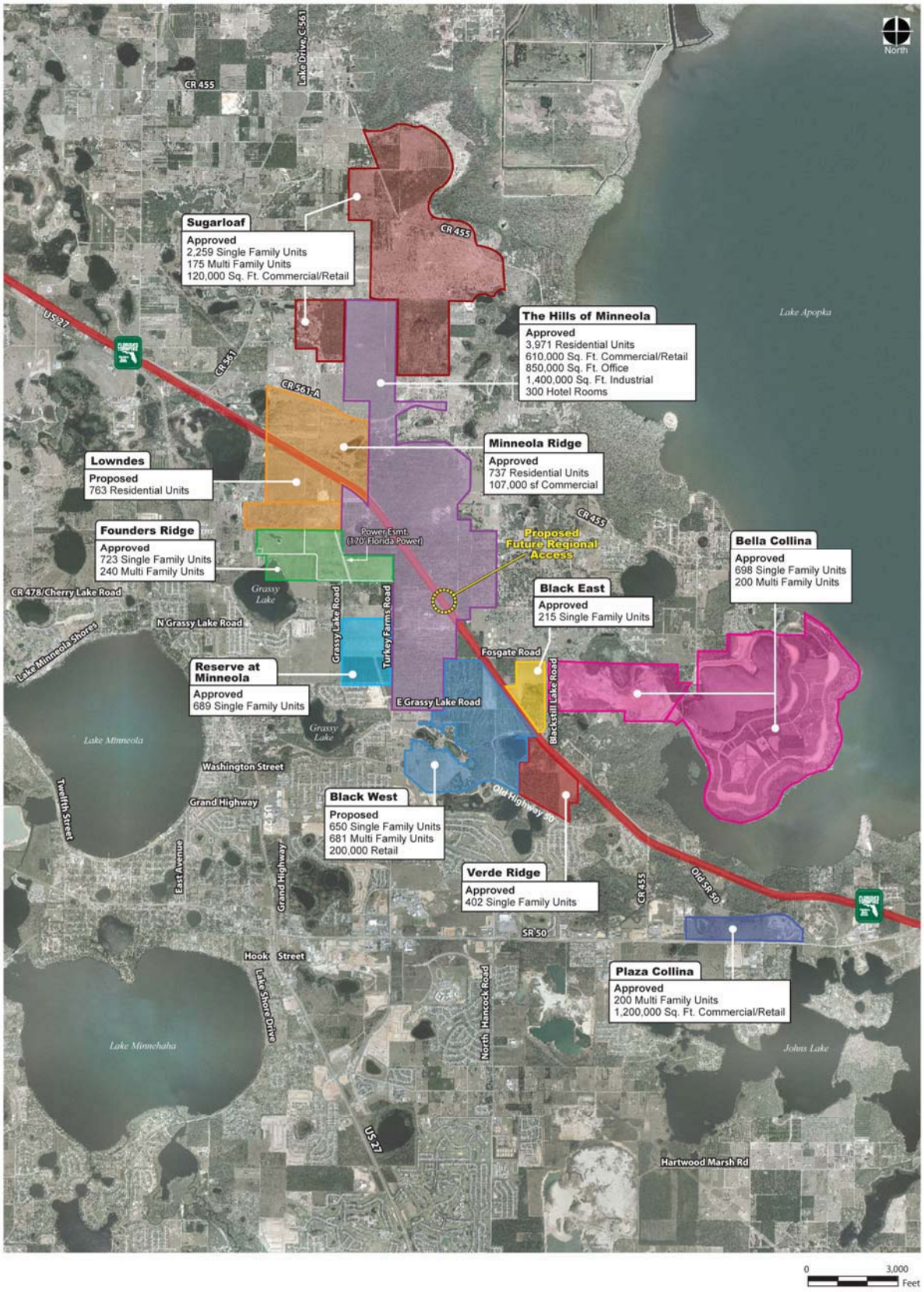


Figure 2 Planned and Approved Developments in the Region

2.2.2 Transportation Demand

The traffic forecasts were developed using approved methodologies applied by FTE for proposed new interchanges that will connect the surrounding communities to the Turnpike via added roadway infrastructure. The travel demand forecasts were developed for two (2) different years. They are: Year 2015 (potential opening year) and 2035 (20 years post opening – Design Year). The travel demand estimated for 2035 is utilized in the design of the proposed Minneola Interchange at Florida's Turnpike.

The Annual Average Daily Traffic (AADT) estimated for the proposed interchange and the connecting collector roadway (Hancock Road Extension) represent volumes that warrant the construction of a major full movement interchange at the proposed location. AADT on the roadway approaches and the ramps to and from the interchange for Year 2035 are shown below.

Table 1 - AADT Volumes – Year 2035

Hancock Road Extension – South of Interchange	33,900
Hancock Road Extension – North of Interchange	37,700
Southbound Off Ramp	1,900
Southbound On Ramp	18,600
Northbound Off Ramp	18,600
Northbound On Ramp	1,900

Source: Florida's Turnpike Enterprise

Interchange ramp, overpass sections and approaches are each designed to meet the demands for anticipated peak-hour traffic volumes (see **Table 2**). The widening of the Turnpike Mainline is currently unfunded. Without widening and without the interchange, the Turnpike will operate at an unacceptable LOS standard in the peak direction during design hours in 2015. If the Turnpike is widened to six lanes north of the Clermont (SR 50) interchange, acceptable levels of service would be maintained during the design hours through 2035. With the proposed Minneola interchange, the Mainline south of the interchange would fall below an acceptable LOS during the design hour by 2025. The interchange, therefore, hastens the need to widen this segment of the Mainline to eight lanes in the design year.

Table 2 - PM Peak-Hour Traffic Volumes – Year 2035

Location	Year 2035
NB Off Ramp	2,290
SB On Ramp	1,840
SB Off Ramp	190
NB On Ramp	240
Turnpike Mainline South of Interchange	7,810
Turnpike Mainline North of Interchange	5,760
Hancock Road Extension South of Interchange	2,230
Hancock Road Extension North of Interchange	2,420

Source: Florida's Turnpike Enterprise

2.2.3 Consistency with Transportation Plans

The interchange is recognized as a compelling need by the Lake-Sumter MPO and is included on the Long Range Transportation Plan (LRTP).

2.2.4 Social Demands or Economic Developments

Florida's Turnpike is a major north/south corridor for commercial and private transportation. Construction of the new interchange will allow the highway to continue to address the transportation needs of the region in response to the demands of population growth in the area. Between 2000 and 2010, the population of Lake County increased from 212,842 to 295,000 and is projected to increase to 440,700 by

the year 2030 based on Medium projections from the Bureau of Economic and Business Research at the University of Florida.

Figure 2 depicted the Planned and Approved Developments in the immediate area around the new interchange. The conversion of historically agricultural lands to residential and mixed use development will increase demand for adequate transportation facilities and services within the region.

The decline in the economy that began in the middle of the decade (2006/07) and the resulting recession has had far-reaching impacts, including travel and trip productions on the highways. Nationally, travel has been reported as having declined by 7% or more. In Florida, a similar decline has been reflected, with some major facilities showing declines of 10% or more. Data from FTE indicates that users of the Turnpike in the area of Lake County are down by 7.9% when compared to volumes in 2007.

Although it is not possible to estimate when and to what level travel demand will increase over the next few years, it is clear that ridership on the Turnpike will remain depressed for some period and as has been confirmed by most Central Florida economists, the recovery to the economy and automobile travel will be slow and over a long period of time.

3.0 SUMMARY OF EXISTING CONDITIONS

3.1 ROADWAY

3.1.1 Functional Classification

The Turnpike is functionally classified by the Lake-Sumter MPO as urban/transitioning and Rural Areas map designates the entire length of the Turnpike as transitioning with a corresponding LOS standard of "C". Lake County identifies it as a Rural Principal Arterial and it currently has LOS standard of "B". Hancock Road has been identified as an urban arterial by Lake County and has a LOS standard of "D".

3.1.2 Typical Section

The existing typical section for the Turnpike in the project area consists of four 12-foot travel lanes (two in each direction), with a 40-foot depressed median. The outside shoulders are 10-foot paved on both sides of the roadway. There is an existing 4-foot inside shoulder in the northbound direction and an 8 foot paved shoulder in the southbound direction with double face guardrail at the edge of pavement. The roadway facility has a 70 MPH design speed and has a posted speed of 70 MPH. An illustration showing the existing typical section is shown below in **Figure 3.**

The PD&E Study performed for the City of Minneola and Lake County identified a typical cross section for Hancock Road Extension that is described subsequently in Section 5.3**.**

3.1.3 Right-Of-Way

Throughout the majority of the project corridor limits, the existing right-of-way width of the Turnpike is 300 feet, 150 feet wide on the left and right sides of the centerline. Beginning at Station 15297+06.00, the right-of-way is widened to the left of the existing centerline to a maximum width of 200 feet, extending the total right-of-way width to 350 feet. All additional right-of-way to be required by this interchange is available and will be donated by the adjacent property owner.

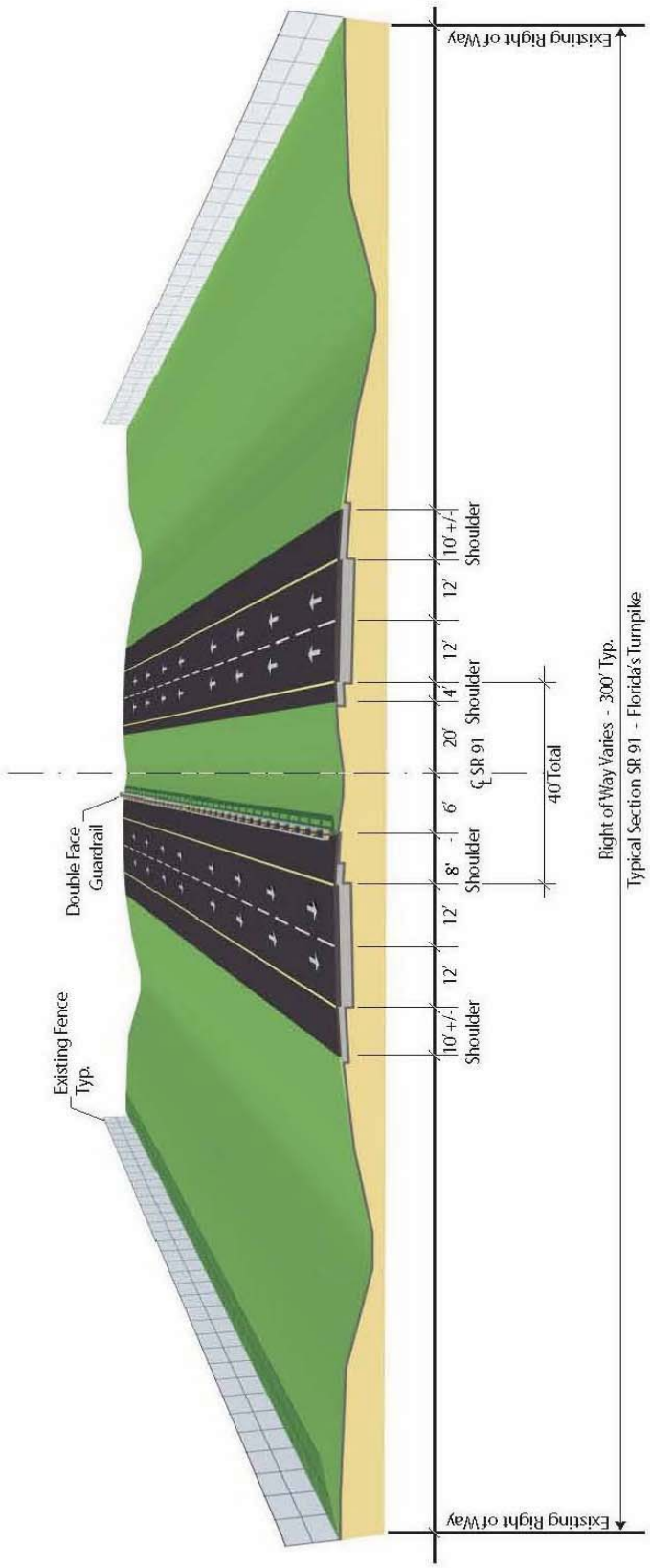


Figure 3 Typical Section – Existing Conditions Florida's Turnpike

3.1.4 Horizontal and Vertical Alignment

In the vicinity of the proposed interchange, the Turnpike has a constant grade of 0.7%. The Turnpike generally has a north-south alignment, but in the area of the proposed interchange, the alignment is situated in a northwest-southeast direction. **Table 3** shows the existing horizontal curve data.

TABLE 3 – EXISTING HORIZONTAL CURVE DATA

Location	Curve No.	PI Sta. (ft)	Radius (ft)	Length (ft)	Superelevation
North of Proposed Interchange	CLTURNPIKE	15310+57.23	5,521.73	2,224.65	Normal Crown

3.1.5 Existing Traffic

Table 4 summarizes the existing/programmed geometry, LOS, v/C ratio and a summary of projected conditions with the committed traffic on the roadway segments in the vicinity of this interchange. All of the roadway segments in the vicinity of the interchange are currently operating within their adopted LOS. However, one segment of SR 50 will exceed its capacity with the addition of committed trips. Four additional segments will be within 20% of exceeding their capacity with the addition of committed trips. One of the segments is on US 27, which is an SIS/FIHS facility. The Turnpike itself has a 2009 volume of 41,835 vehicles per day and a directional design hour volume (DDHV) volume of 2,391 vehicles per hour which indicate LOS "C" conditions.

3.1.6 Crash History

US 27/SR 50
Crash records were requested for years 2005-2009, inclusive, for the limits of US 27 from SR 50 to CR 561 (Milepost 15.00 to Milepost 23.20), two segments of SR 50, from US 27 to Orange-Lake County Line in Lake County (Milepost 13.575 to Milepost 18.679), and from the Orange-Lake County Line to Avalon Road (Milepost 0.00 to Milepost 3.08) in Orange County. **Tables 5** and **6** summarize the available crash data for these three segments.

Table 4 – Lake County TCMS Segment Report – June 1, 2009

			ROADWAY INFORMATION						EXISTING				EXISTING+COMMITTED		
STREET	FROM	TO	SIS	NUM LANE	FUNCTIONAL CLASS	LOS STD SOURCE*	LOS STD	LOS CAP	Exist. AADT	EB NB	WB SB	VC RATIO	E+C EB NB	E+C WB SB	E+C VC RATIO
BLACKSTILL LAKE ROAD	FOSGATE ROAD	CR 50	N	2	MINOR COLLECTOR	Table 4-8	D	760	2659	156	101	0.21	196	169	0.26
C.R. 455	CR 561	CR 561A	N	2	MAJOR COLLECTOR	Table 4-9	C	590	1675	73	78	0.13	168	211	0.36
C.R. 455	CR 561 A	RIDGEWOOD AVENUE	N	2	MAJOR COLLECTOR	Table 4-9	D	740	2603	88	146	0.20	164	195	0.26
C.R. 455	RIDGEWOOD AVENUE	CR 455/ CR 50	N	2	MAJOR COLLECTOR	Table 4-8	D	720	5095	317	171	0.44	669	394	**0.93**
C.R. 455	CR 455 / CR 50	SR 50	N	2	COLLECTOR	Table 4-7	D	760	6206	398	225	0.52	619	495	**0.81**
C.R. 50	US 27	HANCOCK ROAD	N	2	COLLECTOR	Table 4-7	D	760	9059	508	375	0.67	703	547	**0.93**
C.R. 50	HANCOCK ROAD	CR 455	N	2	COLLECTOR	HIGH-Plan	D	1310	5107	139	574	0.44	443	1015	0.77
C.R. 50	CR 455	ORANGE COUNTY LINE	N	2	COLLECTOR	Table 4-7	D	760	4892	102	570	0.75	192	667	**0.88**
C.R. 561	CR 455	HOWEY CROSS ROAD	N	2	MAJOR COLLECTOR	Table 4-9	C	590	4878	209	261	0.44	251	286	0.48
C.R. 561	HOWEY CROSS ROAD	TURNPIKE ROAD / CR 561A	N	2	MAJOR COLLECTOR	Table 4-8	D	720	5644	249	296	0.41	317	336	0.47
C.R. 561	US 27	EAST AVENUE	N	2	COLLECTOR	Table 4-7	D	760	1587	59	73	0.10	59	73	0.10
C.R. 561	EAST AVENUE	W MINNEOLA AVENUE	N	2	COLLECTOR	Table 4-7	D	760	1587	59	73	0.10	59	73	0.10
C.R. 561 / C.R. 561A	TURNPIKE ROAD / CR 561A	US 27	N	2	COLLECTOR	Table 4-8	D	720	6750	369	327	0.51	438	368	0.61
C.R. 561A	TURNPIKE ROAD / CR 561	CR 455	N	2	MINOR COLLECTOR	Table 4-8	D	720	1176	73	54	0.10	233	151	0.32
C.R. 561A	CR 561	C.R. 565A	N	2	COLLECTOR	Table 4-7	D	760	3040	150	126	0.20	150	126	0.20
C.R. 561A	CR 565A	JALARMY ROAD	N	2	COLLECTOR	Table 4-7	D	760	4271	113	112	0.15	113	112	0.15
C.R. 561A	JALAMRY ROAD	US 27	N	2	COLLECTOR	Table 4-7	D	760	2172	246	314	0.41	246	314	0.41
CITRUS TOWER BOULEVARD	US 27	OAKLEY SEAVER DRIVE	N	2	COLLECTOR	Table 4-7	D	760	10679	450	514	0.68	450	514	0.68
CITRUS TOWER BOULEVARD	OAKLEY SEAVER DRIVE	SR 50	N	4	COLLECTOR	Table 4-7	D	1620	13604	595	559	0.37	649	610	0.40
CITRUS TOWER BOULEVARD	SR 50	JOHNS LAKE ROAD	N	4-D	COLLECTOR	Table 4-7	C	1120	10309	428	449	0.40	495	518	0.46
EAST AVENUE	CR 561	SR 50	N	2	COLLECTOR	Table 4-7	D	530	5517	248	272	0.51	248	272	0.51
GRAND HIGHWAY	CITRUS TOWER BOULEVARD	SR 50	N	2	COLLECTOR	Table 4-7	C	480	4628	220	208	0.46	222	211	0.46
N. HANCOCK ROAD	CR 50	N RIDGE BOULEVARD	N	4	COLLECTOR	Table 4-7	D	1620	8258	392	400	0.25	906	794	0.56
N. HANCOCK ROAD	N RIDGE BOULEVARD	SR 50	N	4	COLLECTOR	Table 4-7	D	1620	13722	628	509	0.39	1228	962	0.76
S. HANCOCK ROAD	SR 50	HOOKS STREET	N	4	COLLECTOR	Table 4-7	D	1620	12311	439	614	0.38	593	767	0.47
S. HANCOCK ROAD	HOOKS STREET	JOHNS LAKE ROAD	N	2	COLLECTOR	Table 4-7	D	760	6267	322	199	0.42	476	352	0.63
S. HANCOCK ROAD	JOHNS LAKE ROAD	HARTWOOD MARSH ROAD	N	2	COLLECTOR	Table 4-7	D	760	6267	322	199	0.42	447	336	0.59
HOOK STREET	LAKESHORE DRIVE	US 27	N	2	COLLECTOR	Table 4-7	C	480	5213	184	256	0.53	184	256	0.53
HOOK STREET	US 27	HANCOCK ROAD	N	4	COLLECTOR	Table 4-7	C	1120	5468	163	239	0.21	179	254	0.23
JALARMY ROAD	CR 478	CR 561A	N	2	COLLECTOR	Table 4-7	D	530	2073	119	83	0.22	119	83	0.22
LAKESHORE DRIVE (CLER)	HARDER ROAD	ANDERSON HILL ROAD	N	2	MINOR COLLECTOR	Table 4-7	D	760	12176	349	686	0.90	362	710	**0.93**
N. GRASSY LAKE ROAD	US 27	TURKEY FARM ROAD	N	2	LOCAL	Table 4-7	D	530	535	15	21	0.04	290	324	0.61
SR 50	SR 33 SOUTH	CR 565A NORTH	N	4	PRINCIPAL ARTERIAL - OTHER	ART-Plan	D	2170	23901	782	1077	0.50	905	1272	0.59
SR 50	CR 565A NORTH	CR 561	N	4	PRINCIPAL ARTERIAL - OTHER	ART-Plan	D	2170	23867	676	1133	0.52	794	1320	0.61
SR 50	CR 561	EAST AVENUE	N	4	PRINCIPAL ARTERIAL - OTHER	ART-Plan	D	1900	27294	804	1233	0.65	925	1357	0.71
SR 50	EAST AVENUE	US 27	N	4	PRINCIPAL ARTERIAL - OTHER	ART-Plan	D	1900	34187	1256	1264	0.67	1398	1407	0.74
SR 50	US 27	HANCOCK ROAD	N	4	PRINCIPAL ARTERIAL - OTHER	ART-Plan	D	1910	41644	1359	1734	0.91	1865	2287	**1.20**
SR 50	HANCOCK ROAD	CR 455	N	6	PRINCIPAL ARTERIAL - OTHER	ART-Plan	D	3370	53499	1539	2392	0.71	2255	3181	**0.94**
SR 50	CR 455	ORANGE COUNTY LINE	N	6	PRINCIPAL ARTERIAL - OTHER	ART-Plan	D	3370	47363	1374	2341	0.69	2315	3189	**0.95**
US 27/SR 25	FLORIDA TURNPIKE	SR 19	Y	4	PRINCIPAL ARTERIAL - OTHER	Table 4-8	C	2230	24360	878	997	0.45	905	1035	0.46
US 27/SR 25	SR 19	CR 561	Y	4	PRINCIPAL ARTERIAL - OTHER	Table 4-8	C	1730	18786	613	762	0.44	686	842	0.49
US 27/SR 25	CR 561	CR 561A	Y	4	PRINCIPAL ARTERIAL - OTHER	Table 4-7	C	1810	28418	1105	1174	0.65	1347	1480	**0.82**
US 27/SR 25	CR 561A	CR 561/ MAIN AVENUE	Y	6	PRINCIPAL ARTERIAL - OTHER	Table 4-7	C	2720	30554	1310	1199	0.48	1448	1379	0.53
US 27/SR 25	CR 561/ MAIN AVENUE	CR 50	Y	6	PRINCIPAL ARTERIAL - OTHER	Table 4-7	C	2720	30554	1310	1199	0.48	1421	1356	0.52
US 27/SR 25	CR 50	GRAND HIGHWAY	Y	6	PRINCIPAL ARTERIAL - OTHER	Table 4-7	C	2720	28245	1130	1146	0.42	1294	1315	0.48
US 27/SR 25	GRAND HIGHWAY	SR 50	Y	6	PRINCIPAL ARTERIAL - OTHER	Table 4-7	C	2720	22870	849	872	0.32	1029	1081	0.40
US 27/SR 25	SR 50	JOHNS LAKE ROAD	Y	6	PRINCIPAL ARTERIAL - OTHER	Table 4-7	C	2720	30759	1191	1182	0.44	1440	1440	0.53

*Source refers to the FDOT Generalized LOS Tables unless indicated otherwise.

SIS—Strategic Interstate

System (Yes or No); STD—LOS standard; CAP—Service volume at the LOS standard. AADT—current annual average daily traffic, Existing—the existing PM peak hour volume; E+C—the Existing + Committed PM peak hour volume for the segment; EB NB –the NB or EB PM Peak Hour volume; WB SB –the westbound or southbound PM peak hour volume; VC Ratio—the ratio of volume to capacity (percent of capacity at the adopted LOS used).

Table 5 - Summary of Crash History, Years 2005 – 2009

Roadway	Segment	Length (mi)	Crashes							Fatalities						
			2005	2006	2007	2008	2009	Avg	Total	2005	2006	2007	2008	2009	Avg.	Total
SR 50	US 27 to Orange-Lake County Line	5.104	90	86	93	134	98*	100.2	501	1	0	1	2	0*	0.8	4
SR 50	Orange-Lake County Line to Avalon Road	3.080	58	57	58	56	43	54.4	272	3	0	1	0	0	1	5
US 27	SR 50 to CR 561	8.200	63	72	59	42	32	53.6	268	1	1	0	0	1	0.6	3

Table 6 – Roadway Volumes and Crash Rates, Years 2005-2009

Roadway	Segment	Length (mi)	AADT (in thousands)						Crash Rate per 1 million vehicle miles					
			2005	2006	2007	2008	2009	Avg.	2005	2006	2007	2008	2009	Avg.
SR 50	US 27 to Orange-Lake County Line	5.104	56.0	53.0	56.0	49.0	47.0*	52.2	.863	.871	.891	1.468	1.119*	1.042
SR 50	Orange-Lake County Line to Avalon Road	3.080	53.0	54.0	52.5	47.5	47.0	50.8	.973	.939	.983	1.011	.814	.944
US 27	SR 50 to CR 561	8.200	30.5	31.5	33.5	28.0	28.5	30.4	.690	.764	.588	.501	.375	.584

Source: FDOT State Safety Office Crash Database
***Segment under construction for widening, FDOT Item No. 238429-4**

Although the number of crashes fluctuates from year to year, the actual crash rates for the two segments on SR 50 have remained fairly consistent, except for 2008, with a high of 1.468 crashes per million vehicle miles on the segment in Lake County. In 2008, there were 134 crashes for that segment, compared to less than 100 for the other four years. An evaluation of the crashes occurred for 2008 do not indicate that there were any anomalous incidents related to the time of year. The crash rate for US 27 peaks in 2006 and has decreased in the last three years. For the segment of US 27 and the segment of SR 50 in Orange County, the crash rate for the most recent year (2009) is less than the average over the past five years. In comparison to the 2008 statewide average crash rates for similar facilities, the crash rate per million vehicles miles on the two segments of SR 50 and segment of US 27 are lower. It should be noted that the Lake County segment of SR 50 is under construction for widening in 2009 and may skew the crash rates for that year. The 2009 statewide average crash rate for a 4-5 lane suburban arterial is 1.382 crashes per million vehicle miles of travel. For a six-lane suburban arterial, the crash rate is 2.121 crashes per million vehicle miles of travel. During the five years' worth of crash data from 2005-2009, the crash rates on the three segments did not exceed the 2009 statewide averages.

It is expected that the construction of the interchange will help relieve traffic from both SR 50 and US 27 and ultimately reduce the number of crashes further.

SR 91 (Florida's Turnpike)
A 5-year summary of crashes were provided for Florida's Turnpike Mainline (See **Table 7**), between Milepost 272.0 to 286.0 (The proposed Hills of Minneola interchange is located at Milepost 279). Statistics for the crashes include years 2005 through 2009, inclusive. During this 5-year period, a total of 549 crashes were reported. Of those, 10 (1.82%) resulted in fatalities. The number of crashes by year remained consistent over this 5-year period from a low of 104 (2005) to 118 (2009). **Table 8** summarizes the crash rates for the 14-mile segment of Florida's Turnpike.

TABLE 7 – SUMMARY OF TURNPIKE CRASH HISTORY, YEARS 2005 - 2009							
SUMMARY	2005	2006	2007	2008	2009	TOTAL	%
TOTAL	104	106	109	112	118	549	100.00
PROPERTY DAMAGE ONLY	27	32	48	49	58	214	38.98
FATALITY CRASHES	4	1	0	3	2	10	1.82
INJURY CRASHES	73	73	61	60	58	325	59.20
CRASH TYPE							
(0) Unknown / Not Coded	0	0	3	10	7	20	3.64
(1) Collision Rear End	29	25	20	26	42	142	25.87
(2) Collision Head On	0	1	0	0	0	1	0.18
(3) Collision Angle	11	6	13	7	11	48	8.74
(4) Collision Left Turn	0	0	1	0	0	1	0.18
(5) Collision Right Turn	0	0	0	0	0	0	0
(6) Collision Sideswipe	7	8	8	9	12	44	8.01
(7) Collision Backed Into	0	0	2	3	0	5	0.91
(8) Collision w/ Parked Car	0	1	0	0	0	49	8.93
(9) Collision w/ MV On Roadway	0	0	1	0	2	3	0.55
(10) Collision w/ Pedestrian	0	1	0	0	0	1	0.18
(11) Collision w/ Bicycle	0	0	0	0	0	0	0
(12) Collision w/ Bike (Bike Lane)	0	0	0	0	0	0	0
(13) Collision w/ Moped	0	0	0	0	0	0	0
(14) Collision w/ Train	0	0	0	0	0	0	0
(15) Collision w/ Animal	0	0	0	0	0	0	0
(16) MV H/Sign/Sign Post	1	2	1	1	1	6	1.09
(17) MV H/Utility Pole/Light Pole	0	0	0	1	1	2	0.36
(18) MV H/Guardrail	17	25	24	33	13	112	20.40
(19) MV H/Fence	1	0	0	1	0	2	0.36
(20) MV H/Concrete Barrier Wall	0	2	0	1	2	5	0.91
(21) MV H/ Bridge/Pier/Abutment/Rail	0	0	0	0	0	0	0
(22) MV H/Tree/Shrubbery	0	3	0	1	0	4	0.73
(23) Collision w/ Construction Barricade/Sign	0	0	0	1	0	1	0.18
(24) Collision w/ Traffic Gate	0	0	0	1	0	1	0.18
(25) Collision w/ Crash Attenuators	1	0	0	0	2	3	0.55
(26) Collision w/ Fixed Object Above Road	0	2	0	0	0	2	0.36
(27) Hit Other Fixed Object	0	0	0	0	1	1	0.18
(28) Collision w/ Moveable Object on Road	4	1	2	4	1	12	2.19
(29) Ran In Ditch Culvert	4	2	1	3	1	11	2.00
(30) Ran Off Road into Water	4	0	2	0	1	7	1.28
(31) Overturned	10	15	12	3	8	48	8.74
(32) Occupant Fell from Vehicle	0	0	0	0	0	0	0
(33) Tractor/Trailer Jackknifed	1	1	0	0	0	2	0.36
(34) Fire	0	0	0	0	0	0	0
(35) Explosion	0	0	0	0	0	0	0
(36) Downhill Runaway	0	0	0	0	0	0	0
(37) Cargo Loss or Shift	0	0	3	0	3	6	1.09
(38) Separation of Units	0	0	0	0	0	0	0
(39) Median Crossover	0	0	0	0	1	1	0.18
(77) All Other	14	11	16	7	9	57	10.38
Causal Factors							
(0) Unknown	0	0	0	4	2	6	1.09
(1) No Improper Driving/Act	15	18	19	11	8	71	12.93
(2) Careless Driving	62	58	47	59	56	282	51.37
(3) Failed To Yield Right Of Way	0	1	3	2	2	8	1.46

TABLE 7 – SUMMARY OF TURNPIKE CRASH HISTORY, YEARS 2005 – 2009 (CONT.)							
(4) Improper Backing	0	0	1	3	1	5	0.91
(5) Improper Lane Change	8	7	23	15	19	72	13.11
(6) Improper Turn	3	2	1	2	0	8	1.46
(7) Alcohol-Under Influence	0	0	0	0	1	1	0.18
(8) Drugs-Under Influence	0	0	0	0	0	0	0
(9) Alcohol & Drugs-Under Influence	0	0	0	0	0	0	0
(10) Followed Too Closely	2	1	3	1	1	8	1.46
(11) Disregarded Traffic Signal	0	0	0	0	0	0	0
(12) Exceeded Safe Speed Limit	3	3	2	0	3	11	2.00
(13) Disregarded Stop Sign	0	0	0	0	0	0	0
(14) Failed To Maintain Equipment/Vehicle	0	1	1	1	3	6	1.09
(15) Improper Passing	0	0	0	1	1	2	0.36
(16) Drove Left of Center	0	1	0	1	0	2	0.36
(17) Exceeded Stated Speed Limit	0	2	0	1	1	4	0.73
(18) Obstructing Traffic	0	0	0	0	0	0	0
(19) Improper Load	1	0	3	0	2	6	1.09
(20) Disregarded Other Traffic Control	0	0	1	0	1	2	0.36
(21) Driving Wrong Side/Way	0	0	0	0	0	0	0
(22) Fleeing Police	0	0	0	0	0	0	0
(23) Vehicle Modified	0	0	0	0	0	0	0
(24) Driver Distraction	0	1	0	0	1	2	0.36
(77) All Other	10	11	5	11	16	53	9.65
(88) Unknown	0	0	0	0	0	0	0

Source: Florida's Turnpike Enterprise

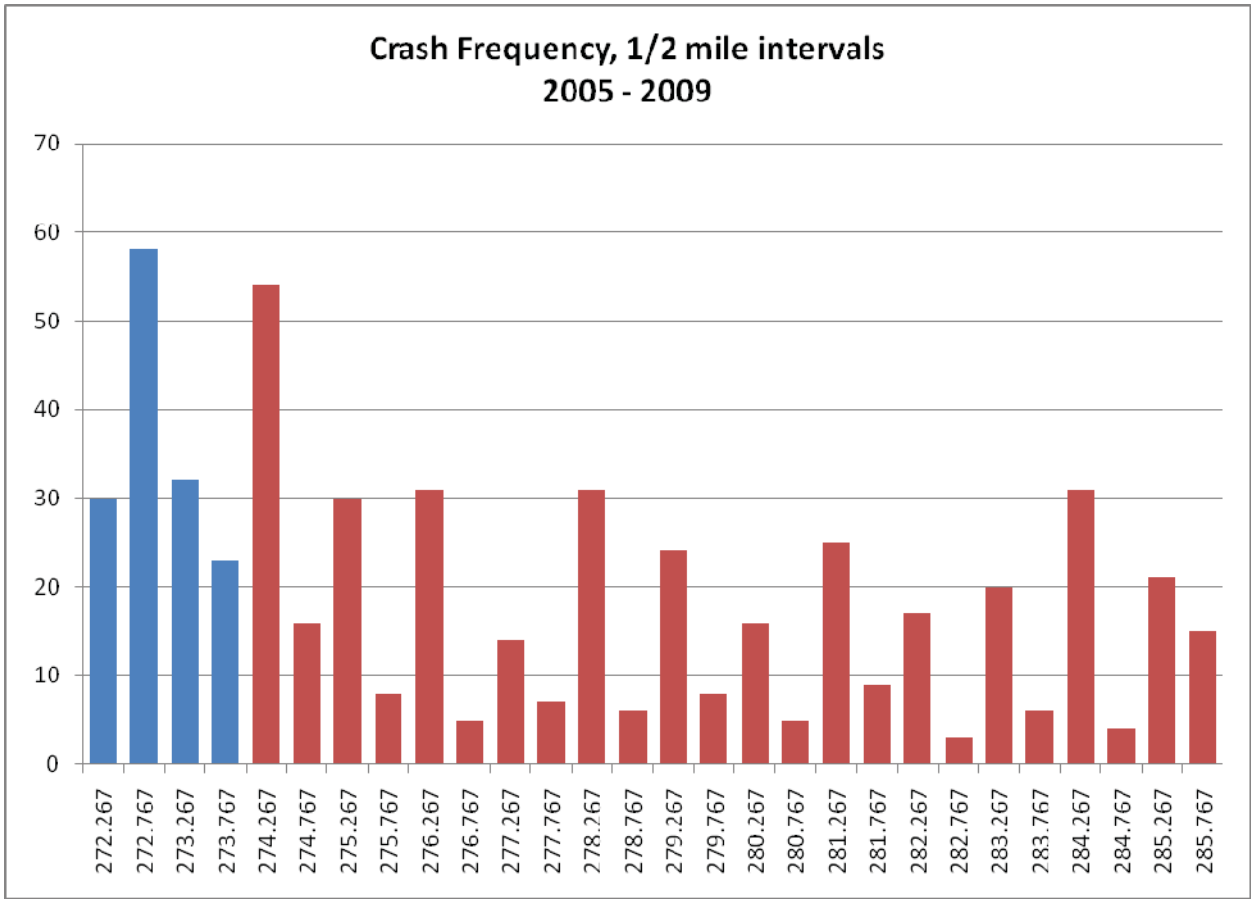
Table 8 – Turnpike Volumes and Crash Rates, Years 2005 – 2009

Roadway	Segment	Length (mi)	AADT (in thousands)						Crash Rate per 1 million vehicle miles					
			2005	2006	2007	2008	2009	Avg.	2005	2006	2007	2008	2009	Avg.
Florida's Turnpike	MP 272 – MP 286	14	39.6	43.6	44.4	41.3	40.9	42.0	.514	.476	.480	.531	.564	0.393

Rear end and collisions with fixed objects account for nearly half of all of the crash types. Of the causal factors, over half of the crashes were attributed to careless driving.

The actual crash rate from 2005 to 2009 for Florida's Turnpike between Milepost 272 and Milepost 286 ranged from 0.476 to 0.564 crashes per million vehicle miles, representing a consistent rate for these five years with no apparent statistical outliers. The statewide average crash rate for rural classified toll roads is 0.393 crashes per million vehicle miles for a similar period. The resulting Safety Ratio is greater than 1.0 the five years analyzed indicating a possible safety concern. However, portions of the limits that were evaluated include urban sections. The statewide average for urban classified toll roads is 0.616 crashes per million vehicle miles, which is higher than each of the five year averages. Additionally, the variance and standard deviation of the crash rates may be the result of factors such as construction during one or more of those years. The southern end of the study limits experienced a greater number of crashes, which is part of the more urbanized area (**Table 9**). The figure breaks down the number of crashes by half-mile sections, blue representing the portion of the study segment in Orange County and red representing the portion of the study segment in Lake County.

Table 9 - Five-year Crash Frequency for ½ mile intervals, Years 2005 – 2009



3.2 BRIDGES

There are no existing bridges within the project limits.

4.0 ALTERNATIVES ANALYSIS

4.1 DESIGN CRITERIA

This section provides a review of the design controls and standards used to develop the alternative and the recommended interchange design concept.

4.1.1 Roadway Design Criteria

Table 10 summarizes the major design criteria for the project roadways. All criteria are subject to change and only current criteria will be used during the final design phase.

Design and construction criteria for the proposed interchange will adhere to the Florida Department of Transportation (FDOT) Design Standards for the design of the interchange and roadway elements. Additionally, the design elements will comply with the applicable standard practices as set forth in the following documents:

- FDOT Project Development & Environment Manual
- FDOT Plans Preparation Manual, Volumes I and II, English, January 2011
- FDOT Structures Manual (Load Resistance Factor Design, January 2011)
- FDOT Manual on Uniform Traffic Studies 2000 (revised 2003)

- FDOT Utility Accommodations Manual (2010)
- FDOT Design Standards (2010)
- FDOT Standard Specifications for Road and Bridge Construction (2010)
- FDOT Drainage Manual (2010)
- Turnpike Drainage Manual Supplement (2008)
- American Association of State Highway and Transportation Officials (AASHTO) A Policy on Geometric Design of Highways and Streets (2004)
- FTE FDOT Plans Preparation and Practices Handbook (TPPPH) (2011)
- AASHTO Roadside Design Guide (2002)
- Federal Highway Administration-Manual on Uniform Traffic Control Devices (2009)
- Transportation Research Board Highway Capacity Manual
- Florida's Quality/Level of Service Handbook 2009
- Maintenance of Traffic DOT Topic No. 625-010-010
- Applicable Federal, State, and local laws governing safety and health policies, including Title 29, Code of Federal Regulations, Parts 1910 and 1976, Occupational Safety and Health Regulations
- FDOT – Soils and Foundations Handbook

TABLE 10 Roadway Design Criteria

SUBJECT		CRITERIA	REFERENCE	SECTION
Design Speed/Posted Speed				
	mainline Turnpike:	70 mph/70 mph		
	ramp	55mph/55mph to 35mph/35mph		
Lane Widths				
	mainline	through or travel lane: 12 ft	PPM	Table 2.1.1
	ramp (R >= 500 ft)	1-lane ramp:15 ft 2-lane ramp:24 ft	PPM	Table 2.1.3
	ramp (R >= 500 ft)	based on design speed and radius	PPM	Table 2.14.1
Auxiliary Lane	min acceleration length	based on design speed	AASHTO	Exhibit 10-70
	min deceleration length	based on design speed	AASHTO	Exhibit 10-73
Tapers				
	taper (auxiliary lane to 2- lane ramp)	2500 ft	AASHTO	Exhibit 10-52
	mainline/ramps	300 ft	STD	Index 525
	crossroad ramp terminals	180 ft exit / 250 ft entrance	STD	Index 525
	crossroad	50 ft	STD	Index 526
	lane drop taper	300 ft	AASHTO	Exhibit 10-70
	mainline/ramps	1:50 to 1:70	AASHTO STD	Exhibit 10-70,76 Index 525
	angle (exit ramp)	+ 4^{o}	STD	Index 525
Cross Slopes				
	max. algebraic difference in cross slope between through lanes	4%	PPM	Sec. 2.1.5
	max lanes sloped in one direction	3	PPM	Sec. 2.1.5
	bridges (travel lanes and shoulder slopes)	2%	PPM	Sec. 2.1.5
	new bridges	3% (if possible)	TPPPH	Sec. 2.1.5
Shoulders				
	freeways without shoulder gutter			
	4-lane or more outside of median	full width: 12 ft paved width: 10 ft slope: 6% when DDHV for truck traffic exceeds 250/vh/hr, 3 lanes or more, inside shoulder width shall be 12'	PPM	Table 2.1.1
	1-lane ramps	6 ft outside full/4 ft outside paved 6 ft inside full/2 ft inside paved	PPM	Fig. 2.3.1
	2-lane ramps	12 ft outside/10 ft outside paved 8 ft inside full/4 ft inside paved	PPM	Fig. 2.3.1
	partial bridge section			
		3-4 lanes divided highways: 10 ft outside/10 ft min left	PPM	Fig. 2.0.1
		1-lane ramps: 6 ft outside/6 ft left	PPM	Fig. 2.0.1
		2-lane ramps: 10 ft outside/6 ft left	PPM	Fig. 2.0.1
		divided arterial/collector - Urban	PPM	Fig. 2.0.4
	shoulder toll lanes	if additional lanes < 500 ft, 6 ft shoulders throughout	TPPPH	Sec. 2.3

TABLE 10 Roadway Design Criteria Continued

SUBJECT		CRITERIA	REFERENCE	SECTION
Friction Course				
	limited access facilities	extends 8 inches onto paved shoulders	PPM	Sec. 2.3.1
	median shoulders	flush w/travel lane friction course when closed median and shoulder slopes away from barrier wall	TPPPH	Sec. 2.3.1
Rumble Strips				
	ground-in for limited access facilities	skip array on inside/outside shoulders (min. asphalt or shoulders thickness: 2 inches)	PPM TPPPH per std index 518	Sec. 2.3.2 Sec. 2.3.2
		1000 ft of continuous array in advance of bridge	PPM STD	Sec. 2.3.2 Index 518
Roadside Slopes (20 yr AADT > 1500)				
	front slope	fill ht.=0-5ft, 1:6	PPM	Table 2.4.1
		fill ht.=5-10ft, 1:6 to edge of cz then 1:4.	PPM	Table 2.4.1
		fill ht.=10-20ft, 1:6 to edge of CZ then 1:3. Shldr gutter if long slope > 2%	PPM TDMS	Table 2.4.1 Sec. 3.7.2
		fill ht.> 20ft, 1:4 w/guardrail and shldr gutter 1:2 w/guardrail and shldr gutter	PPM TDMS	Table 2.4.1 Sec. 3.7.2
	back slope	1:4 or 1:3 with trapezoidal ditch	PPM	Table 2.4.1
	transverse slopes	1:10 or flatter (freeways); 1:4 (others)	PPM	Table 2.4.1
Borders				
	freeways, incl. ramps	94 ft from edge of travel way to R/W (absolute min: 8 ft)	PPM	Table 2.5.1 Sec. 2.5
Fencing (limited access facilities)				
		fencing required	PPM	Sec. 2.5.1
	Bridges	Fencing required for pedestrian facility over the Turnpike	TPPPH	Sec. 2.12
Grades				
	freeways 70 MPH design speed	max 3% (flat terrain)	PPM	Table 2.6.1
	ramp 35 mph to 40 mph	4-6%	PPM	Table 2.6.1
	ramp 45 mph to 50 mph	3-5%	PPM	Table 2.6.1
	max change w/o VC (70 MPH)	0.20%	PPM	Table 2.6.2
	max change w/o VC (60 MPH)	0.40%	PPM	Table 2.6.2
	max change w/o VC (50 MPH)	0.60%	PPM	Table 2.6.2
	max change w/o VC (40 MPH)	0.80%	PPM	Table 2.6.2
	max change w/o VC (30 MPH)	1.00%	PPM	Table 2.6.2
	ramp plaza approach/departure grade	1% (0.5% min)	TPPPH	Sec. 2.18.3
	straight grade through small plaza	0.5%-1.5%	TPPPH	Sec. 2.18.3
Grade Datum				
	min clearance above DHW elev.			
	freeways	3 ft	PPM	Table 2.6.3
	ramps	2 ft	PPM	Table 2.6.3
	low point on ramps at cross roads	1 ft	PPM	Table 2.6.3

TABLE 10 Roadway Design Criteria Continued

SUBJECT		CRITERIA	REFERENCE	SECTION
Sight Distance				
	min. stopping sight distance			
	grades < 2%			
	mainline 70 mph	820 ft	PPM	Table 2.7.1
	ramps 55 mph	495 ft	PPM	Table 2.7.1
	ramps 35 mph	250 ft	PPM	Table 2.7.1
	grades > 2%	see: PPM Table 2.7.1	PPM	Table 2.7.1
Horizontal Curves				
	max. deflection without horizontal curve			
	V > 45 MPH:	0° 45' 00 "	PPM	Table 2.8.1a
	min. length: Mainline	30V or maximum attainable. (Min. 15V).	PPM	Table 2.8.2a
	max. curvature using 2% cross slopes			
	70 MPH (emax = 0.10):	0° 15'	PPM	Table 2.8.4
	70 MPH (e-NC)	min radius = 14,714 ft.	PPM	Table 2.9.1
Transition Slope Rate				
	Mainline 70 MPH: (8 Lanes)	1:190	PPM	Table 2.9.3
Vertical Curves				
	K value crest curve (V=70 MPH):	506 (Interstate)	PPM	Table 2.8.5
	Min. length crest curve	L=KA. (not to be less than 3 times the design speed)	PPM	Table 2.8.5
	Mainline crest curve length:	1000 ft min. for mainline and 1800 ft. within interchanges)	PPM	Table 2.8.5
	K value sag curve (V=70 MPH): min length crest curve	206 (mainline) L=KA. (not to be less than 3 times the design speed)	PPM	Table 2.8.6
	Mainline sag curve length:	800 ft min. for mainline	PPM	Table 2.8.6
Superelevation				
	Mainline (V=70 MPH)			
		Min 100 ft of full superelevation within curve (urban), 200 ft (rural)	PPM	Table 2.8.2a
		emax = 0.10 dmax = 3o 30'	PPM	Table 2.9.1
	Ramp Transitions		PPM TPPPH	Sec 2.9 Sec 2.9
Shoulder Superelevation				
		emax = 0.10	PPM	Fig. 2.3.1
		emin = 0.03 broken	PPM	Fig. 2.3.1
Superelevation on Reverse Curves				
	location of transition	80% of the transition for each curve located on the tangent (50% min.)	PPM	Sec. 2.8.1.1
	Minimum tangent length	Sum of two 80% distances or greater.	PPM	Sec. 2.8.1.1

TABLE 10 Roadway Design Criteria Continued

SUBJECT		CRITERIA	REFERENCE	SECTION
Vertical Clearance				
	Over travel lanes and shoulder	16 ft - 6 in	PPM	Fig. 2.10.1, Table 2.10.1
	At bridge pier	14 ft (outside clear zone)	PPM	Fig. 2.10.1
	Overhead signs	18 ft (to luminaire)	TPPPH	Sec. 7.2.1
	Signals	17 ft - 6 in	PPM	Table 2.10.3
	DMSs	19 ft - 6 in	PPM	Table 2.10.4
Horizontal Clearance				
	To bridge piers and abutments Flush shoulders	Outside clear zone	PPM	Table 2.11.6
	To guardrail	12 ft for shoulders 10 ft and wider/	STD	Index 400
		shldr width + 2 ft for other shldrs.	STD	Index 400
	To light poles			
	Conventional	Rural (flush shldrs): 20 ft from travel lane;	PPM	Fig. 2.11.2
		14 ft from auxiliary lane (if CZ width < 20 ft, use clear zone width)	PPM	Fig 2.11.2
	High-mast	Outside CZ (unless shielded)	PPM	Fig. 2.11.2
	To utility installations (poles)	At R/W (outside clear zone)	PPM	Table 2.11.3
	To overhead sign supports	Outside clear zone unless shielded	PPM	Table 2.11.1
	Flush shoulders	Outside CZ	PPM	Table 2.11.4
Design Vehicle				
	Standard	WB – 62FL	PPM	Sec. 1.12
	Parking lots/service plazas	SU	n/a	n/a
Clear Zone Width				
	20-yr AADT greater than/equal to 1500, travel lane and multi-lane ramps > 55 MPH:	36 ft from edge of traveled way	PPM	Table 2.11.10
	Auxiliary lanes & single-lane ramps > 55 MPH: 45 to 50 MPH: < 45 MPH:	24 ft from edge of traveled way 14 ft from edge of traveled way 10 ft from edge of traveled way	PPM PPM PPM	Table 2.11.10 Table 2.11.10 Table 2.11.10
LA R/W at Interchanges				
	Crossroads overpassing limited access facilities	Extends 100 ft along crossroad from mainline R/W line for urban interchanges	PPM	Sec. 2.14.1
Toll-Lane Design Queue				
Toll Plaza Horizontal Taper Rates	10- 14 lanes (and ramp plazas)	20:1	TPPPH	Sec. 2.18.1
Toll-Lane Design Queue				
	Ramp plazas	150 ft	TPPPH	Sec. 2.18.5
Min. Distance Between Booth and Crossroads				
		300 ft	TPPPH	Sec. 2.18.5
Sod				
		All disturbed areas	TPPPH STD	Sec. 2.19 Index 105

ABBREVIATIONS:

PPM	*Plans Preparation Manual, Vol. I - FDOT*
TPPPH	*Plans Preparation and Practices Handbook, Vol. I – Florida's Turnpike Enterprise/FDOT A Policy on Geometric Design of Highways and Streets*
AASHTO	American Association of State Highway and Transportation Officials
STD	State of Florida Department of Transportation Design Standards
TDMS	Turnpike Drainage Manual Supplement 2008

4.1.2 Drainage Design Criteria

Design and construction criteria for the proposed improvements will adhere to FDOT Standards for the design of such roadways and will comply with the recommended standard practices as set forth in **Table 11**. Please note that that additional criterion may be found in the Turnpike Plans Preparation and Practices Handbook (TPPPH), FDOT Drainage Manual, FDOT Plans Preparation Manual and the Drainage Manual Supplement.

This section of the Florida's Turnpike (at the Minneola Interchange) is jurisdictionally within the St. John's River Water Management District (SJRWMD) and hydrologically within the Lake Apopka Drainage Basin. Lake Apopka is an impaired waterbody in a land-locked hydrologic basin.

The proposed stormwater management plan and drainage design will be in accordance with the Florida's Turnpike and the SJRWMD stormwater drainage criteria. The design will meet the criteria from these governing agencies, while minimizing the required right-of-way and providing a viable economic design to provide stormwater management and drainage conveyance for this project. Additional regulations which govern the stormwater management design for the Minneola Interchange include: National Pollutant Discharge Elimination System (NPDES), implemented by Florida Department of Environmental Protection (FDEP), and the National Flood Insurance Program, implemented by Federal Emergency Management Agency (FEMA).

4.1.2.1 SJRWMD Criteria

A Standard Environmental Resource Permit (ERP) (Chapter 40C-40) will be required for the construction of the Minneola Interchange. At this time, it is anticipated that wetlands will not be disturbed and that the project size is under 100 acres. The requirements for a land-locked basin are as follows:

Water Quality

The stormwater ponds on this project are expected to be dry retention ponds because all of the soils in the area are Type A soils. Due to Lake Apopka being an impaired water basin the stormwater design of this project will have to demonstrate that the proposed stormwater system will not result in discharges that may cause or contribute to violations of state water quality standards for nutrients. Nutrient loading calculations will be required to demonstrate a reduction in nutrient loading in the post-development condition. These calculations include the total phosphorus loading to Lake Apopka. The stormwater management design must provide reasonable assurance of compliance with the total phosphorus discharge limitations and comply with relevant monitoring requirements.

Treatment volume requirements will be calculated by multiplying the impervious area by four inches of rainfall. This is water quality presumptive criteria used in the Lake Apopka Basin. The treatment volume is required to recover within 72 hours.

Water Quantity

Since the project is within a closed basin, the stormwater ponds will need to be sized to hold the difference between the post-development and pre-development runoff for the 25-year 96-hour storm. This volume is required to recover within 14 days.

Table 11 Drainage Design Criteria

CRITERIA	REFERENCE	SECTION	
Design Frequency storm sewer cross drains	10-year recurrence interval 50-year return period	D.M.	3.3 4.3
Hydrologic Analysis (Stormsewer)	rational method	S.D.	2.0
Minimum Velocity	2.5 ft/sec physical slope, pipes flowing full, and pipes above water table	S.D.	4.2.1
Pipe Material	Optional culvert materials shall be considered for all culvert applications. Based on *FDOT Optional Pipe Handbook*.	T.D.M.S. D.M.	6.5 6.5
Mannings "n" Coefficient concrete pipes asphalt (smooth finish)	0.012 (all pipe sizes) 0.013	D.M. D.M.	3.6.4 Table 2.2
Design Tailwater Storm Sewer System	Conditions vary with outfall	D.M.	3.4
Storm Sewer Freeboard	Min. 1'-0" between gutter flow line and hydraulic grade line (10 yr. design event - Freeway)	S.D.	5.0
Pipe Size And Length trunk line length between structure	18" dia. (min.) 18" pipe = 300 ft. 24" to 36" pipe = 400 ft. 42" and up = 500 ft.	D.M.	3.10.1
Time Of Concentration (TOC)	Min. TOC of 10 minutes to first inlet.	D.M.	3.5.1
St. John's River Water Management District Treatment Volume	Please see the description below in the SJRWMD Criteria section.	Standard Environmental Resource Permit (Chapter 40C-40)	
Pipe Slopes	Max. 10% to 15% with a max. hydraulic gradient to produce a velocity of approximately 10 ft/sec min. slope that will produce a 2.5 ft/sec velocity when flowing full	T.D.M.S. D.M.	3.6.1 3.6.1
Detention/Retention Ponds	1.0 ft freeboard above peak design stage	Standard Environmental Resource Permit (Chapter 40C-40) D.M. & T.D.M.S.	
Longitudinal Gutter Grade	0.3% minimum	D.M.	3.8.1

ABBREVIATIONS:
D.M. *FDOT Drainage Manual 2010*
S.D. *FDOT Drainage Handbook Storm Drains 2008*
T.D.M.S. *Turnpike Drainage Manual Supplement 2008*
TPPPH *Turnpike Plans Preparation and Practice Handbook*

4.1.2.2 Florida's Turnpike Criteria

Water Quantity

- The project is in a closed basin. Therefore, the water quantity requirement for Florida's Turnpike is that the stormwater management system is large enough to ensure that the post developed discharge volumes do not exceed the pre-developed discharge volumes for the critical duration (1-hour through 10-day) storm.

- Discharge volumes shall be determined for various rainfall frequencies up to the 100-year storm.

- Half of the retention volumes should recover in seven days, and the total retention volume should recover in 30 days.

- The design of stormwater management systems shall comply with the water quality, rate, and quantity requirements of Chapter 14-86, F.A.C.

Pond Criteria

- For proper maintenance of the pond, a minimum 20 foot horizontal sodded berm is required on each pond.

- The corners of the pond shall be rounded with a suitable turning radius for maintenance equipment.

- At least one foot of freeboard above the design stage is required.

- Fencing and entry gates are required for ponds having slopes steeper than 1:4 (V:H).

Cross Drain Criteria

The FDOT cross drain handbook and the Federal Highway Administration Hydraulic Design of Highway Culverts will be used to design culverts on the project. For culverts on an interstate highway the design frequency to be used is 50 years. The highest tailwater elevation expected for the 50 year design storm is to be used. Calculations will also be provided for the 100-year and the 500-year storms, per FDOT Drainage Manual section 4.2 (3).

Conveyance Criteria

Roadside swales will be designed in accordance with the FDOT drainage manual, to convey stormwater flow from Florida's Turnpike. The swales will be designed using a design frequency of 10 years. Proposed ditches will be designed where existing ditches conveyed runoff. The minimum slope to be used in the swales is 0.0005 ft/ft. The geometrical design of open channels will be in accordance to the roadside safety and clear zone requirements.

Storm drains will be designed in accordance with the FDOT storm drain manual to convey stormwater flow from the Minneola Connector. The design frequency used to size the stormwater pipes will be 10-year. The minimum size to be used is 18". The maximum length for 18" to 24" pipes is 300 feet and 400 feet for any larger pipe. An optional culvert materials analysis will be evaluated to determine performance characteristics such as durability, structural integrity and hydraulic capacity.

Spread will be designed using a rainfall intensity of 4.0 inches per hour. For design speeds of 45 mph and less, spread can encroach into half the width of the first lane. For design speeds between 45 and 55 mph, 8 feet of the lane needs to be maintained clear of spread. For design speeds in excess of 55 mph, no spread encroachment is allowed. For sections with a full width shoulder, spread cannot encroach onto the travel lane.

For sections with shoulder gutter, the spread resulting from the 10-year storm shall not exceed 1' 3" outside the gutter in the direction toward the front slope.

4.1.2.3 NPDES Criteria

Effective sediment and erosion controls must be employed for construction activities that have one or more acres of exposed soils. Included in the permit submittal will be the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP shows an engineering design of erosion control structures to control stormwater discharges off of the site.

4.2 ALTERNATIVES CONSIDERED

4.2.1 No-Build

The No-Build alternative does not propose a new interchange with Florida's Turnpike at Milepost 279. The No-Build alternative does include widening of Florida's Turnpike from four (4) to eight (8) lanes. The design and construction of the widening project is currently not funded or programmed in the current FDOT 5-year Work Program.

Additionally, the traffic demand modeling performed by FTE for Year 2035 for the No-Build alternative assumed that Hills of Minneola Development of Regional Impact (DRI) would not proceed beyond Phase 1. Therefore, only land use consistent with Phase 1 of the Hills of Minneola DRI was included in the traffic model and reflected in the No-Build forecast.

Advantages of the no-build alternative:

- No expenditure of funds for construction
- No environmental impacts
- No right-of-way needs

Disadvantages of the no-build alternative:

- Not consistent with the Lake-Sumter MPO LRTP
- Increased local road congestion with corresponding increases in air pollutants
- Increased congestion on parallel roadways, including CR 455, a scenic highway
- Potential increase in crash rates due to increased congestion
- No interchange will be built and mobility options/route choices will be unimproved

4.2.2 Transportation Systems Management (TSM)

Transportation Systems Management (TSM) alternatives involve low capital cost transportation improvements designed to maximize the use and efficiency of the existing transportation facility through improved system management. Various forms of TSM improvements can include:

- Traffic signal improvements
- Intersection/Interchange Improvements
- Widening of parallel routes
- Ridesharing programs
- Transit
- Intelligent Transportation Systems (ITS)
- Auxiliary lanes
- Demand management
- Local roadway system network improvements
- Other modes

The additional capacity and connectivity required to accommodate the projected traffic volumes on Florida's Turnpike and anticipated land uses around the proposed interchange cannot be provided solely through the use of TSM improvements. However, the use of TSM measures are not precluded by the

build alternative and several of these strategies are components of the area's cost feasible transportation plans.

Although some TSM alternatives are planned for the region, the benefits of these alternatives are generally in the 5-10% range. These improvements will not meet the demand projected on the Florida's Turnpike or provide adequate support for the land uses approved through the regional process. Therefore the build alternative with the proposed geometric configuration is the preferred alternative.

Although detailed analysis was not prepared for these alternatives, a discussion of the issues pertaining to them is included subsequently in section 4.3, Evaluation of Alternatives.

4.2.3 Build Alternatives

Several interchange configurations were considered for Milepost 279 including several combinations of diamond or cloverleaf ramps for the various quadrants of the interchange. Review of the projected roadway volumes indicated that the preferred build alternative included diamond ramps in 3 of the 4 locations with a cloverleaf ramp indicated for the northwest quadrant of the interchange (assuming the Turnpike is oriented in a north-south direction). A detailed discussion of the benefits of this geometric configuration may be found in section 5.1. Refer to **Appendix A** for the typical section package, **Appendix B** for the proposed interchange configuration, and **Appendix C** for the preferred alternative.

Advantages of the build alternative:

- Meets the Lake-Sumter MPO LRTP
- Reduced regional traffic along parallel routes like US 27, SR 50 and CR 455, a scenic highway
- Decreased carbon monoxide (CO) emissions
- Increased network connectivity in the area, reducing the vehicle miles traveled (VMT) per capita.
- Consistent with the conditions of the approved DRI for the Hills of Minneola.
- Provides another access point on the Turnpike for the residents of Minneola and areas located in unincorporated Lake County such as Astatula and Sugarloaf. This will also provide relief to the existing SR 50/Clermont interchange as well as improves evacuation times during hurricane and other emergencies
- Anticipated to provide relief to both the SR 50/Clermont and the Leesburg South/US 27

Disadvantages of the build alternative:

- Construction cost outlay
- Inconvenience to the traveling public during construction
- Minimal environmental impacts

4.3 EVALUATION OF ALTERNATIVES

Build vs. No-Build Alternatives: Because of the assumptions regarding land use inherent in the models generated by the FTE, volumes on the primary arterials in this area (US 27 and SR 50) are largely unchanged between the build and no-build scenario. However, through traffic volumes on collector roads in the vicinity, such as CR 455 which has been designated as a scenic highway, will be relieved by construction of the interchange. Overall, construction of the interchange will increase network connectivity in the area, thereby reducing VMT and CO emissions. Construction of the proposed Minneola Interchange will relieve the demand projected for the existing interchanges north and south of the proposed location. These existing interchanges also show significant decreases in the affected ramp volumes with the proposed interchange located approximately at Milepost 279. The projected Turnpike volumes north of the proposed interchange are similar in the build and no-build scenario. However, the Turnpike volume south of the interchange increased by approximately 32,000 vehicles per day in the peak season.

The construction of this interchange was identified as a Development Order (DO) condition required by the developer of the Hills of Minneola DRI prior to commencing their second phase of development. The first phase of the DRI includes a limited amount of residential development. Additional development in

the area could also be constructed but would be limited by concurrency issues due to existing and projected limitations in the roadway network. Please see **Table 12** for a matrix summary of the build vs. no-build alternatives.

Table 12 Interchange Build vs. No-Build Evaluation Matrix

	No-Build Alternative	Build Alternative
ENGINEERING		
Functional Relationship with Turnpike Mainline	The travel demand estimates for the Turnpike Mainline indicate the need for an eight-lane typical section in Design Year.	The project traffic estimates prepared for the interchange indicate that the Mainline volumes will increase with the project but will not exceed the 8-lane design capacity.
Structures	No Impacts	The proposed interchange will include a new bridge across the Mainline. The design of the proposed interchange does not require modification to Mainline structures.
Evacuation	No Improvements	Construction of the interchange will improve evacuation for area residents and visitors.
Utilities	No Impacts	Several utilities exist and run parallel or intersect the Turnpike in the study area. Coordination through the design process will be necessary to address requirements for modification or relocation.
SOCIOECONOMIC		
Right-of-Way/Relocation	No Impacts	Right-of-way for the proposed interchange will be dedicated by the single owner that controls all lands needed. There will be no residential or business relocations.
Community Service	No Impact	The construction of the proposed interchange will provide new access to property to/from the east and west side of the Turnpike. Police, fire and rescue response times will be improved.
Parks/Recreation Areas	No Impacts	The interchange will not have direct impact to any parks or recreation areas. The interchange will provide additional access to designated scenic highways in the vicnity.
Compatibility with Local Plans	Not consistent with the City of Minneola Comprehensive Plan or the Lake-Sumter County MPO Long-Range Transportation Plan.	Consistent with all local plans.
ENVIRONMENTAL		
Wetlands/Surface Waters	No Impacts	The project does not have any direct or secondary impacts to jurisdictional wetlands or surface waters.
Threatened & Endangered Species	No Impacts	One state-listed wildlife species, the gopher tortoise, is known to occur on-site. Impacts to gopher tortoises and their burrows must be permitted with the Florida Fish and Wildlife Conservation Commission (FFWCC) prior to development. There are several approved off-site recipient sites within the FFWCC required 100-mile radius that could accept the population of gopher tortoises within the proposed interchange footprint.
Air	No Impacts	The results of the air quality screening test are below the National Ambient Air Quality Standards (NAAQS) for carbon monoxide. Therefore, the proposed project will not cause violations of the NAAQS and will not have a significant impact on air quality conditions.

Table 12 Interchange Build vs. No-Build Evaluation Matrix

	No-Build Alternative	Build Alternative
Noise	No Impacts	The results of the noise study indicated that there will be no noise impacts as a result of the proposed interchange. This is due, primarily, to a commitment by the developer to locate residential development 500 feet away from the designated Florida's Turnpike right-of-way.
Floodplain	No Imapcts	According to the Federal Emergency Management Agency (FEMA) and the Flood Insurance Rate Maps (FIRM) for Lake County, the project is not located in the 100 year floodplain. There are no anticipated floodplain encroachment impacts due to the construction of this highway interchange. Roadway profiles will be established above the 100-year floodplain elevation of adjacent water bodies so that the travel lanes will not be flooded during the storm event and can remain open for emergency vehicles and evacuations.
Cultural	No impacts	Coordination with the State Historic Preservation Office (SHPO) revealed that the proposed interchange will not impact any archaeological or historical sites listed on or eliglble for the National Register of Historic Places.
STUDY OBJECTIVES		
Provide additional access to Florida's Turnpike	No	Yes
Reduce regional traffic along roadway segments parallel to Florida's Turnpike	No	Yes
Meets the objectives of the Lake-Sumter Metropolitan Planning Organization (MPO) Long Range Transportation Plan (LRTP)	No	Yes
PROJECT COSTS		
Roadway Construction	$0	$28.94 million (2011 dollars)
Bridge Construction	$0	$4.76 million
Right-of-Way Acquisition	$0	$0 ($7.15 million estimated value of dedication)
TOTAL PROJECT COST	$0	$33.7 million

5.0 PREFERRED ALTERNATIVE

5.1 PREFERRED INTERCHANGE ALTERNATIVE

The Preferred Alternative for the Minneola Interchange at Florida's Turnpike represents a single build alternative resulting from a DO associated with the Hills of Minneola DRI. The interchange includes diamond ramps in conjunction with a partial cloverleaf arrangement. This design concept is the Preferred Alternative based on the following:

- Proposed ramp configuration provides adequate storage for future traffic projections,
- Driver's expectations to reenter the Turnpike from the Hancock Road Extension are met. Traffic traveling northbound and southbound on the Turnpike can exit at the Hancock Road Extension and return to the Turnpike to reconvene their trip,

- The design can be accommodated within the land controlled by the DRI, and
- The proposed design will have no significant impacts on the human or natural environment.

Appendix C depicts the preferred alternative. Right-of-way has been reserved for loop ramps in both the northwest and the southeast quadrant (assuming the Turnpike is oriented in a north-south direction) if future volumes necessitate upgrades to the diamond ramp currently planned in the southeast quadrant.

5.2 HORIZONTAL AND VERTICAL ALIGNMENT

The proposed horizontal alignment does not modify the existing alignment that is described in Section 3.1.4. Through the project limits, the horizontal alignment is relatively straight, with only one horizontal curve situated northeast of the proposed interchange. The radius of this curve will remain as in existing conditions.

The proposed vertical alignment of the Turnpike will remain as in existing conditions. The Hancock Road Extension bridge span over the Turnpike will meet the FDOT vertical clearance design requirement.

5.3 TYPICAL SECTIONS

The recommended typical sections for this interchange development project were created to follow design criteria as stated in A Policy on Geometric Design of Highways and Streets (AASHTO, 2001) and FDOT's Plans Preparation Manual (January 2011).

Florida's Turnpike Mainline

Within the limits of the proposed interchange, Florida's Turnpike is planned, for the future, to be an eight-lane divided freeway with a 26 foot median in the future. The median area includes 12 foot paved shoulders in each direction and a 2 foot concrete barrier wall separating directional traffic. Each travel lane on Florida's Turnpike is 12 feet in width. The paved shoulder on each side of the Turnpike is 10 to 12 feet with a 36 foot clear zone as detailed in **Appendix A**. The design speed for this typical section is 70 mph and will require a minimum of approximately 300 feet of right-of-way.

Florida's Turnpike Under Bridge

The typical section for Florida's Turnpike under the Hancock Road Extension Bridge is planned as a future eight-lane divided freeway on the mainline section. In addition, a concrete barrier wall and additional paved shoulder is provided adjacent to the outside Southbound travel lane to separate mainline traffic from entrance Ramp E traffic. The design speed is 70 mph with a total right-of-way width of 300 feet.

Hancock Road Extension

The Hancock Road Extension is planned as a six-lane divided arterial (at the interchange approaches) with a raised median separation of 22 feet in width. The travel lanes are each 12 feet wide. Pavement cross slope is 0.02 ft/ft for the two inside lanes in each direction and 0.03 ft/ft for each outside travel lane. Five-foot concrete sidewalks are provided on both sides of the Hancock Road Extension. A 3-foot sod strip (parkway) separates the back of the Type F curb and the sidewalk. Approximately 282 feet of right-of-way is required for this section. The design speed is 45 mph.

Hancock Road Extension – Turnpike Bridge

The bridge typical section consists of a five-lane divided section with two travel lanes eastbound, three travel lanes westbound. A 10 foot outside shoulder is provided along with a 22 foot concrete median. All travel lanes are 12 foot in width and the entire pavement cross slope is 0.02 ft/ft. Adjacent to the eastbound outside shoulder is a 5 foot sidewalk protected by a 32" F-shape concrete traffic railing barrier. Pedestrians are also protected within the sidewalk by a fully

enclosed fencing that extends from the back of the traffic barrier to the top of a 27 inch concrete parapet. The bridge width is 111 feet – 1.75 inches. The design speed is 45 mph.

Interchange Ramps A, C, D, & E

The typical section for entrance/exit ramps A, C, D & E is a single 15 foot travel lane with a 4 foot paved shoulder to the outside and 2 feet of shoulder pavement on the inside of the ramp. The cross slope of the ramp feeds interior to the interchange into water bodies of varying depth and width. The design speed on these ramps is 35 mph.

Interchange Ramp B

Northbound Turnpike exit ramp, Ramp B, is a two-lane, 24 foot wide travel way with a 0.02 ft/ft cross slope. A 10 foot paved shoulder is provided on the outside; 4 feet of shoulder pavement on the inside part of the ramp. As with the other interchange ramps, stormwater flows to the interior of the interchange into a collection system. The design speed of Ramp B is 35 mph.

5.4 DRAINAGE

Florida's Turnpike, FDOT, and the SJRWMD stormwater criteria described previously, will be utilized in the proposed stormwater management plan and drainage design. The treatment of stormwater runoff from the new roadways will primarily occur in five dry retention ponds located within the proposed roadway ramps. The five dry retention ponds will meet the applicable requirements described above. Existing drainage patterns will be maintained on Florida's Turnpike, and any offsite runoff will be bypassed through the project. Off-site runoff and project runoff will not be commingled.

In the preliminary stormwater analysis, basin areas were calculated for the 5 stormwater management ponds proposed at the interchange. Using areas and percent impervious, the runoff curve number was calculated. Lastly, the 25 year-96 hour runoff volume was calculated for each basin. The volumes obtained from these calculations were used to estimate and grade preliminary pond sizes for each basin. Please see the drainage map included as **Figure 4**. The preliminary drainage calculations are found in the Preliminary Stormwater Report.

The dry retention ponds will provide water quality and attenuation for the entire Florida's Turnpike in the vicinity of the interchange and the new roadway and ramps. The ponds will recover the entire volume through water percolation into the ground. The total difference between pre-development and post-development retention volume for the project is approximately 62 acre-feet. The five dry retention ponds will provide approximately 100 acre-feet of volume combined. Although the SJRWMD only required retention of the difference between the pre- and post development runoff volumes for the 25-year 96-hour storm, the ponds will retain the volume of the 100-year 96-hour storm. Pond grading and tying-in to adjacent ground will need to be finalized to determine the final volume calculations. In addition, pond recovery will need to be based on a comprehensive model to determine good water percolation.

The rainfall depths assumed from the FDOT Drainage Manual to calculate volumes are as follows:

10-year/24-hour = 7.4 inches
25-year/24-hour = 8.4 inches
25-year/96-hour = 11.5 inches

In the proposed Florida's Turnpike condition, a system consisting of roadside swales that convey runoff to the dry retention ponds is proposed. At the limits of the project, roadside swales will provide some attenuation and water quality. The limits of the Turnpike on both sides are at lower elevations that cannot convey runoff back to the higher elevations of the ponds. These roadside swales will tie back into the existing roadside swales. Please see the drainage map in **Figure 4**.

In the proposed condition, the Hancock Road Extension will have a stormsewer conveyance system to convey roadway runoff to the proposed dry retention ponds. Near the limits of the Hancock Road Extension project, on both the north and south ends, the elevations are lower than the proposed ponds. It

Figure 4 Drainage Map

will not be possible to convey runoff back to the higher elevations of the ponds. At the limits of the project, the storm sewer system will convey runoff towards ponds on adjacent properties instead of to the ponds at the highway interchange. The overall drainage patterns are shown on the drainage map in **Figure 4.**

Additional considerations in the proposed design are the steep gradients within the project. High velocities of runoff that may cause erosion and soil losses will be mitigated during proposed design.

5.5 BRIDGE ANALYSIS

The Hancock Road extension bridge over the Turnpike is proposed as a three-span, precast, pre-stressed concrete beam bridge. The bridge will span the clear zones, 24 feet outside the southern ramp lane and 36 feet outside of the northern travel lane, for an approximate bridge length of 282 feet. The span configuration will be approximately 62 feet, 95 feet and 125 feet (measured along a 55.1 degree skew) with multi-column piers to support the spans. The overall bridge width will be 111feet -1.75 inches.

The superstructure will be composed of an 8 ½" cast-in-place (CIP) concrete deck on Florida I-Beams. The use of Florida I-Beams (FIB) is per the FDOT Structures Design Bulletin dated June 2, 2009. The design bulletin includes design resources for estimating beam span and spacing configurations. Per the design bulletin, it is estimated that FIB-45 beams will be used for each span.

Assumptions of industry standard dimensions were made for the substructure components including; end bent and pier caps, columns, and footings. The use of precast, pre-stressed concrete square piles (18" square piles were used for the cost estimation) is anticipated. The number of columns and piles for the bents and piers are based on the spacing of piles for similar bridge configurations of previous projects.

5.6 DESIGN TRAFFIC AND ANALYSIS

For more information about the interchange evaluation please refer to the IJR.

5.6.1 Mainline

Table 13 summarizes the projected traffic volumes for the opening year, 2015 and the design year, 2035.

Table 13 – Projected Traffic Volumes

	Opening Yr, 2014/15		Design Yr, 2035	
Location	Daily	DDHV	Daily	DDHV
Turnpike Mainline				
Leesburg South (US 27) to Minneola	62,400	3,900	91,400	5,760
Minneola to Clermont (SR 50)	83,400	5,200	124,800	7,810
Turnpike Ramps				
Northbound off			18,600	2,290
Southbound on			18,600	1,840
Northbound on			1,900	240
Southbound off			1,900	190
Hancock Road Extension				
East of the Turnpike			37,700	2,420
West of the Turnpike			33,900	2,230

5.6.2 Intersection Concepts and Signal Analysis

The analyses to evaluate the operations of the proposed Turnpike interchange were evaluated using forecasted volumes for 2035 as a partial cloverleaf. The analyses were based on system traffic forecasts prepared by FTE and including land use data used in the Hills of Minneola DRI traffic analysis. All

analyses were conducted for the design hour. Electronic toll plazas are assumed for the NB off-ramp and the SB on-ramp.

For the 2035 PM peak-hour arterial analysis, the Hancock Road extension is expected to operate at LOS C in both directions in the impact area of the interchange. The signalized intersections at the interchange show acceptable operations with level of service B at both locations. The intersection capacity utilization (ICU) at the northbound off-ramp is 75% with a corresponding ICU LOS of D. At the southbound off-ramp, the ICU is 63.4% with an ICU LOS of B.

Queues at these intersections vary considerably by movement. On the northbound off-ramp, the 95% queue extends 474 feet on the off-ramp approach. Along the Hancock Road extension, the longest queue during the PM peak-hour is 324 feet in the southbound through movement. On the southbound off-ramp, the 95% queue shown for the ramp approach is only 151 feet. On the Hancock Road extension, the longest queue is in the northbound approach (335 feet). Each of the lane length requirements to accommodate these queue lengths have been incorporated into the preferred alternative design.

5.7 ACCESS MANAGEMENT DESIGNATION

The FDOT Access Management Guidelines Rule 14-97 lists the minimum spacing requirements for freeway interchanges based on the access class. The proposed interchange spacing meets the requirement of six miles from the adjacent interchange for the Area Type 4 Classification. Additionally, all access management requirements have been met at the Hancock Road extension approaches.

5.8 PEDESTRIAN AND BICYCLE FACILTIES

Pedestrian facilities will be provided on the Hancock Road extension bridge consistent with the bicycle and pedestrian facilities in the surrounding area. Pedestrian features will be provided at all signals designed as part of this interchange. Pedestrian and bicycle traffic is not permitted on Turnpike facilities.

5.9 RIGHT OF WAY REQUIREMENTS

Right-of-way for the Interchange construction will be donated by the developer of the property adjacent to the new interchange. This donation includes 106 acres of land, 54 acres on the northeast side of the Turnpike and 52 acres on the southwest side.

5.10 UTILITIES AND LIGHTING

There are several utilities located in the project area that intersect or run parallel to the Turnpike. Utility owners were contacted and requested to submit design plans of their existing and planned facilities along the project area. Utility coordination efforts with the utility owners will be a continual effort to minimize impacts and to complete any required relocations prior to roadway construction. The final design plans will be updated as the utility coordination plans are supplied by the utility companies.

There is currently no lighting along the project corridor. A lighting justification analysis will be performed during the final design phase to determine the extent, if any, lighting is required.

5.11 AESTHETICS AND LANDSCAPING

Landscaping and aesthetic features will be determined as a part of the final design. The design team will work with the City of Minneola to identify any “gateway” features that would be funded by the City.

5.12 INTELLIGENT TRANSPORTATION SYSTEM (ITS)

A Vehicle Detection System and the closed-circuit television (CCTV) Camera and Fiber System run parallel to the southbound lanes along the Turnpike mainline and were constructed under FN No. 406123-1-52-01 and 406120-3-52-01, respectively. During the final design phase, plans will be prepared that will address maintenance of the system and any required relocations during construction. The ITS

Deployment Manager will be the point of contact during the final design phase. The current ITS Deployment Manager can be reached as follows: phone: 407-264-3845, e-mail: paul.mannix@dot.state.fl.us for additional information.

5.13 SPECIAL FEATURES

Retaining walls will most likely be required along portions of the proposed ramps, however, proposed grading for the development has not been designed and wall locations will not be determined until final grading of the site has been completed.

5.14 PRELIMINARY TRAFFIC MANAGEMENT PLAN

The traffic management plan for the construction of the interchange and bridge is expected to be conducted in two phases. Traffic will be shifted toward the median while constructing the interchange ramps. To construct the bridge piers in the median, traffic will be shifted to the outside of existing mainline lanes.

Improvements to the Turnpike are not included in this project other than those required to construct the proposed ramps to address the future mainline typical sections.

5.15 VALUE ENGINEERING SUMMARY

The current funding strategy does not require FTE to contribute greater than $20 million. If FTE contribution exceeds $20 million a Value Engineering (VE) study will be required.

5.16 PRELIMINARY ENGINEERING COSTS

The total preliminary engineering cost for the Minneola Interchange at Florida's Turnpike project is estimated to be $1.89 million.

5.17 RIGHT OF WAY COSTS

All necessary right-of-way to construct the interchange will be donated by the owners of the Hills of Minneola DRI. This donation is estimated to include approximately 106 acres with a value of $7.15 million based on a recent appraisal prepared for the land acquisition related to the new Minneola High School.

5.18 CONSTRUCTION COSTS

The construction costs for the Hancock Road extension bridge is estimated to be $4.76 million and the roadway elements for the new interchange are estimated to be $28.94 million. Total project construction costs are estimated to be $33.7 million.

6.0 SUMMARY OF ENVIRONMENTAL IMPACTS

Please refer to the SEIR for a summary of environmental impacts.

7.0 SUMMARY OF PERMITS AND MITIGATION

Please refer to the SEIR for proposed permits and mitigation.

8.0 SUMMARY OF PUBLIC INVOLVEMENT

Please see the Public Involvement Report for a summary of meetings conducted. The Public Hearing Transcript is included as **Appendix D.**

APPENDIX A

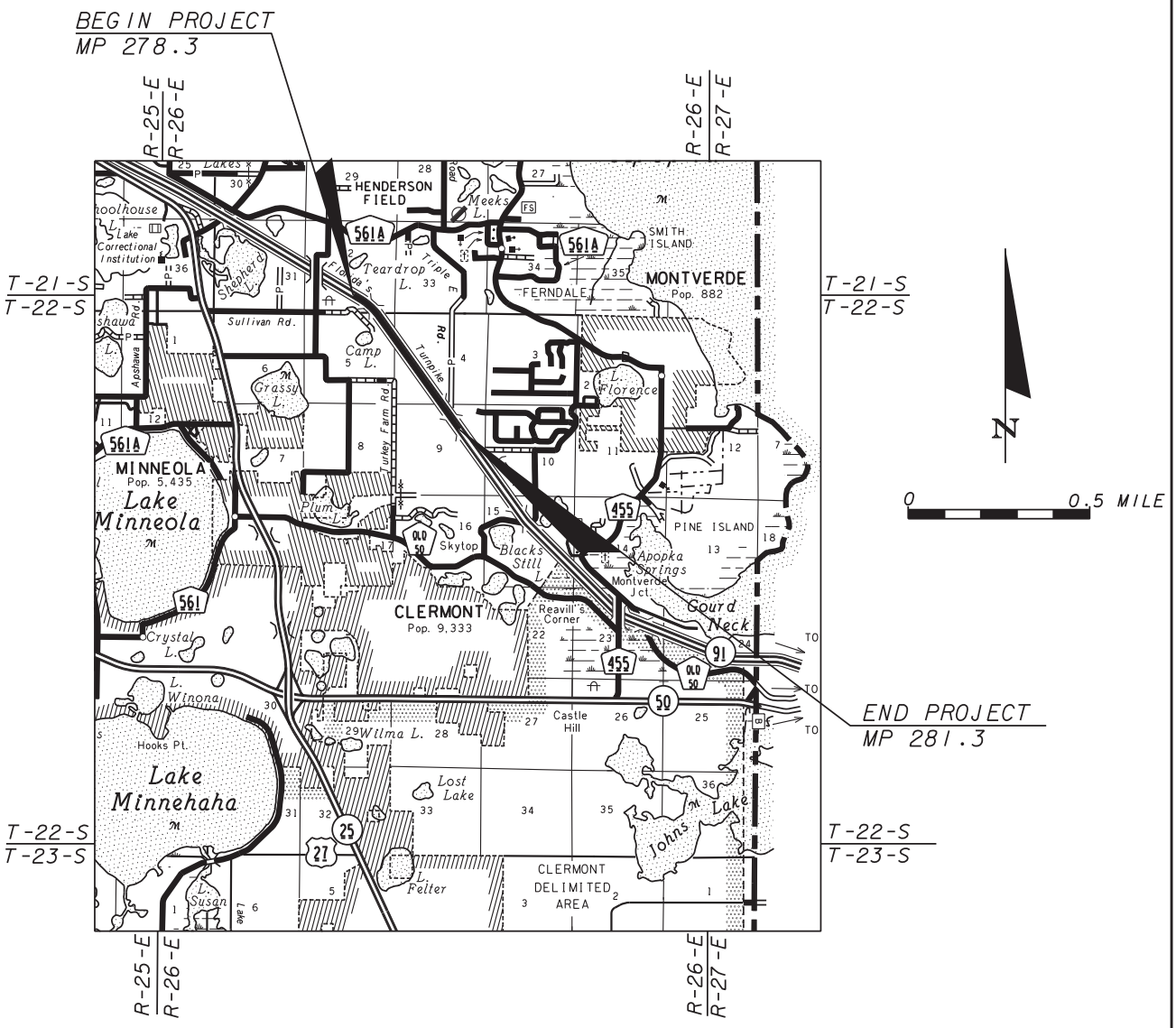
STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION PACKAGE

MINNEOLA INTERCHANGE

LAKE COUNTY



PREPARED BY:

Vanasse Hangen Brustlin, Inc.
Transportation, Land Development,
Environmental Services
225 E. Robinson St., Suite 300
Landmark Center Two
Orlando, FL 32801 (407)839-4006
Certificate of Authorization # 3932

Mark F. Bertoncini, P.E.
PE # 63437

OCTOBER, 2011

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID: N/A COUNTY (SECTION): LAKE

PROJECT DESCRIPTION: HILLS OF MINNEOLA INTERCHANGE MP 279.40

PROJECT CONTROLS

FUNCTIONAL CLASSIFICATION

(X) RURAL
( ) URBAN

(X) FREEWAY/EXPWY. ( ) MAJOR COLL.
( ) PRINCIPAL ART. ( ) MINOR COLL.
( ) MINOR ART. ( ) LOCAL

HIGHWAY SYSTEM

Yes	No	
(X)	( )	NATIONAL HIGHWAY SYSTEM
(X)	( )	FLORIDA INTRASTATE HIGHWAY SYSTEM
(X)	( )	STRATEGIC INTERMODIAL SYSTEM
(X)	( )	STATE HIGHWAY SYSTEM
( )	(X)	OFF STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

(X) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
( ) RRR INTERSTATE / FREEWAY
( ) RRR NON-INTERSTATE / FREEWAY
( ) TDLC / NEW CONSTRUCTION / RECONSTRUCTION
( ) TDLC / RRR
( ) MANUAL OF UNIFORM MINIMUM STANDARDS (FLORIDA GREENBOOK)(OFF-STATE HIGHWAY SYSTEM ONLY)

TRAFFIC

	YEAR	AADT
CURRENT	2009	41,835
OPENING	2015	83,400
DESIGN	2035	124,800

DESIGN SPEED: 70
POSTED SPEED: 70

DISTRIBUTION
K 10.28%
D 52.81%
T_{24} 14.47%

DESIGN SPEED APPROVALS

_____ _____
DISTRICT DESIGN ENGINEER DATE

_____ _____
DISTRICT TRAFFIC OPERATIONS ENGINEER DATE

LIST ANY POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION ELEMENTS:

N/A

LIST MAJOR STRUCTURES LOCATION/DESCRIPTION - REQUIRING INDEPENDENT STRUCTURE DESIGN:

NEW BRIDGE OVER TURNPIKE AT APPROX. MP 279.40

LIST MAJOR UTILITIES WITHIN PROJECT CORRIDOR:

AT&T
BRIGHT HOUSE NETWORKS, LLC
CITY OF MINNEOLA
COMCAST CABLEVISION
EMBARQ
ORLANDO UTILITIES COMMISSION (LIGHTING)
PROGRESS ENERGY
SUMTER ELECTRIC COOPERATIVE, INC.
TRAFFIC CONTROL DEVICES

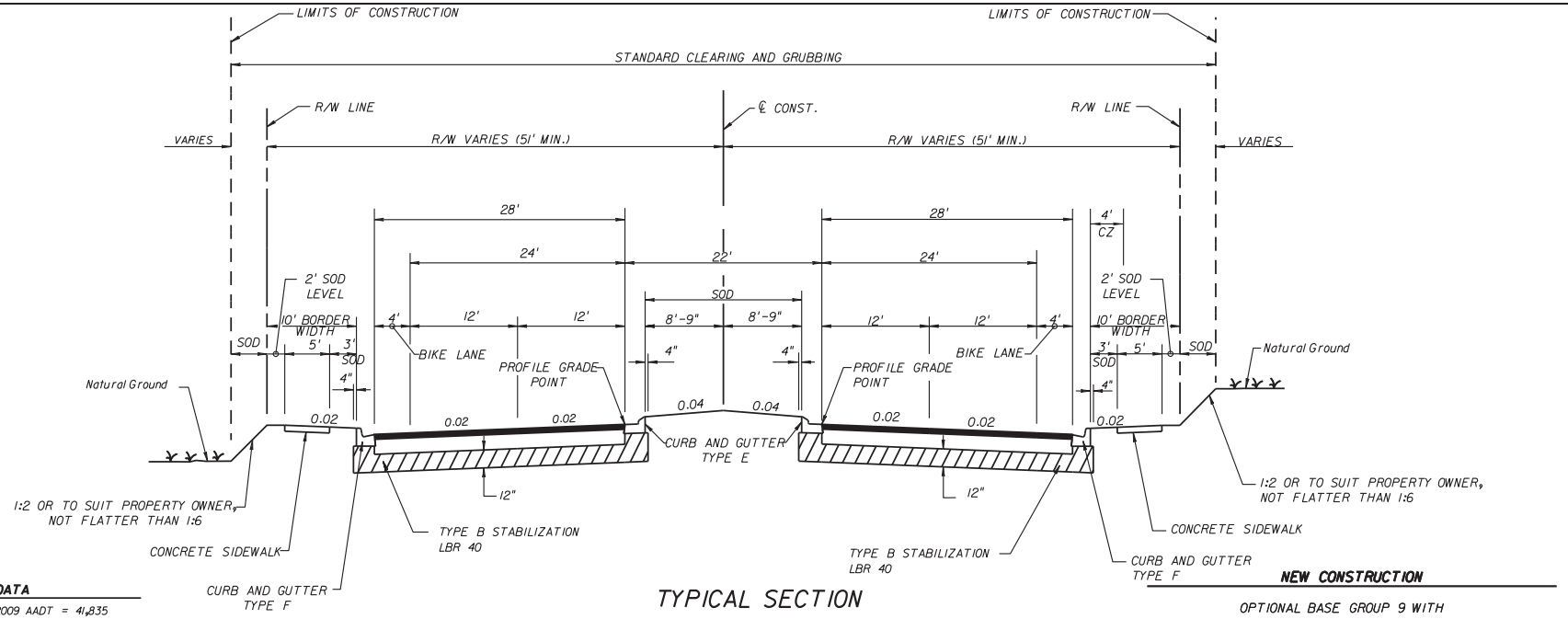
LIST OTHER INFORMATION PERTINENT TO DESIGN OF PROJECT:

N/A

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID: N/A
FEDERAL AID PROJECT NO.: N/A
COUNTY NAME: LAKE
SECTION NO.: 1147000
ROAD DESIGNATION: S.R. 91 (FLORIDA'S TURNPIKE)
LIMITS/MILEPOST: 279.40
PROJECT DESCRIPTION: HILLS OF MINNEOLA INTERCHANGE MP 279.40

PROPOSED ROADWAY TYPICAL SECTION



TRAFFIC DATA

CURRENT YEAR = 2009 AADT = 41,835
ESTIMATED OPENING YEAR = 2015 AADT = 83,400
ESTIMATED DESIGN YEAR = 2035 AADT = 124,800
K = 10.28% D = 52.81% T = 14.47% (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 45 MPH

TYPICAL SECTION
HANCOCK ROAD EXTENSION
STA. 1022+00 TO STA. 1043+00

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (2")
AND FRICTION COURSE FC-12.5 (TRAFFIC C) (1½") (RUBBER)

APPROVED BY: MARK F. BERTONCINI	COUNTY CONCURRENCE	
Engineer Of Record Signature and Date	FREDERICK SCHNEIDER, P.E. County Engineer Date	

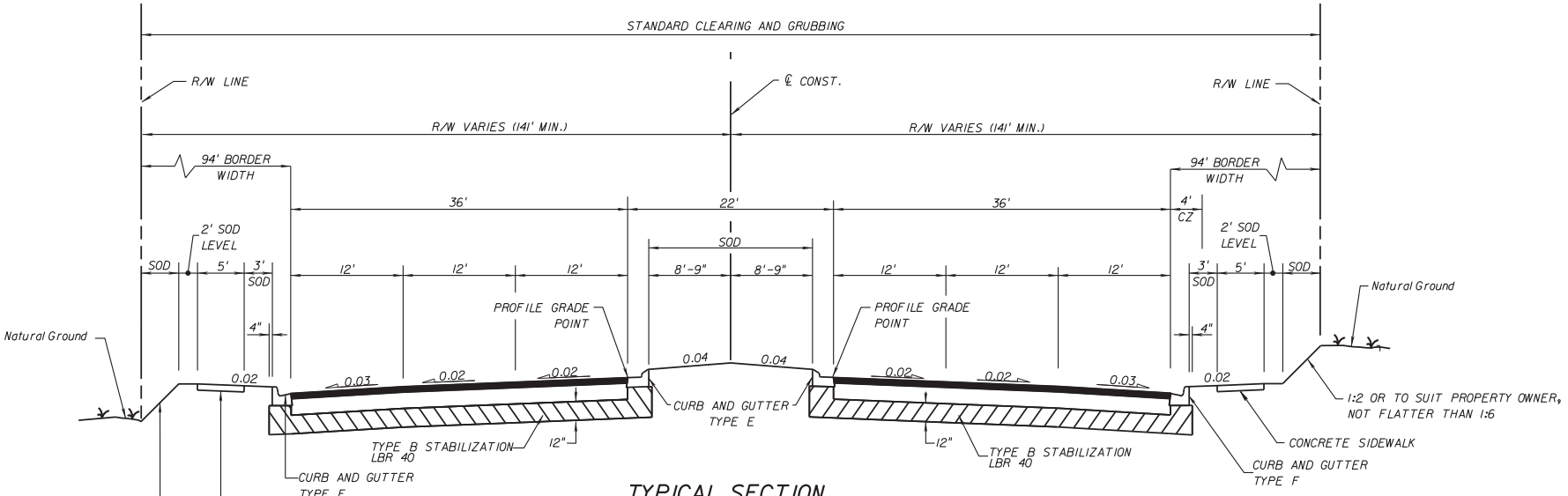
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID: N/A | FEDERAL AID PROJECT NO.: N/A | COUNTY NAME: LAKE

SECTION NO.: 1147000 | ROAD DESIGNATION: S.R. 91 (FLORIDA'S TURNPIKE) | LIMITS/MILEPOST: 279.40

PROJECT DESCRIPTION: HILLS OF MINNEOLA INTERCHANGE MP 279.40

PROPOSED ROADWAY TYPICAL SECTION



TYPICAL SECTION
HANCOCK ROAD EXTENSION
STA. 1043+00 TO STA. 1063+83
STA. 1066+65 TO STA. 1087+00

TRAFFIC DATA

CURRENT YEAR = 2009 AADT = 41,835
ESTIMATED OPENING YEAR = 2015 AADT = 83,400
ESTIMATED DESIGN YEAR = 2035 AADT = 124,800
K = 10.28% D = 52.81% T = 14.47% (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 45 MPH

NEW CONSTRUCTION

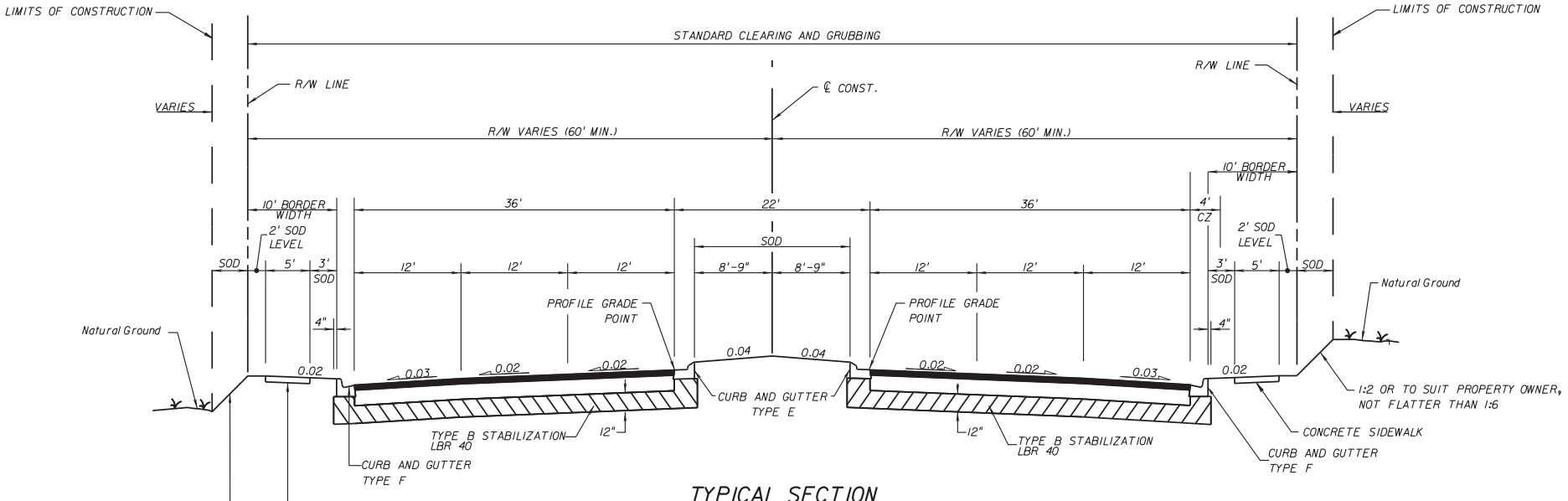
OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (2")
AND FRICTION COURSE FC-12.5 (TRAFFIC C) (1 1/2") (RUBBER)

APPROVED BY: MARK F. BERTONCINI	FDOT CONCURRENCE	FHWA CONCURRENCE
Engineer Of Record Signature and Date	LOUIS G. REIS, P.E. TURNPIKE Design Engineer Date	Printed Name FHWA Transportation Engineer Date

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID: N/A
FEDERAL AID PROJECT NO.: N/A
COUNTY NAME: LAKE
SECTION NO.: 11147000
ROAD DESIGNATION: S.R. 91 (FLORIDA'S TURNPIKE)
LIMITS/MILEPOST: 279.40
PROJECT DESCRIPTION: HILLS OF MINNEOLA INTERCHANGE MP 279.40

PROPOSED ROADWAY TYPICAL SECTION



TYPICAL SECTION
HANCOCK ROAD EXTENSION
STA. 1087+00 TO STA. 1095+00

TRAFFIC DATA

CURRENT YEAR = 2009 AADT = 41,835
ESTIMATED OPENING YEAR = 2015 AADT = 83,400
ESTIMATED DESIGN YEAR = 2035 AADT = 124,800
K = 10.28% D = 52.81% T = 14.47% (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 45 MPH

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (2")
AND FRICTION COURSE FC-12.5 (TRAFFIC C) (1½") (RUBBER)

APPROVED BY: MARK F. BERTONCINI	FDOT CONCURRENCE	FHWA CONCURRENCE
Engineer Of Record Signature and Date	FREDERICK SCHNEIDER, P.E. County Engineer — Date	Printed Name FHWA Transportation Engineer — Date

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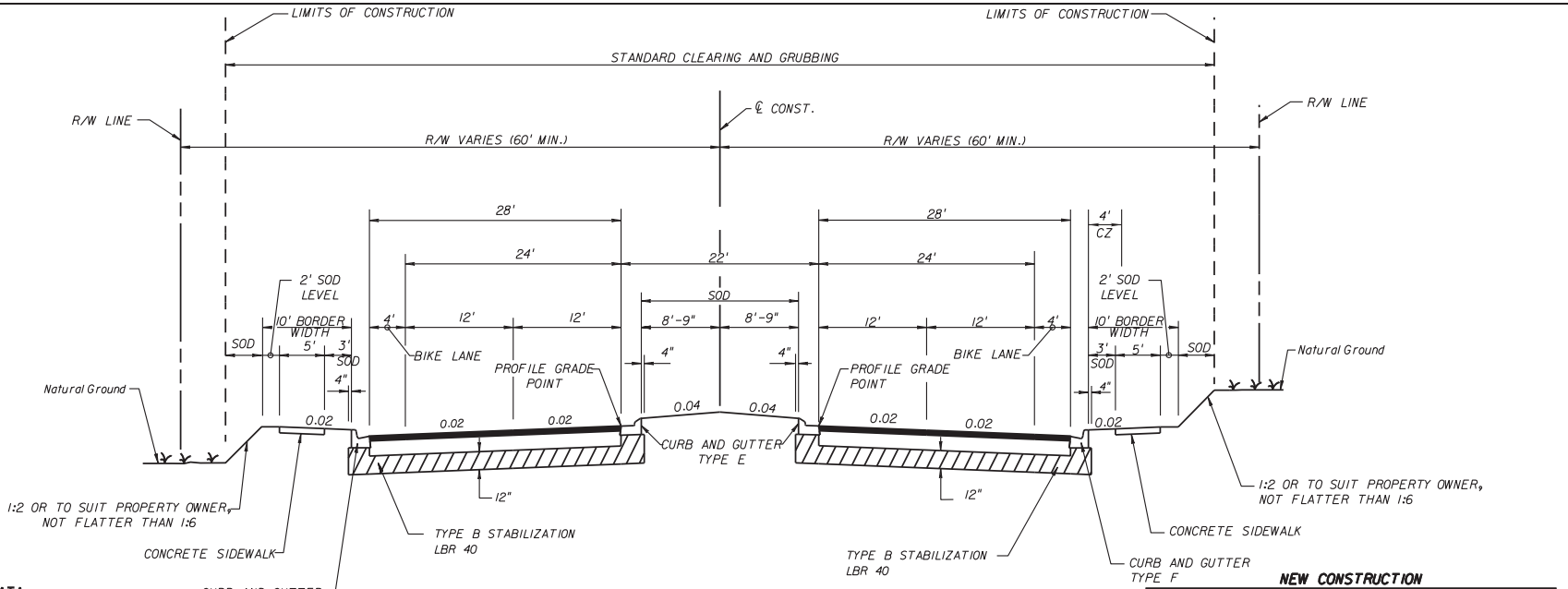
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID: N/A
FEDERAL AID PROJECT NO.: N/A
COUNTY NAME: LAKE
SECTION NO.: 11147000
ROAD DESIGNATION: S.R. 91 (FLORIDA'S TURNPIKE)
LIMITS/MILEPOST: 279.40
PROJECT DESCRIPTION: HILLS OF MINNEOLA INTERCHANGE MP 279.40

PROPOSED ROADWAY TYPICAL SECTION



TRAFFIC DATA

CURRENT YEAR = 2009 AADT = 41,835
ESTIMATED OPENING YEAR = 2015 AADT = 83,400
ESTIMATED DESIGN YEAR = 2035 AADT = 124,800
K = 10.28% D = 52.81% T = 14.47% (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 45 MPH

TYPICAL SECTION
HANCOCK ROAD EXTENSION
STA. 1097+00 TO CR 561A

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (2")
AND FRICTION COURSE FC-12.5 (TRAFFIC C) (1 1/2") (RUBBER)

APPROVED BY: MARK F. BERTONCINI	COUNTY CONCURRENCE	
Engineer Of Record Signature and Date	FREDERICK SCHNEIDER, P.E. County Engineer — Date	

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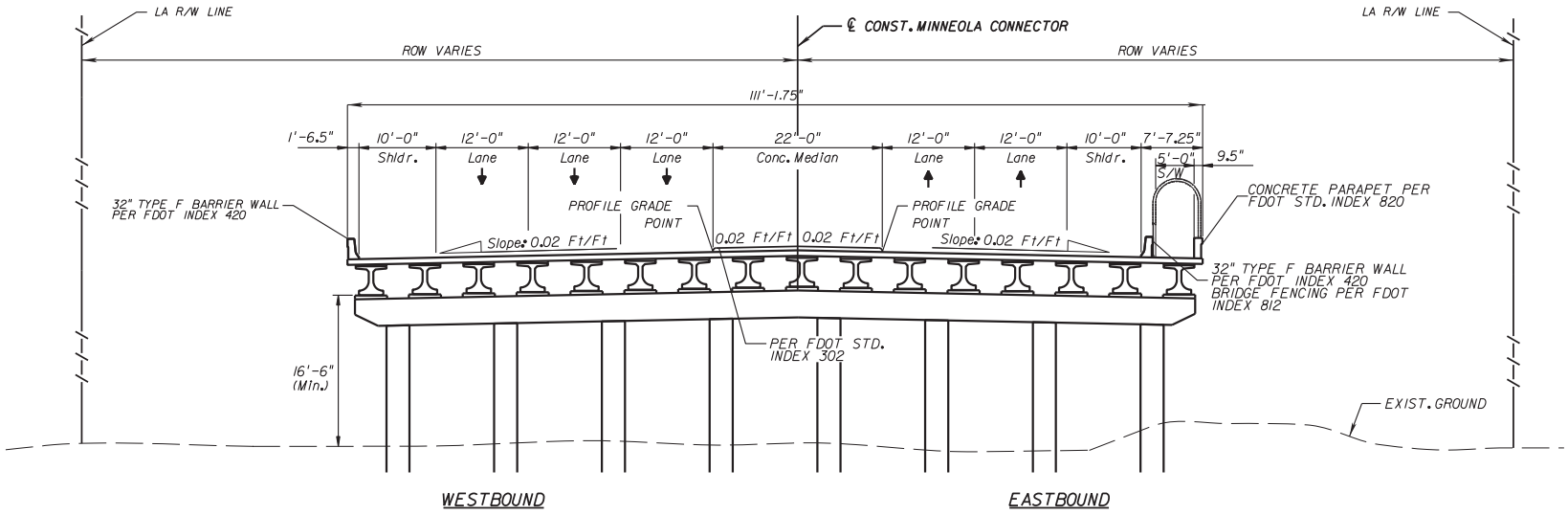
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID: N/A
FEDERAL AID PROJECT NO.: N/A
COUNTY NAME: LAKE
SECTION NO.: 1147000
ROAD DESIGNATION: S.R. 91 (FLORIDA'S TURNPIKE)
LIMITS/MILEPOST: 279.40
PROJECT DESCRIPTION: HILLS OF MINNEOLA INTERCHANGE MP 279.40

PROPOSED STRUCTURAL TYPICAL SECTION



TYPICAL SECTION
HANCOCK ROAD EXTENSION BRIDGE OVER TURNPIKE
(DS=45 MPH)
STA. 1063+83 TO STA. 1066+65

TRAFFIC DATA

CURRENT YEAR = 2009 AADT = 41,835
ESTIMATED OPENING YEAR = 2015 AADT = 83,400
ESTIMATED DESIGN YEAR = 2035 AADT = 124,800
K = 10.28% D = 52.81% T = 14.47% (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 45 MPH

APPROVED BY: MARK F. BERTONCINI	FDOT CONCURRENCE	FHWA CONCURRENCE
Engineer Of Record Signature and Date	LOUIS G. REIS, P.E. TURNPIKE Design Engineer Date	Printed Name FHWA Transportation Engineer Date

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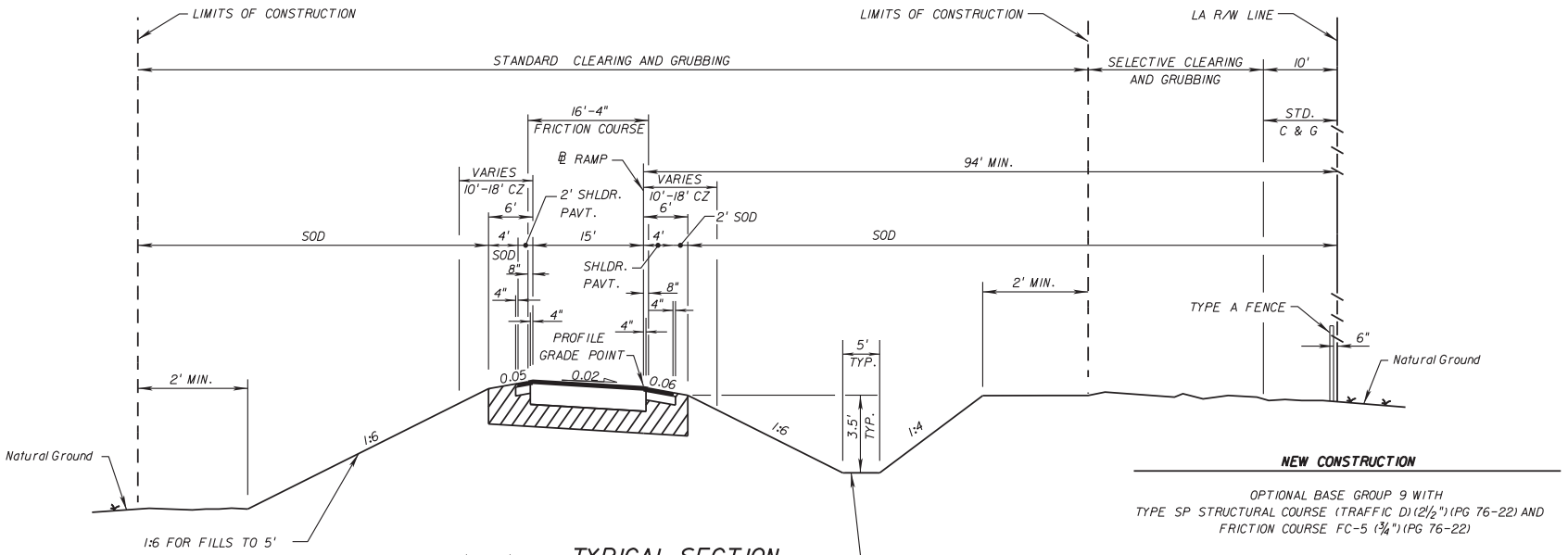
PROJECT IDENTIFICATION

FINANCIAL PROJECT ID: N/A
FEDERAL AID PROJECT NO.: N/A
COUNTY NAME: LAKE
SECTION NO.: 1147000
ROAD DESIGNATION:
LIMITS/MILEPOST: 279.40
PROJECT DESCRIPTION: HILLS OF MINNEOLA INTERCHANGE MP 279.40

PROPOSED ROADWAY TYPICAL SECTION



TYPICAL SECTION
RAMPS A, C, D, & E

TRAFFIC DATA

CURRENT YEAR = 2009 AADT = 41,835
ESTIMATED OPENING YEAR = 2015 AADT = 83,400
ESTIMATED DESIGN YEAR = 2035 AADT = 124,800
K = 10.28% D = 52.81% T = 14.47% (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 35-55 MPH

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (2½") (PG 76-22) AND
FRICTION COURSE FC-5 (¾") (PG 76-22)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (2½") (PG 76-22) AND
FRICTION COURSE FC-5 (¾") (PG 76-22)

APPROVED BY: MARK F. BERTONCINI	FDOT CONCURRENCE	FHWA CONCURRENCE
Engineer Of Record Signature and Date	LOUIS G. REIS, P.E. TURNPIKE Design Engineer Date	Printed Name FHWA Transportation Engineer Date

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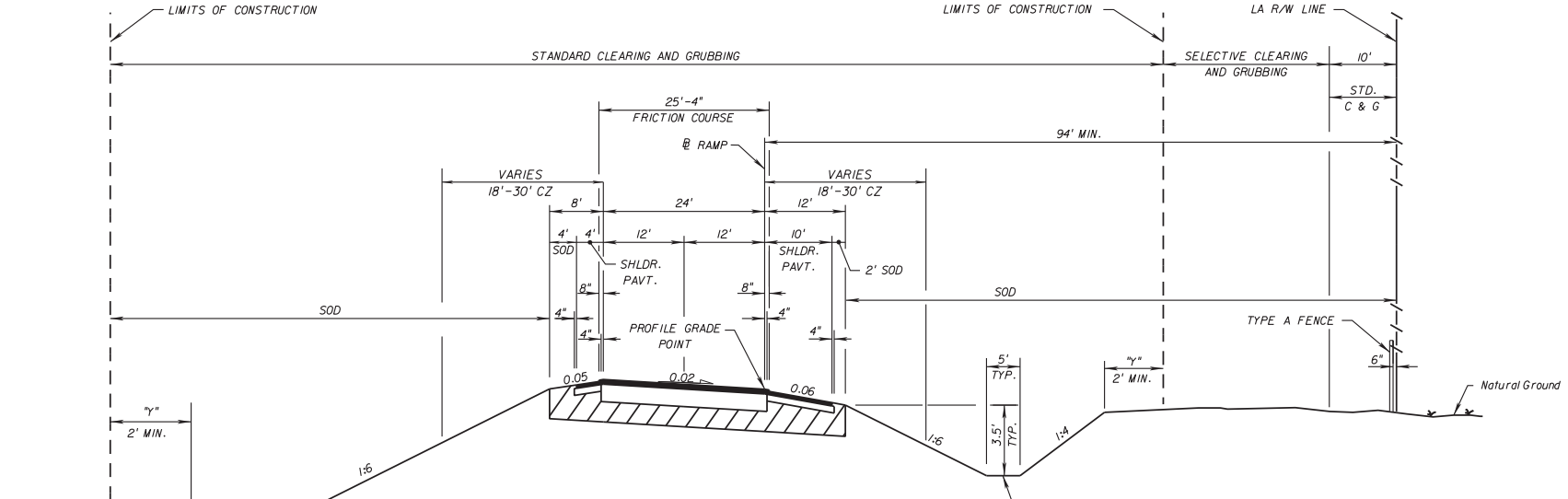
COUNTY NAME: LAKE
SECTION NO.: 11147000
ROAD DESIGNATION: S.R. 91 (FLORIDA'S TURNPIKE)
LIMITS/MILEPOST: 279.40
PROJECT DESCRIPTION: HILLS OF MINNEOLA INTERCHANGE MP 279.40

PROPOSED ROADWAY TYPICAL SECTION



TYPICAL SECTION
RAMP B

TRAFFIC DATA

CURRENT YEAR = 2009 AADT = 41,835
ESTIMATED OPENING YEAR = 2015 AADT = 83,400
ESTIMATED DESIGN YEAR = 2035 AADT = 124,800
K = 10.28% D = 52.81% T = 14.47% (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 35-55 MPH

1:6 FOR FILLS TO 5'
1:6 TO EDGE OF CLEAR ZONE & 1:4 FOR FILLS 5' TO 10'
1:6 TO EDGE OF CLEAR ZONE & 1:3 FOR FILLS 10' TO 20'
1:2 (WITH GUARDRAIL) FILLS OVER 20'

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (2") (PG 76-22) AND
FRICTION COURSE FC-5 (¾") (PG 76-22)

LEFT SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (2") (PG 76-22) AND
FRICTION COURSE FC-5 (¾") (PG 76-22)

RIGHT SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC B) (2") AND
FRICTION COURSE FC-5 (¾") (PG 76-22)

APPROVED BY: MARK F. BERTONCINI	FDOT CONCURRENCE	FHWA CONCURRENCE
Engineer Of Record Signature and Date	LOUIS G. REIS, P.E. TURNPIKE Design Engineer Date	Printed Name FHWA Transportation Engineer Date

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PROJECT IDENTIFICATION

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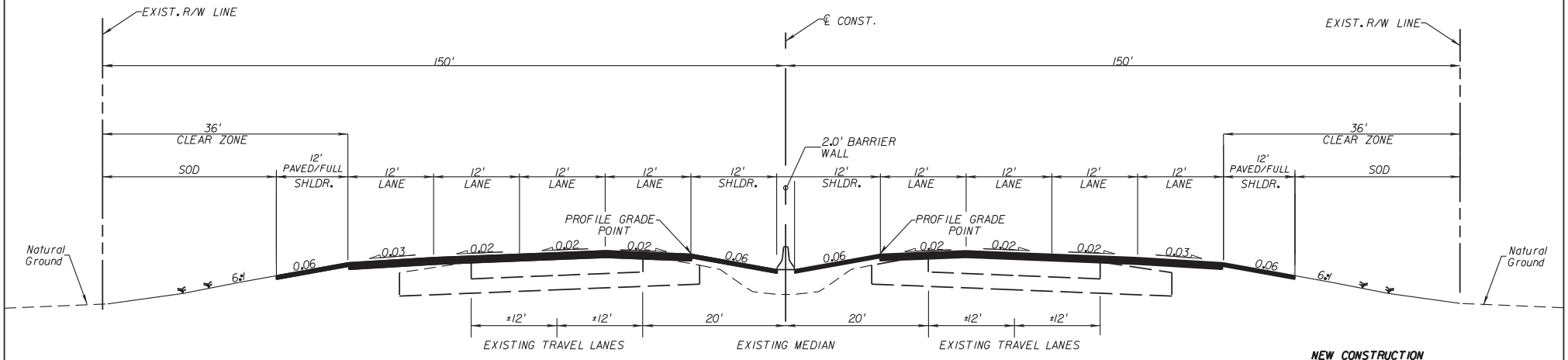
COUNTY NAME: LAKE
SECTION NO.: 1147000
ROAD DESIGNATION: S.R. 91 (FLORIDA'S TURNPIKE)
LIMITS/MILEPOST: 279.40
PROJECT DESCRIPTION: HILLS OF MINNEOLA INTERCHANGE MP 279.40

PROPOSED ROADWAY TYPICAL SECTION



TRAFFIC DATA

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ESTIMATED OPENING YEAR = 2015 AADT = 83,400
ESTIMATED DESIGN YEAR = 2035 AADT = 124,800
K = 10.28% D = 52.81% T = 14.47% (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 70 MPH

TYPICAL SECTION
TURNPIKE
STA. 15215+00 TO STA. 15235+00
STA. 15265+00 TO STA. 15300+00
(FUTURE 8 LANE SECTION)

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (2")
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1½") (PG 76-22)
AND FRICTION COURSE FC-5 (¾") (PG 76-22)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1½") (PG 76-22)
AND FRICTION COURSE FC-5 (¾") (PG 76-22)

APPROVED BY: MARK F. BERTONCINI	FDOT CONCURRENCE	FHWA CONCURRENCE
Engineer Of Record Signature and Date	LOUIS G. REIS, P.E. TURNPIKE Design Engineer Date	Printed Name FHWA Transportation Engineer Date

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PROJECT IDENTIFICATION

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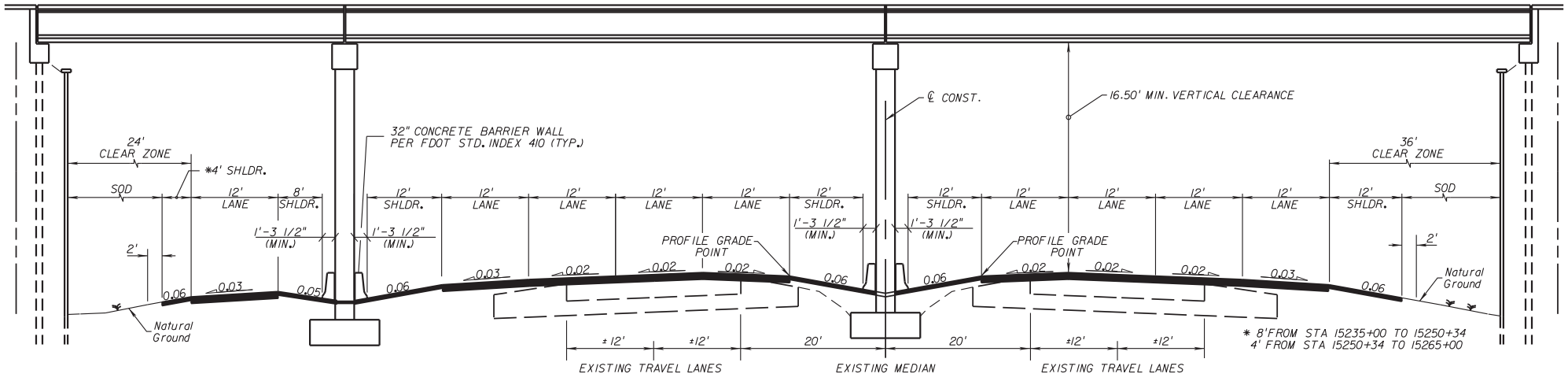
COUNTY NAME: LAKE
SECTION NO.: 1147000
ROAD DESIGNATION: S.R. 91 (FLORIDA'S TURNPIKE)
LIMITS/MILEPOST: 279.40
PROJECT DESCRIPTION: HILLS OF MINNEOLA INTERCHANGE MP 279.40

PROPOSED ROADWAY TYPICAL SECTION



TYPICAL SECTION
TURNPIKE
(UNDER BRIDGE)
STA. 15262+00

TRAFFIC DATA

CURRENT YEAR = 2009 AADT = 41,835
ESTIMATED OPENING YEAR = 2015 AADT = 83,400
ESTIMATED DESIGN YEAR = 2035 AADT = 124,800
K = 10.28% D = 52.81% T = 14.47% (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 70 MPH

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (2")
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1½") (PG 76-22)
AND FRICTION COURSE FC-5 (¾") (PG 76-22)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1½") (PG 76-22)
AND FRICTION COURSE FC-5 (¾") (PG 76-22)

APPROVED BY: MARK F. BERTONCINI	FDOT CONCURRENCE	FHWA CONCURRENCE
Engineer Of Record Signature and Date	LOUIS G. REIS, P.E. TURNPIKE Design Engineer Date	Printed Name FHWA Transportation Engineer Date

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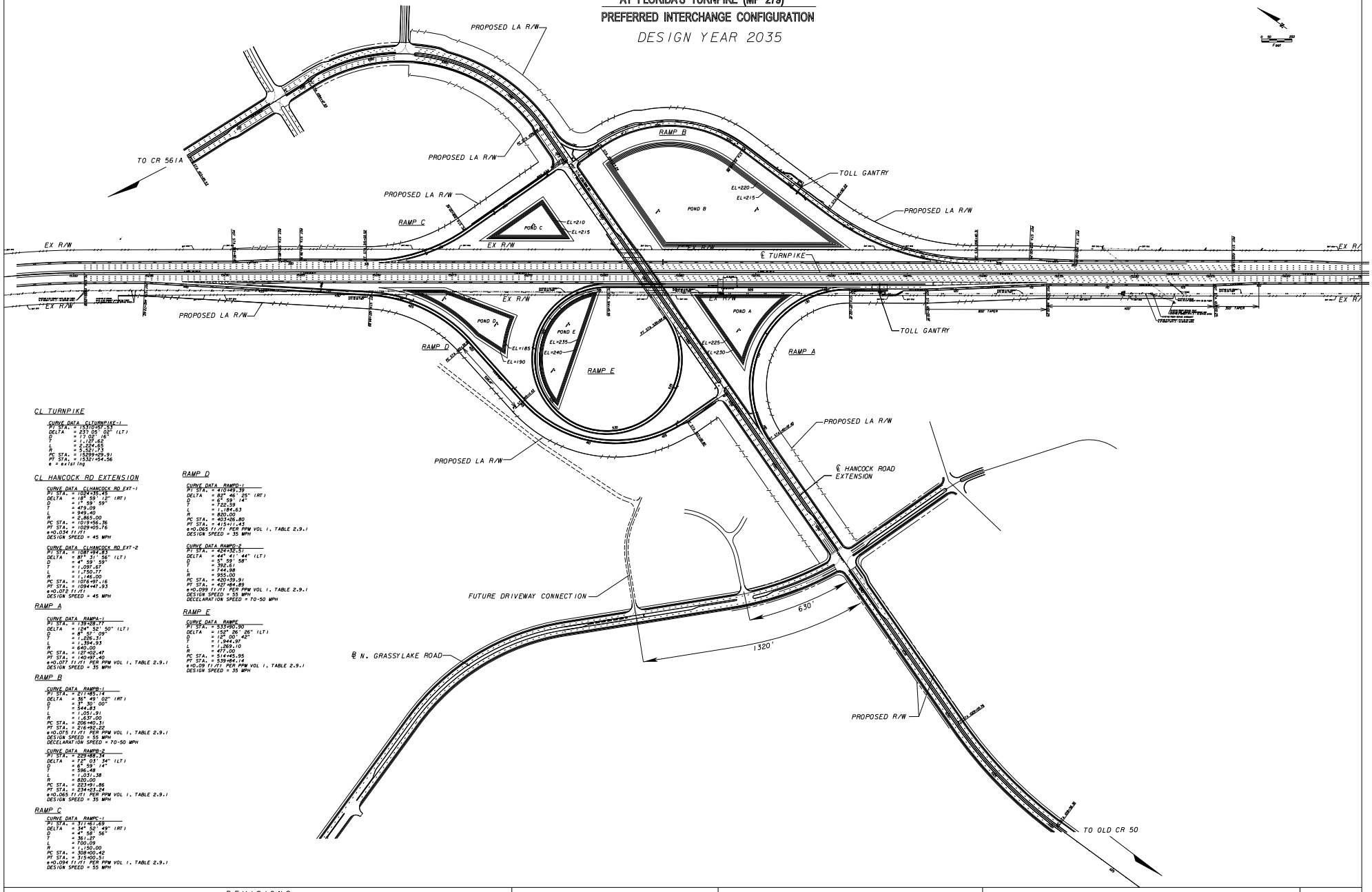
MINNEOLA INTERCHANGE AT FLORIDA'S TURNPIKE (MP 279)

PREFERRED INTERCHANGE CONFIGURATION

DESIGN YEAR 2035



CL TURNPIKE

CURVE DATA CLTURNPIKE-1
PI STA. = 1531+09.55
DELTA = 23° 05' 03" (LT)
D = 1° 27.6"
T = 1,127.66
L = 2,254.55
R = 5,521.73
PC STA. = 1528+99.91
PT STA. = 1532+54.56
e = existing

CL HANCOCK RD EXTENSION

CURVE DATA CLHANCOCK RD EXT-1
PT STA. = 1024+35.45
DELTA = 19° 59' 12" (RT)
D = 1° 59' 59"
T = 479.09
L = 949.40
R = 2,865.00
PC STA. = 1019+56.36
PT STA. = 1029+05.76
e =0.054 ft/ft
DESIGN SPEED = 45 MPH

CURVE DATA CLHANCOCK RD EXT-2
PT STA. = 1089+97.83
DELTA = 87° 31' 56" (LT)
D = 4° 39'
T = 1,097.67
L = 1,750.17
R = 1,146.00
PC STA. = 1076+97.16
PT STA. = 1094+47.33
e =0.072 ft/ft
DESIGN SPEED = 45 MPH

RAMP A

CURVE DATA RAMPA-1
PT STA. = 139+28.17
DELTA = 124° 52' 50" (LT)
D = 8° 57' 09"
T = 1,226.31
L = 1,394.93
R = 640.00
PC STA. = 127+02.47
PT STA. = 140+97.40
e =0.077 ft/ft PER PPM VOL 1, TABLE 2.9.1
DESIGN SPEED = 35 MPH

RAMP B

CURVE DATA RAMPB-1
PT STA. = 211+85.14
DELTA = 36° 49' 02" (RT)
D = 3° 30' 00"
T = 544.83
L = 1,051.91
R = 1,637.00
PC STA. = 206+40.31
PT STA. = 216+92.22
e =0.075 ft/ft PER PPM VOL 1, TABLE 2.9.1
DESIGN SPEED = 55 MPH
DECELERATION SPEED = 70-50 MPH

CURVE DATA RAMPB-2
PT STA. = 229+88.19
DELTA = 75° 03' 54" (LT)
D = 6° 59' 14"
T = 596.48
L = 1,031.38
R = 820.00
PC STA. = 223+91.86
PT STA. = 234+23.24
e =0.065 ft/ft PER PPM VOL 1, TABLE 2.9.1
DESIGN SPEED = 35 MPH

RAMP C

CURVE DATA RAMPC-1
PT STA. = 371+61.69
DELTA = 34° 58' 49" (RT)
D = 4° 58' 56"
T = 361.57
L = 700.09
R = 1,150.00
PC STA. = 308+00.42
PT STA. = 315+00.51
e =0.094 ft/ft PER PPM VOL 1, TABLE 2.9.1
DESIGN SPEED = 55 MPH

RAMP D

CURVE DATA RAMPD-1
PT STA. = 410+49.59
DELTA = 82° 46' 25" (RT)
D = 6° 59' 14"
T = 722.59
L = 1,184.63
R = 820.00
PC STA. = 403+26.80
PT STA. = 415+11.43
e =0.065 ft/ft PER PPM VOL 1, TABLE 2.9.1
DESIGN SPEED = 35 MPH

CURVE DATA RAMPD-2
PT STA. = 424+38.57
DELTA = 44° 41' 44" (LT)
D = 6° 59' 58"
T = 392.61
L = 744.38
R = 955.00
PC STA. = 420+39.91
PT STA. = 427+84.89
e =0.099 ft/ft PER PPM VOL 1, TABLE 2.9.1
DESIGN SPEED = 55 MPH
DECELERATION SPEED = 70-50 MPH

RAMP E

CURVE DATA RAMPE
PT STA. = 533+90.30
DELTA = 152° 06' 26" (LT)
D = 12° 00' 42"
T = 1,944.97
L = 1,269.10
R = 477.00
PC STA. = 514+45.95
PT STA. = 539+84.14
e =0.09 ft/ft PER PPM VOL 1, TABLE 2.9.1
DESIGN SPEED = 35 MPH

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

VHB
Vanasse Hangen Brustlin, Inc.
Transportation, Land Development, Environmental Services
225 E. Robinson St., Suite 300
Landmark Center Two
Orlando, FL 32801 (407)839-4006
Certificate of Authorization # 3932

Mark F. Bertoncini, P.E.
PE # 63437

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

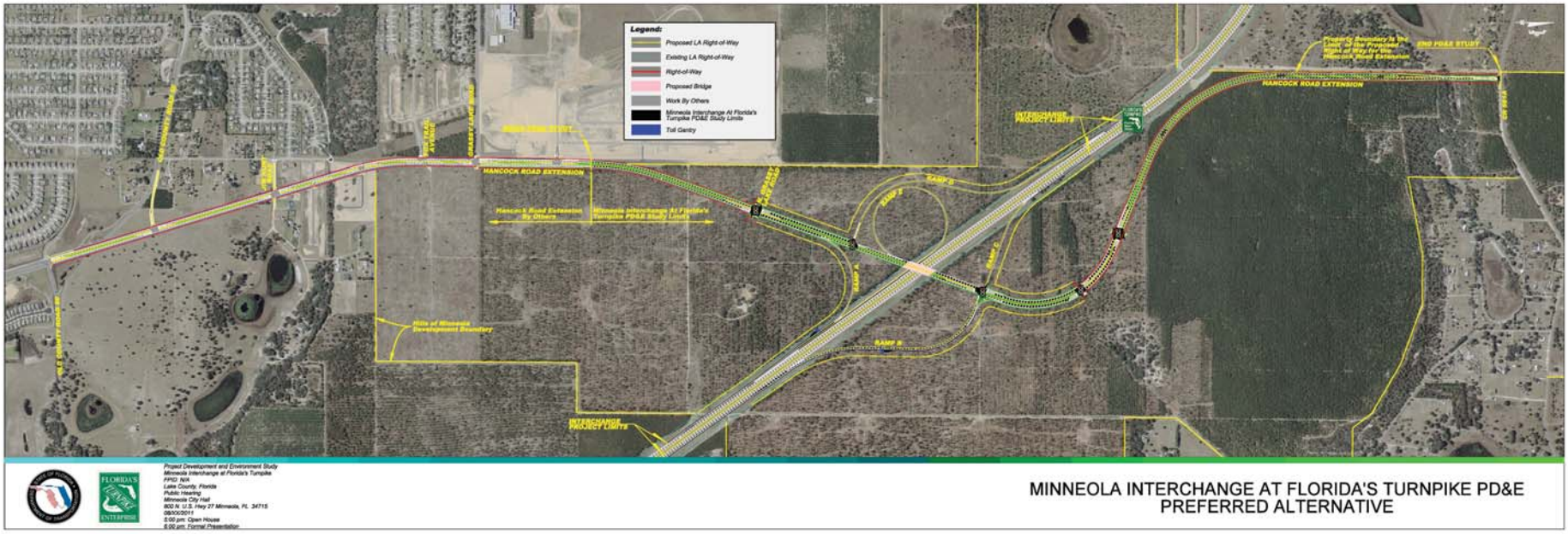
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
		- - -

MINNEOLA INTERCHANGE PREFERRED INTERCHANGE CONFIGURATION

SHEET NO.

RVerdel 8/25/2011 5:19:02 PM P:\611140.00\cad\e\611140.00\roadway\DSGNRD01_Flip.dgn

APPENDIX C



MINNEOLA INTERCHANGE AT FLORIDA'S TURNPIKE PD&E
PREFERRED ALTERNATIVE