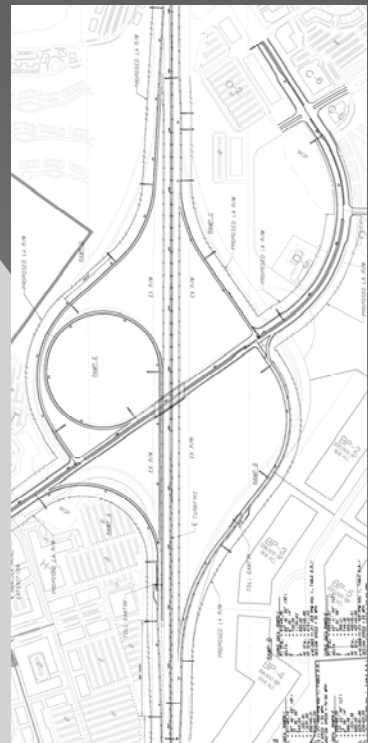




Preliminary Planning Study

New Interchange at Hills of Minneola Lake County MP 279



FINAL
August 2009

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Executive Summary

Florida's Turnpike Enterprise (the Turnpike) has completed a preliminary planning study for a proposed new interchange at approximate Turnpike milepost (MP) 279 in Lake County. The new interchange is proposed by the owner of a planned mixed-use development which the interchange would serve. Studies have shown the interchange would also be a valuable new regional Turnpike access point for other travel not related to the proposed development.

The first full year of operation of the interchange was assumed in the study to be fiscal year (FY) 2015. The study has evaluated the anticipated traffic levels the interchange is expected to serve and the revenues that may be generated by that traffic. The study has also estimated the costs to develop the interchange and other improvements that will be required if a new interchange is introduced at this location.

The delivery of the interchange project and associated improvements will be through a public-private partnership arrangement between the Turnpike and the developer. This preliminary planning study, the cost estimates, and the traffic and revenue forecasts have been produced to help develop the public-private partnering agreement.

For the traffic forecasts, this study utilized a travel demand model called the Turnpike Central Florida Model (TCFM), developed specifically for toll road traffic forecasts in the 10-county Central Florida region. This model incorporates a number of features which make it preferable to the traditional four-step model for estimating toll traffic. In this study, traffic forecasts from the TCFM were used to estimate potential toll revenues with and without the interchange, the difference being attributable to the project.

This report includes a brief description of the project and estimated project costs, followed by a summary of the travel demand model, the study methods, and the findings from the traffic and revenue forecasts.

1.0 Project Location and Background

Figure 1.1 illustrates the proposed interchange location at approximate Turnpike MP 279. The crossing street at the interchange would be a new roadway which would be an extension of Hancock Road. At present, there is no crossing road at the proposed interchange location. The interchange and connecting roadways, including the extension of Hancock Road, would be developed concurrently with the approved Development of Regional Impact (DRI) mixed-use project known as Hills of Minneola, which is also depicted on the map in **Figure 1.1**. The DRI would occupy approximately 1,830 acres adjacent to the Turnpike. The interchange would be the DRI's primary access to the regional surface transportation network. The extension of Hancock Road would be a main arterial street within the DRI.

The Hills of Minneola DRI development plan includes approximately 1.5 million square feet of office and commercial development, more than 3,900 housing units, and approximately 1.4 million square feet of industrial land use. It is proposed to begin development during 2012 and to be "built-out" in phases. The DRI applicant is Family Dynamics Land Company, LLC. The DRI approving agency is the City of Minneola, which has annexed the entire Hills of Minneola DRI area. In April 2008, representatives of SouthStar Development Partners indicated to the Turnpike their intent to purchase and develop the DRI property and their interest in the application for the proposed new interchange.

The Development Order (DO) agreement for the DRI was issued during early 2007. Traffic mitigation requirements identified in the DO make it likely that the proposed interchange will be needed before the development may proceed beyond the initial phase. The applicant has indicated their intention to begin construction of the interchange near the on-set of their development, with an opening-to-traffic during 2014. For the purpose of forecasting traffic and revenue in this study, it was assumed the first full year of operation of the interchange will be FY 2015.

In the area of the interchange, the future extension of Hancock Road will be a basic six-lane, divided arterial street. It will overpass the Turnpike on bridge structure. As of this writing, the interchange is under design by the developer. **Figure 1.2** is a concept drawing of the proposed interchange, based on the on-going design work. The interchange is proposed as a modified diamond type (or partial cloverleaf), with diagonal ramps in all four interchange quadrants and a directional loop ramp in the same quadrant as the off-ramp from the Turnpike southbound. Signalized traffic control would be located at the intersections of Hancock Road and the interchange diagonal ramp terminals.

Figure 1.1
Location Map

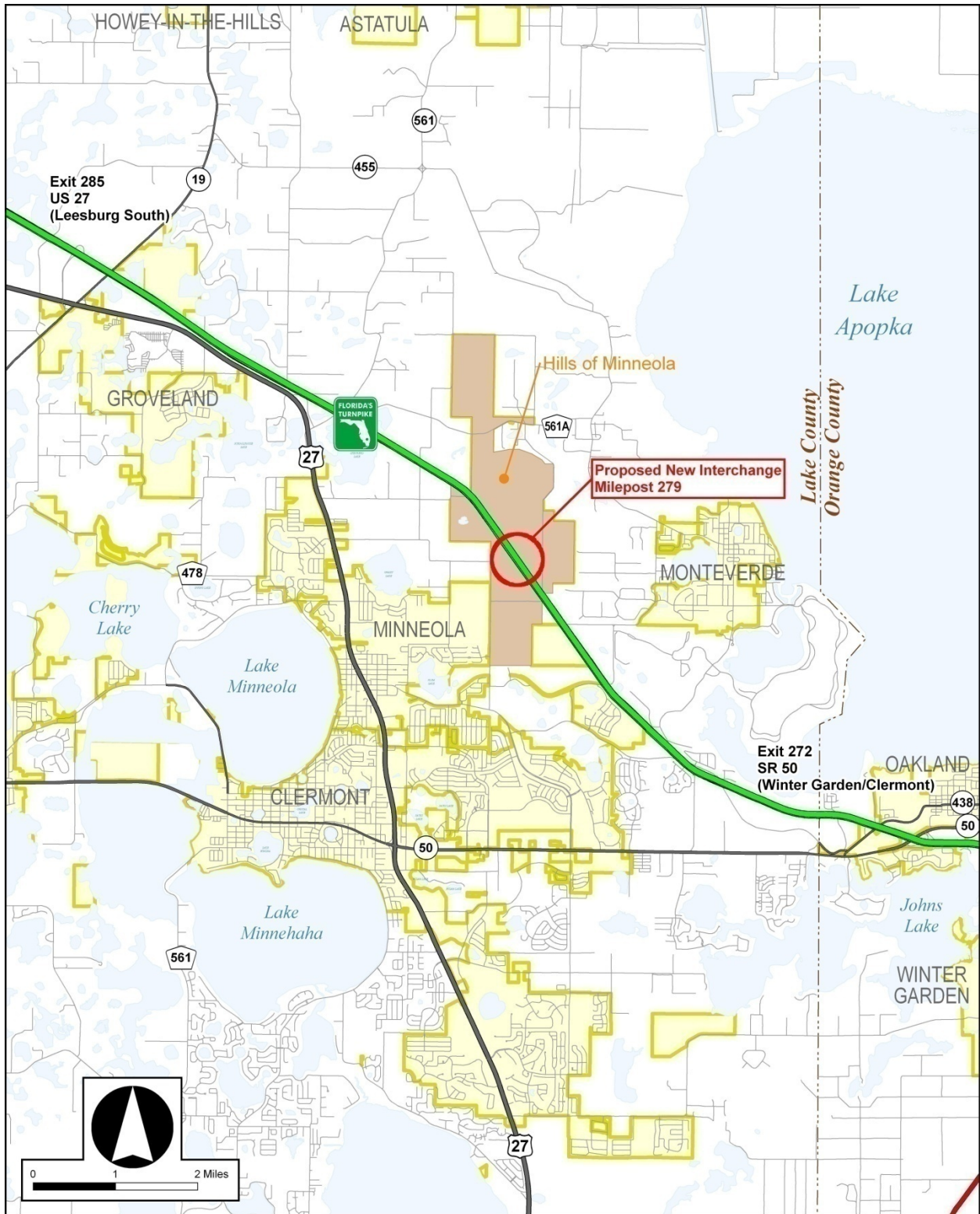
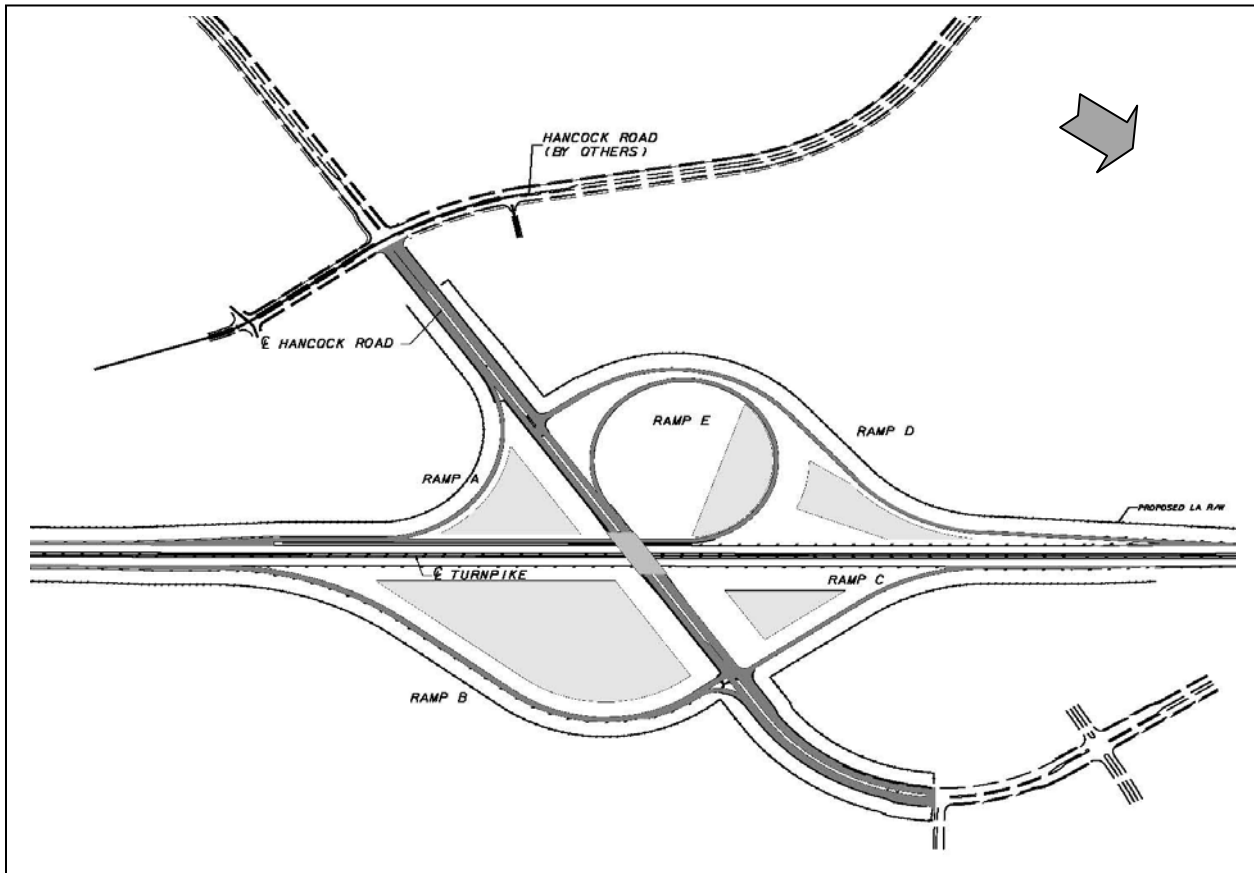


Figure 1.2
Proposed Interchange Concept



Source: Vanasse Hangen Brustlin, Inc., consultants to Hills of Minneola DRI Developer

Tolls will be collected only to/from the south. Toll collection at the proposed new interchange will be all-electronic, using Florida's SunPass pre-paid toll service or a video tolling option. There will be no toll booths or plazas; no stopping of vehicles to collect tolls. Electronic toll collection (ETC) reader equipment and cameras will be mounted on overhead structures at the interchange ramps to/from the south. As vehicles pass at normal speed, SunPass customers' accounts will be automatically debited for the toll charges. For vehicles not equipped with SunPass, a "video tolling" option will be available. For customers using video tolling, their license tag will be photographed and toll charges will be debited from a pre-paid account tied to the license tag. If video tolling customers have no pre-paid account, they will be billed by mail. Proposed toll rates and charges for traffic at the interchange are discussed in subsection "3.4 Toll Rates."

Preliminary Planning Study – Hills of Minneola Interchange

Traffic studies have determined that, with the interchange, additional travel lanes will be needed on the Turnpike between the new interchange and the next interchange to the south (S.R. 50/Clermont interchange at MP 272). The studies show the additional traffic from the interchange will require widening the Turnpike from the present 4-lanes to 8-lanes by FY 2022 in order to maintain an acceptable service level. (Even without the interchange, the studies show, 6-laning will be warranted along this Turnpike section in the near future.)

2.0 Project Cost Estimates

Estimates of project costs for the interchange and associated improvements were developed during June 2009. The results are summarized in **Table 2.1**. The construction cost estimates for the interchange and Turnpike widening were prepared using the Florida Department of Transportation’s Long Range Estimating (LRE) System. It is anticipated that the Turnpike widening can be accomplished within existing right-of-way; however, some new right-of-way will be required for ponds to handle added storm water runoff. Those right-of-way costs were estimated by Turnpike Right-of-Way Department staff, based on anticipated pond requirements. Design, post-design, and construction engineering and inspection (CE&I) costs were estimated using Turnpike standard percentages for those items.

Table 2.1
Project Cost Estimate
(FY 2009 Present Day Costs)

Project Phase	New Interchange	Turnpike Widening (MP 272-279)
Project Development & Environment (PD&E) Study	n/a ^{\1}	\$ 750,000 ^{\3}
Design (12% of Construction Cost Estimate)	n/a ^{\1}	10,680,000
Right-of-Way	n/a ^{\2}	17,300,000
Construction	\$ 30,500,000	89,000,000
CE&I (8% of Construction Cost Estimate)	2,440,000	7,120,000
Post-Design (2.5 % of Construction Cost Estimate)	763,000	2,225,000
TOTAL	\$ 33,703,000	\$ 127,075,000

^{\1} Assumed as sunk costs; activity is underway as of this writing, with funding by Hills of Minneola developer.

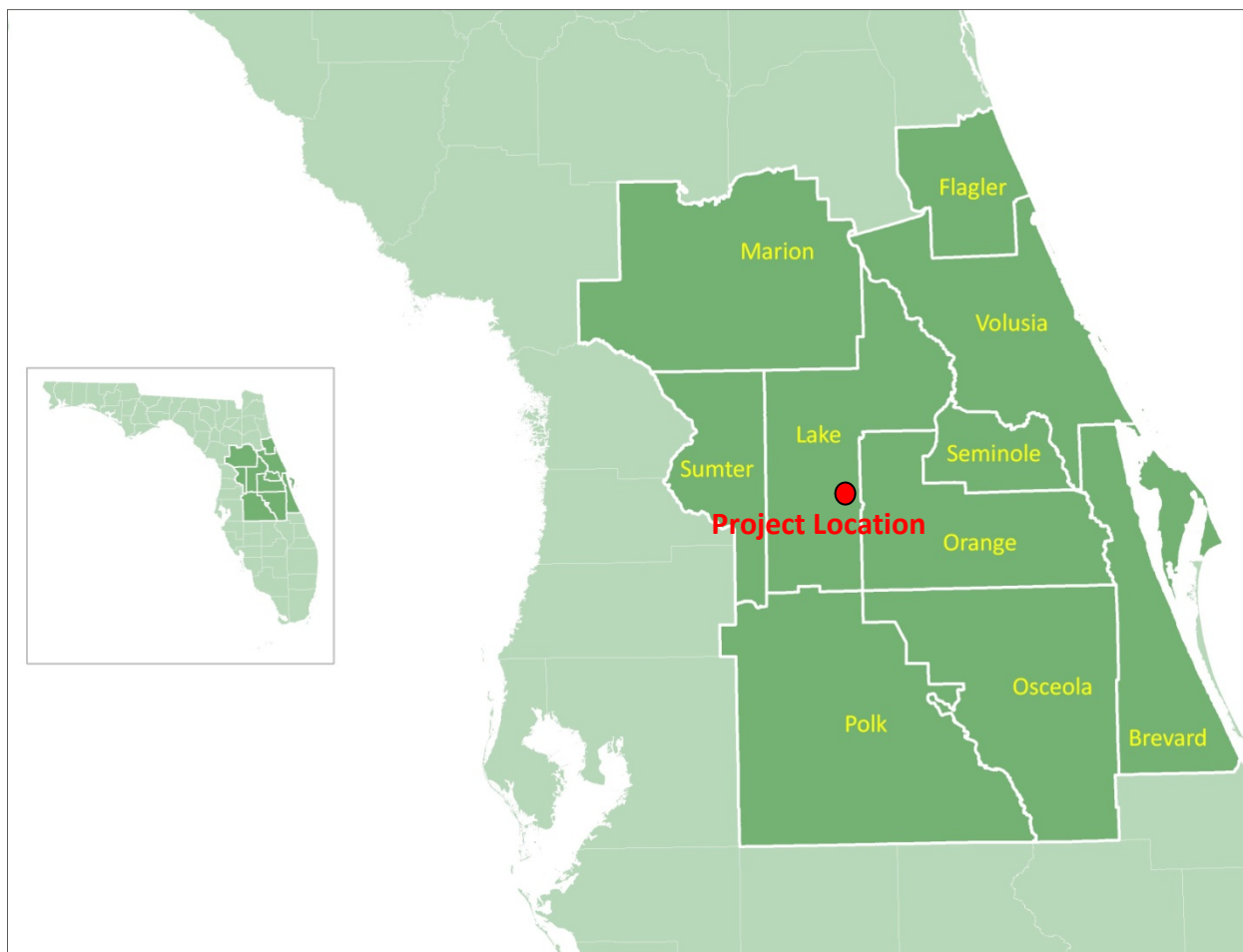
^{\2} Interchange right-of-way to be donated by Hills of Minneola development.

^{\3} Proportional share of cost for longer PD&E covering Turnpike MP 272-309.

3.0 Travel Demand Model

The Turnpike Central Florida Model (TCFM) was developed for toll road traffic forecasts in the Central Florida region, which includes Brevard, Flagler, Lake, Marion, Orange, Osceola, Polk, Seminole, Sumter, and Volusia counties (see **Figure 3.1**). The model became available for use in February 2009 and was used at that time to produce design-year traffic forecasts to support development of the engineering design for the proposed interchange at MP 279.

Figure 3.1
Turnpike Central Florida Model (TCFM) 10-County Regional Area



3.1 About the Model

The TCFM is a customized travel demand modeling tool developed specifically to forecast toll traffic. The standard Florida model used by Florida Metropolitan Planning Organizations (MPOs) is designed to simulate regional travel preferences and patterns, and works acceptably

for that purpose. However, to more precisely simulate drivers' decisions to use toll roads, a number of improvements are incorporated into the TCFM. Full documentation for this model is included with the report *"Turnpike Central Florida Model (TCFM),"* published by the Turnpike.

For estimating future toll traffic, the TCFM is an improvement over the standard forecasting tool used in Florida for the last 25 years. With the traditional modeling methods, specific toll amounts on tolled roadway network links were simply converted to travel time penalties, or impedances. The TCFM departs from the standard four-step modeling approach and incorporates new components such as matrix estimation and ramp-to-ramp tolling, and is a vehicle trip model. Among other notable features of the TCFM are:

- A GIS database model platform that allows enhanced levels of detail and precision for roadway network definition, land use (including projects such as Hills of Minneola), and socioeconomic data, as well as refinements for road network speed/capacity relationships by road type and area type classifications,
- A toll sensitivity component based on a measure of travelers' "willingness to pay" and extensive travel surveys, speed studies, traffic counts, and other empirical data collected specifically for the model study area,
- A web-based Household Travel Diary Survey that provides details about region-wide travel patterns and origins/destinations of trips (approximately 500 households participated),
- A land use allocation model which realistically distributes future growth based on current land use, transportation accessibility, available land area, and a number of other characteristics.

The TCFM is an annual average daily traffic (AADT) model. The model incorporates all improvements in the current FDOT work program into the year 2015 network development. Subsequent future year network improvements were developed by applying a capacity concurrency procedure to support the future land use estimates. To define the appropriate roadway network detail, the initial traffic analysis zone (TAZ) boundaries were determined by the base network. Any TAZs with very large trip generations were split into smaller ones in response to network loading issues.

The model also utilizes posted speed limits and the appropriate roadway capacities based on ground traffic counts and road classification. The trip generation for the productions and

attractions is vehicle-based. A gravity model was used to distribute the trips based on free-flow travel times and produced a seed table used in model calibration.

A “matrix estimation” procedure was applied to calibrate a final trip table. This procedure evaluates the ratios of assigned vehicle trips to the traffic counts on the links where counts have been performed, modifies the origin/destination trips, and reassigns the modified trip matrix until a user-specified number of passes is reached. More than 8,900 traffic counts from year 2005, covering 10 counties, were verified and used in this calibration. This quantity of counts translates to about 16 percent of all the links in the model network that have counts. To verify the accuracy of the validation, the root mean square error (RMSE) statistics were reviewed. The TCFM produced an overall error statistic of less than 10 percent on all roads.

3.2 Travel Model Socioeconomic Assumptions

The TCFM was used to produce traffic forecasts for the proposed interchange, the Turnpike Mainline, and other area roadways for five-year increments, beginning in 2015 and extending to 2035. For years between and beyond the forecast years, the data were interpolated and extrapolated, respectively.

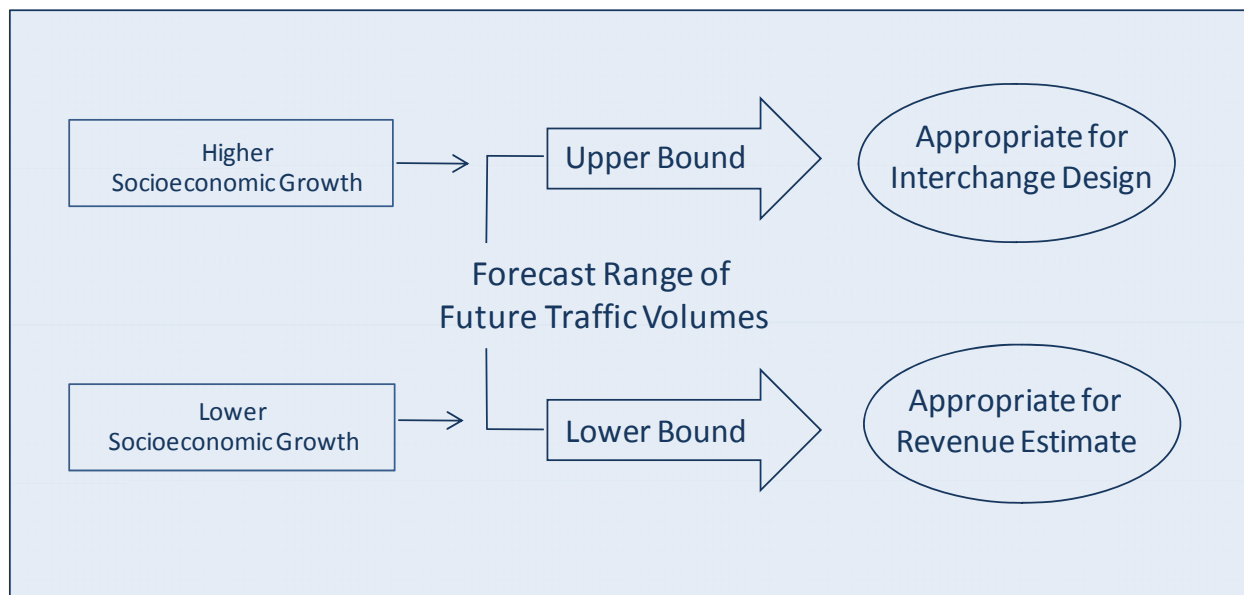
For each of the modeled years, forecasts were produced for a “Build” and a “No Build” condition. The “No Build” condition did not include the proposed interchange or the DRI development; the “Build” condition assumed the interchange would be opened-to-traffic in 2014, with the first full year of operation being FY 2015.

Among the important basic assumptions for the “Build” condition was the timing and scale of the development of the Hills of Minneola, as well as the timing and scale of other background development that is proposed or expected to occur in the area. In the previous work to develop traffic forecasts upon which to base the interchange design, the Turnpike employed an independent land planning expert to estimate future socioeconomic growth (population, dwelling units, employment), assuming the DRI would develop to full entitlement, more-or-less on the schedule planned by the developer. That assumption of high growth was appropriate for the interchange design, as it identified the upper bound for traffic volumes that may be expected at the interchange. The upper bound traffic forecast is the safe position for interchange design, as it ensures a design that will adequately handle the potential highest traffic that may occur. It protects against the possibility of an under-designed interchange.

For the estimation of toll revenues, a different approach is appropriate and necessary. The safe position for revenue estimation is one which avoids possible overstatement of earning

potential. For that reason, the revenue traffic forecast must be based on the lower bound of the range of probable development growth and traffic. The relationship is illustrated in **Figure 3.2**.

Figure 3.2
Forecast Range of Future Traffic Volumes



The determination of the appropriate level of forecast socioeconomic growth for the central Florida region was particularly important in light of the on-going U.S. economic recession and its anticipated impacts. During March 2009, the Turnpike was required to substantially reduce forecasts of future toll revenues system-wide and, consequently, also substantially reduced the Turnpike’s program of improvement projects those revenues would support. The reduced forecasts are based on the significant shocks suffered by the Florida and U.S. economies, as a result of the national recession.

For almost a generation, the Turnpike enjoyed higher-than-predicted revenue growth. During the decade 1996-2006, that growth averaged almost 10 percent per year. However, during FY 2007 annual revenue growth was only half the previous 10-year average (4.9 percent growth). In FY 2008, annual Turnpike revenues actually decreased for the first time in a generation, coming in 4.3 percent below the previous year. That trend worsened during FY 2009, with an 8.3 percent drop from the FY 2008 levels. The Turnpike’s forecast is for a continued downward trend through FY 2010, with a slow recovery beginning during FY 2011. As a result, the

Turnpike has been required to reduce its five-year capital program from \$4.9 billion down to \$2.3 billion, defer a number of programmed improvement projects indefinitely, temporarily halt new projects' development, significantly reduce staff, and cut administrative costs.

In developing this substantially-reduced estimate of future revenues, the Turnpike has relied on analysis and advice from Fishkind & Associates, Inc. regarding specific economic trends and conditions that will affect Turnpike traffic and revenue. Fishkind's analysis compares similarly to assessments produced by the Florida Revenue Estimating Conference and the analysis of regional economic trends/conditions generated by the Federal Reserve Bank of Atlanta. Rising unemployment, reduced consumer spending, slower commercial activity, negative GDP growth, and reduced tourism all are contributing to significant reductions in traffic on the Turnpike system. The University of Florida Bureau of Economic and Business Research (BEBR) recently lowered its short-term forecast for population growth in the counties served by the Turnpike by more than 50 percent.

Based on these underlying economic trends and conditions, the Fishkind forecasts envision the worst national recession since the Great Depression, lasting through 2009. Recovery in Florida is predicted to be slow, not gaining upward momentum until 2011, with 10-year growth rates not attaining pre-recession levels. The revised traffic and revenue forecasts for the Turnpike system generally follow this pattern, as discussed above. On average, projected future annual revenues are reduced about 25 percent from pre-recession forecast levels. Under the current forecast, not until FY 2019 will Turnpike revenues once again reach actual FY 2007 levels.

It is within this context that the determination was made concerning the appropriate level of socioeconomic growth to assume in the traffic modeling for revenue estimates for the proposed interchange. Adjustments were made to the model's socioeconomic data to reflect similar reductions as discussed above for overall system-wide Turnpike forecasts. The result was to reduce the projected background socioeconomic growth for the 10-county TCFM area by 15-20 percent, depending on the county. For the forecasted growth specific to the Hills of Minneola DRI, the study assumed a similar delay, or reduction, of early-phase development, with the assumption that only 85 percent of full entitlement would be achieved within the study period.

3.3 Travel Model Transportation Network Assumptions

Also important to the study were assumptions for changes and improvements that are anticipated in the area's network of roads and streets. The model used for the Hills of

Minneola interchange forecasts assumes that, in future years, roads and streets within the network will be improved to add traffic-carrying capacity.

When the model forecasts for any given five-year increment show that volumes on a road or street will reach approximately 25 percent over capacity, the model assumes lanes will be added to the road or street for the next model period. Exceptions are roads or streets that are constrained from being widened by some physical, environmental, or regulatory influence. This feature is important to the Hills of Minneola traffic analysis in that it avoids overstating the development's impact on the Turnpike Mainline and the proposed interchange. However, it also assumes that the local transportation concurrency management process will be effective in achieving appropriate expansion of local roadways as such improvements become needed in the future, even though many of these projects may not currently be planned or programmed in area long-range transportation plans.

3.4 Toll Rates

Another important influence on the volume of traffic that will use the interchange is the proposed toll rate. Establishing the appropriate toll rate considers a balance of revenue earnings, traffic service, and consistency with the toll rates in place on this section of the Turnpike. If the toll rate is set too high, it will discourage some potential customers from using the interchange, as they may judge the toll charge an unfair trade-off for the service received. If the rate is set too low, the interchange's revenue-earning potential will not be realized. If the toll rate is not in balance with charges at other tolling points along the Turnpike, inequities will result among what different customers pay.

For the proposed Hills of Minneola interchange, the startup toll rate proposed is \$0.75, which would be charged at the interchange ramps to/from the south. This would be the SunPass toll rate for the first full year of operation, 2015. Customers using the video tolling option would pay \$0.25 more. The analysis assumes future tolls at the interchange (and all other Turnpike tolling points) would be indexed to inflation annually, using the Consumer Price Index. This is in compliance with state law passed during the 2007 legislative session. For this study, the indexing rate was assumed to be 2.5 percent per year.

3.5 Traffic Forecasts

Table 3.1 summarizes the traffic forecasts for years 2015, 2025, and 2035 with and without a Hills of Minneola interchange at MP 279. The traffic profile depicted in **Table 3.1** extends from south of MP 272 (S.R. 50/Clermont) to north of MP 296 (C.R. 470). The C.R. 470 interchange is the last tolling point north on the Turnpike; therefore, no revenue impacts will occur due to any traffic changes north of that point. South of the proposed new interchange, the Clermont exit is the last tolling point at which the traffic studies show material revenue changes due to the proposed interchange. (The next three interchanges to the south—S.R. 429, S.R. 50/Ocoee, and S.R. 408—are not tolled.)

In **Table 3.1**, the “No Build Interchange” condition assumes no interchange is implemented at MP 279 and the Hills of Minneola development does not occur. The “Build Interchange” condition assumes an interchange with ramps to/from north and south and the DRI development as described above in subsection “**3.2. Travel Model Socioeconomic Assumptions.**”

As illustrated by the data in **Table 3.1**, the anticipated traffic at the proposed interchange would be heavily directed to/from the south (approximately 96 percent in the early years; more than 90 percent even in the out-years). The first year (2015) forecast of 9,700 Annual Average Daily Traffic (AADT) to/from the south is predicted to slightly more than double over the first 10 years after opening, then increase by about the same number of daily trips in the second 10 years of operation.

As can be seen from comparing the “No Build” data in **Table 3.1**, almost half of the traffic at the new MP 279 interchange in year 2015 would be diversion from tolled ramps at the two adjacent interchanges (MP 285/Leesburg So. and MP 272/Clermont). Approximately 10 percent of the year 2015 “No Build” traffic at those two interchanges would divert to the interchange at MP 279, if it were implemented. Tolls collected at MP 279 from that diverted traffic would not represent new revenue to the Turnpike. It would simply be revenue that is collected at a different tolling point on the system. In 2015, only about half of the revenue collected at a new MP 279 interchange would be incremental.

Preliminary Planning Study – Hills of Minneola Interchange

Table 3.1 Traffic Forecasts -- New Interchange at MP 279									
MP	Location	Toll Rate		2015 AADT		2025 AADT		2035 AADT	
		SunPass	Cash	No Build Interchange	Build Interchange	No Build Interchange	Build Interchange	No Build Interchange	Build Interchange
				42,300	42,400	47,500	47,900	52,800	53,300
296	C.R. 470	\$0.75	\$1.00	600	600	700	700	900	900
				4,100	4,100	6,100	6,100	8,900	9,500
				45,800	45,900	52,900	53,300	60,800	61,900
289	Leesburg No. (U.S. 27)	\$1.00	\$1.25	5,000	4,900	6,100	5,800	7,500	7,200
288	Leesburg Mainline	\$2.00	\$2.50	40,800	41,000	46,800	47,500	53,300	54,700
285	Leesburg So. (U.S. 27)	\$1.00	\$1.25	10,400	9,100	14,100	11,800	18,900	16,100
				51,200	50,100	60,900	59,300	72,200	70,800
279	Minneola (Proposed)			0	400	0	1,500	0	3,000
		\$0.75	n/a	0	9,700	0	21,000	0	31,300
				51,200	59,400	60,900	78,800	72,200	99,100
272	Clermont (S.R. 50)			900	2,200	1,400	4,700	1,800	7,300
		\$0.50	\$0.50	32,500	27,900	40,500	32,900	47,400	37,600
				82,800	85,100	100,000	107,000	117,800	129,400

4.0 Revenue Projections

With the traffic projections in hand for the “Build” and “No Build” conditions, and knowing the proposed toll rates, it was possible to estimate the incremental revenues that would be earned as a result of implementing the proposed interchange. As is typical with proposed Turnpike projects, the revenue estimate was made for a period of 30-years following opening-to-traffic.

4.1 Revenue Factors

For the revenue estimation, some additional factors must be applied. These include:

- A factor to account for the added revenue from heavy trucks in the traffic mix. Heavy trucks will pay a higher rate than passenger vehicles, based on the number of axles. The estimate assumes heavy trucks will represent two percent of the traffic mix using the new interchange.
- “Ramp up” factors for the first three years after opening-to-traffic, based on historical observation that it typically requires this ramp-up time for toll road traffic to fully establish. The factors are 85 percent from opening through the first full year, 90 percent for the second year, and 95 percent for the third year.
- A toll evasion factor, which accounts for the fact that some of the traffic that does not have SunPass or a video tolling account will not respond to the video toll billing, thereby evading toll payment. For the study, this evasion is estimated at five percent and is based on actual Turnpike experience with toll evasion.
- A “weekend factor.” As the model output is AADT, this factor is required to account for the fact that the interchange will likely be used less frequently during weekends than weekdays. Based on a review of current peaking characteristics on this section of the Turnpike, this factor reduces the AADT by 15 percent for revenue calculation purposes.
- A factor based on the assumption that 15 percent of the vehicles using the interchange will not have SunPass and will therefore pay the higher rate for the video tolling option. This factor has the effect of increasing the revenue for the video tolling customers by approximately 25 percent over the SunPass rate.

In addition to the higher toll rate that will be charged for video tolling, customers using that payment choice will also be charged a fee to cover the added cost of processing for that option. The amount of the fee is yet to be determined, but it will be set to cover only those processing costs, not to produce additional revenue. For the purpose of this study, it was assumed the fees will off-set the processing costs, neutralizing their influence on the revenue calculation.

4.2 Revenue Forecasts

The incremental revenue estimate for the “Full Interchange” condition is summarized in **Table 4.1**. The table presents the estimated gross toll revenues, operation and maintenance costs, and net revenues in five-year increments. As **Table 4.1** shows, the estimated annual gross revenues for the new interchange are projected to grow from approximately \$663,000 in FY 2015, to more than \$11 million/year by 2044.

To obtain an estimate of net toll revenue, the projected gross revenues must be reduced by the estimated operating and maintenance (O&M) expenses for the added toll collection and infrastructure. Operating expenses are those costs associated with collecting the tolls, including the operation and upkeep of the AET equipment and gantries, as well as backroom staff costs and overhead. Operating expenses are estimated based on the projected number of toll transactions and the known costs for AET equipment operations. Maintenance expenses are the routine costs associated with roadway and bridge upkeep and repair. They are estimated based on the ramps and bridges added with the project. Both operating and maintenance expenses are assumed to increase annually with inflation. **Tables 4.1** summarizes the O&M expense estimates.

When the O&M expenses are subtracted from the estimated gross revenues, the forecasted net revenue stream is as summarized in the final column of **Table 4.1**.

Table 4.1
Incremental Revenues, “Build” vs. “No Build”
New Interchange at MP 279

Year	Fiscal Year	Gross Toll Revenue	Operating Expenses	Maintenance Expenses	Net Toll Revenue
1	2015	\$ 663,000	\$ 192,000	\$ 61,000	\$ 410,000
5	2019	1,316,000	301,000	71,000	944,000
10	2024	2,642,000	586,000	84,000	1,972,000
15	2029	4,755,000	1,030,000	99,000	3,626,000
20	2034	6,876,000	1,466,000	118,000	5,292,000
25	2039	8,923,000	1,891,000	140,000	6,892,000
30	2044	11,147,000	2,317,000	167,000	8,663,000
30-Year Net Present Value ¹					\$ 38,176,000

¹ NPV based on 6.0 percent interest rate.