

### 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

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**

Location	Opening Yr, 2014/15		Design Yr, 2035	
	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 FACILITIES**

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