LTG Engineering & Planning

Via Email: (RyanKordek@polk-county.net)

Ref: 4517.01

May 16, 2018

Ryan Kordek, CPM, GISP
Transportation Planning
Polk County Transportation Planning Organization (TPO)
330 West Church Street
Bartow, FL 33830

Subject: **Mulberry Charter School – Minor Traffic Impact Study (TIS) Methodology**
Polk County, Florida

Dear Mr. Kordek:

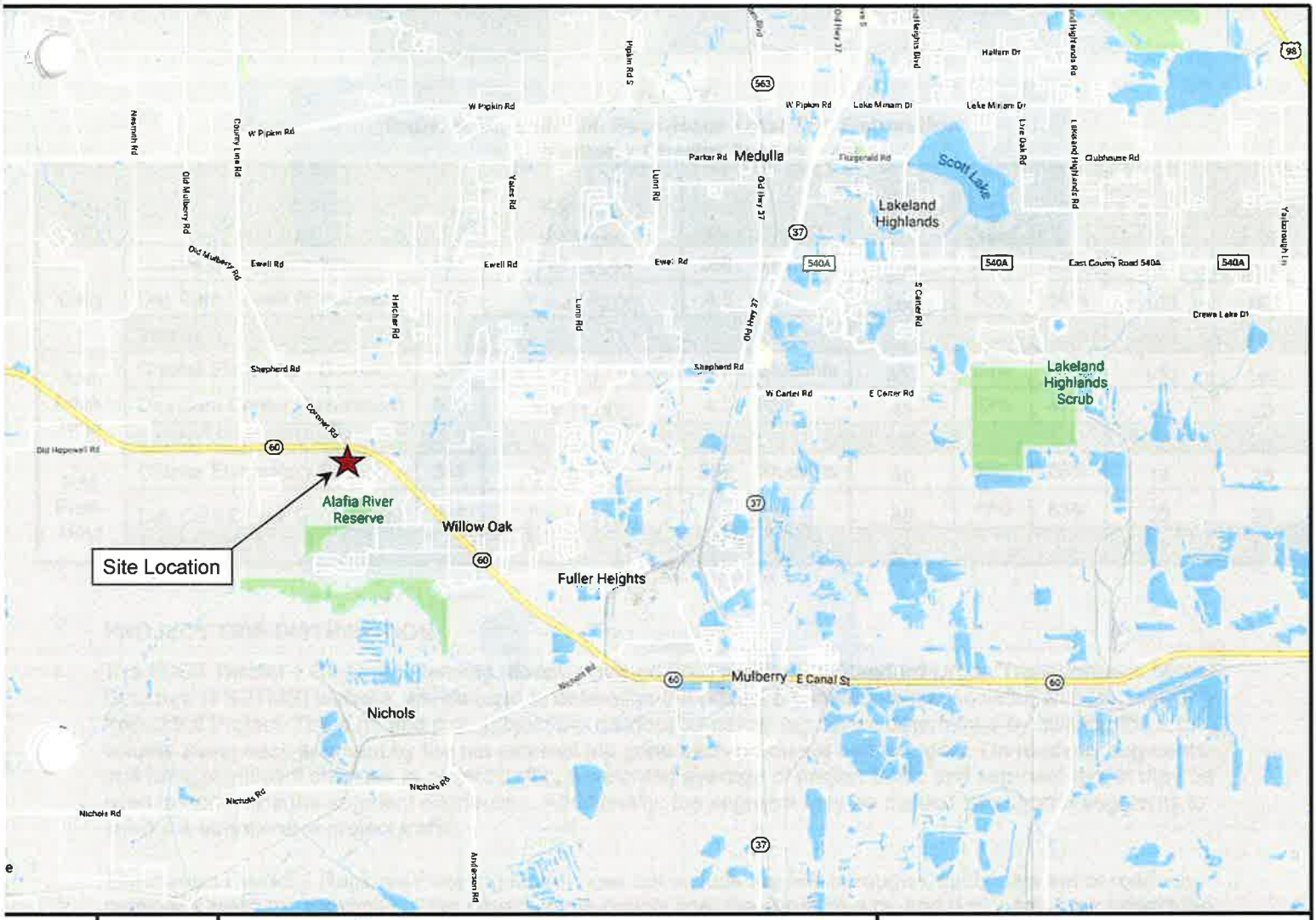
LTG, Inc. (LTG) has been retained by Redlands Christian Migrant Association, Inc. to prepare a Traffic Impact Study (TIS) for a proposed 288-student Charter Elementary School. Additionally, a 4,320 square-foot expansion of an existing Day Care Center is included in the current development plan. The development is proposed to be located approximately 1-mile east of the Tampa/Polk County line along SR 60, in unincorporated Polk County, Florida.

An existing right-in/right-out intersection at SR 60 and Spurgeon Drive will provide access to the proposed development and expansion. Figure 1 shows the location of the project relative to the surrounding road network. A preliminary site plan is attached as Exhibit A. Build-out is anticipated by 2021.

Appendix C of the County's Land Development Code includes methodology and procedure guidelines for conducting traffic impact studies. In accordance with these guidelines, this letter outlines the proposed methodology by which the analysis will be conducted. The analysis will be based on the latest concurrency information as obtained from the Polk County Transportation Planning Organization (TPO), and the Florida Department of Transportation (FDOT).

PROJECT TRIP GENERATION

The daily, a.m., and p.m. project trip generation for the proposed development was determined using the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition.* The project trip generation is presented in Table 1.



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LTG Engineering & Planning

1450 W. Granada Blvd, Suite 2 – Ormond Beach, Florida 32174
Telephone: 386.257.2571 Fax: 386.257.6996 EB#0009227

Site Location Map

Project Number: 4517.01 | Figure 1

Table 1
Daily, A.M., and P.M. Peak-Hour Total Trip Generation
Mulberry Charter School

Time Period	Land Use	ITE LUC	Trip Rate Equation	Quantity (X)	Total Trips (T)	% Enter	% Exit	Entering Trips	Exiting Trips
Daily	Charter Elementary School	537	T = 1.85(X)	288 Students	533	50%	50%	267	267
	Day Care Center (Expansion)	565	T = 47.62(X)	4.3 KSF	206	50%	50%	103	103
	Totals:				**739**			**370**	**370**
A.M. Peak-Hour	Charter Elementary School	537	T = 1.17(X) - 34.68	288 Students	302	53%	47%	160	142
	Day Care Center (Expansion)	565	T = 11.0(X)	4.3 KSF	48	53%	47%	25	23
	Totals:				**350**			**185**	**165**
P.M. Peak-Hour	Charter Elementary School	537	T = 0.14(X)	288 Students	40	35%	65%	14	26
	Day Care Center (Expansion)	565	T = 11.12(X)	4.3 KSF	48	47%	53%	23	25
	Totals:				**88**			**37**	**51**

PROJECT TRIP DISTRIBUTION

The FDOT District 1 Regional Planning Model, obtained from the Florida Standard Urban Transportation Model Structure (FSUTMS) website, will be used to determine the project trip distribution associated with the Mulberry Preschool Project. The a.m. and p.m. project trip distribution percentage were determined by dividing the total volume along each segment by the net external trip generation produced by the model. On roadway segments that have significant changes in project traffic, a weighted average of project traffic and segment length may be used to determine the segment distribution. Additionally, the segment may be divided into shorter segments to show the variations in project traffic.

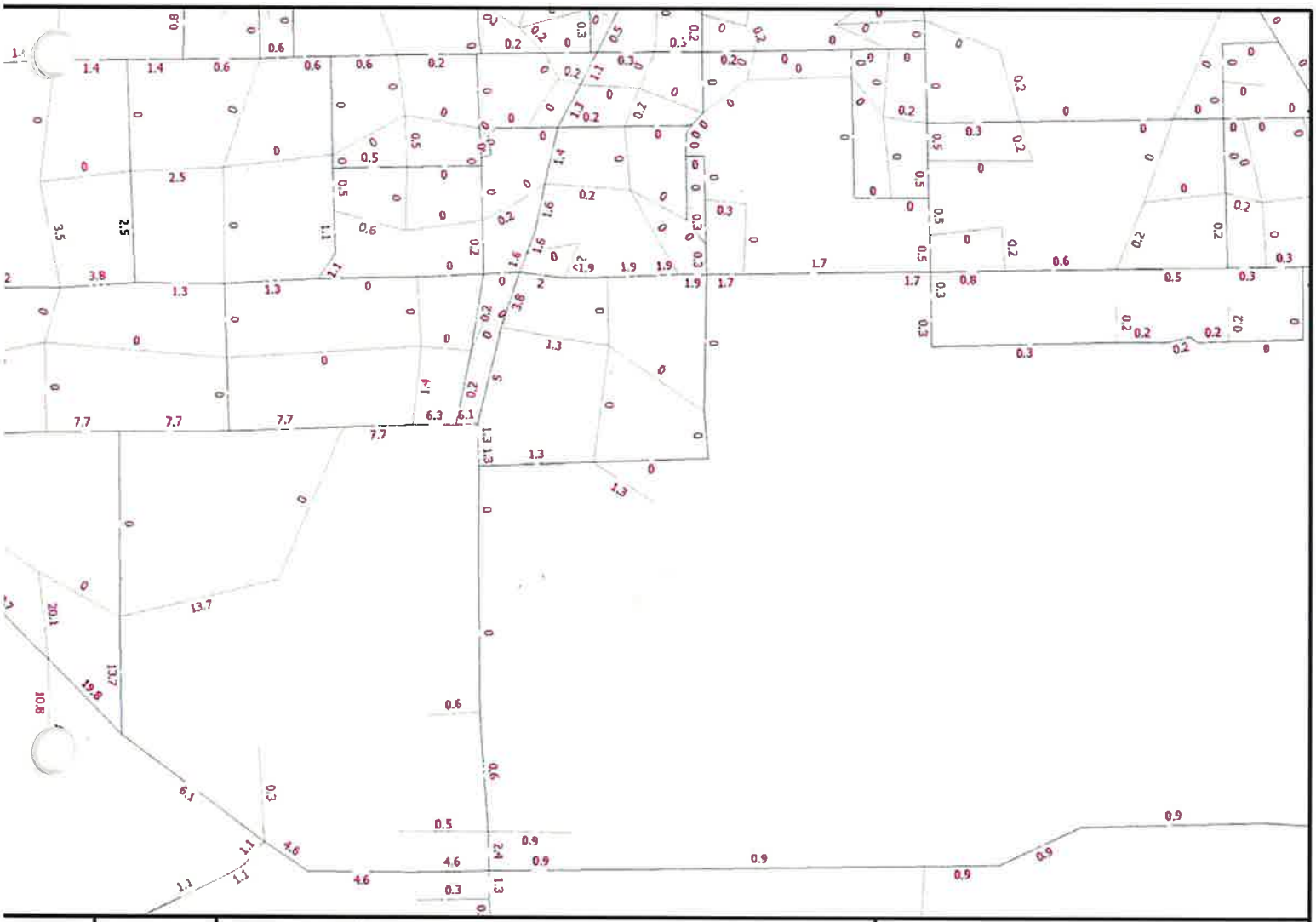
The current District 1 Regional Planning Model does not include the Hillsborough County data set or roadway network. Due to the proximity of the project to the county line, the resulting a.m. and p.m. peak-hour project trip distribution has been manually modified to account for traffic traveling from Hillsborough County. The a.m. and p.m. project trip distribution is graphically depicted in Figures 2 and 3, respectively.

PROJECT TRIP ASSIGNMENT

The project trips will be assigned to the network by multiplying the project trip distribution obtained from the District 1 Regional Planning Model by the peak-hour project trip generation. This method will be applied to future intersection and segment analyses.

STUDY AREA

The project study area will be determine based on significance testing. All roadway segments for which the Mulberry Preschool Project comprises five percent of more of the adopted peak-hour directional capacity will be analyzed. Using the project trip distribution, the peak-hour project trips were assigned to the roadway network to determine the roadway segments that are impacted by the proposed project within five percent or greater. Table 2 presents the significance test on area roadways for the proposed development.



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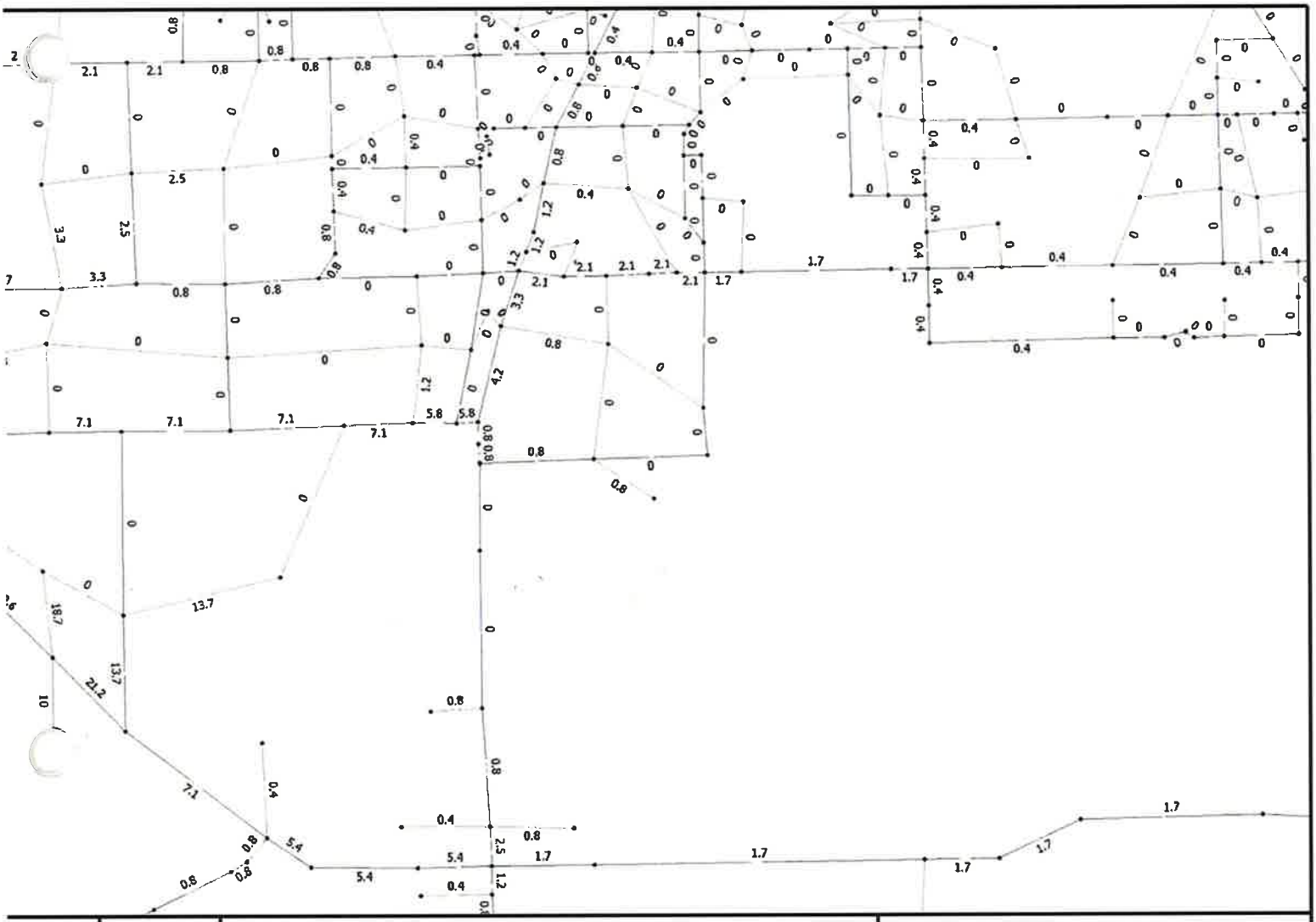
A.M. Peak-Hour Project Trip Distribution

Project Number: 4517.01

Figure 2



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P.M. Peak-Hour Project Trip Distribution

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Figure 3

Table 2
Significance Test
Mulberry Charter School

Roadway	Segment		Number of Lanes	Adopted LOS	Peak-Hour Directional Capacity[1]	Project Trip Distribution[2]	Project Trips	% Significance
	From	To						
SR 60	Old Hopewell Rd.	County Line Rd.	4D	D	2,000	15.0%	28	1.4%
	County Line Rd.	Coronet Rd.	4D	D	2,000	49.3%	91	4.6%
	Coronet Rd.	Bailey Rd.	4D	D	2,000	50.7%	94	4.7%
	Bailey Rd.	CR 676	4D	D	2,000	6.1%	11	0.6%
	CR 676	SR 37	4D	D	2,000	4.6%	9	0.5%
Bailey Rd.	SR 60	Shepherd Rd.	2U	D	792	13.7%	25	3.2%
County Line Rd.	SR 60	West Pipkin Rd.	4D	D	1,764	30.2%	56	3.2%
	West Pipkin Rd.	I-4	4D	D	1,764	16.7%	31	1.8%
Coronet Rd.	SR 60	County Line Rd.	2U	D	720	13.2%	24	3.3%
Shepherd Rd.	County Line Rd.	Bailey Rd.	2U	D	792	13.2%	24	3.0%
	Bailey Rd.	SR 37	4D	D	1,764	7.7%	14	0.8%
Ewell Rd.	County Line Rd.	SR 37	2U	D	792	3.8%	7	0.9%

[1]Capacities obtained from the 2017 Polk County Roadway Network spreadsheet
[2]Obtained from District 1 Regional Planning Model; A.M. Peak-Hour

As indicated in Table 2, two segments along SR 60 are shown to be significant due to peak-hour project traffic. The roadway segments and intersections that are to be part of the study area, and included in the impact analysis, are provided below.

Roadway Segments:

- SR 60 (from County Line Road to Bailey Road)

Intersections:

- SR 60 at Coronet Road
- SR 60 at Spurgeon Drive (Project Access)
- SR 60 at Fox Creek Drive

EXISTING TRAFFIC ANALYSIS

Existing roadway segments will be analyzed based on the most recent information/data collection provided by Polk County and the FDOT. The peak-hour directional traffic will be compared to the roadway capacity at the adopted levels of service (LOS) and the existing LOS will be noted. If traffic counts are not available from the agencies, 24-hour machine counts or peak-hour turning movement counts may be used. The collected counts will be factored using seasonal factors provided in the FDOT's Florida Traffic Information (FTI) database.

Manual turning movement counts (TMC) will be conducted on a Tuesday, Wednesday, or Thursday between the hours of 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m. at each of the study area intersections. The TMCs will be adjusted to annual average conditions using FDOT's seasonal factors, as previously referenced.

The operating conditions for both the existing and future conditions at the unsignalized intersections will be analyzed using the *Highway Capacity Software (HCS), Version 7.5.* This software utilizes the methodology outlined in Chapter 20 of the Highway Capacity Manual, Version 6.0, titled "Two-Way Stop Controlled Intersections".

FUTURE BACKGROUND TRAFFIC PROJECTIONS

Historic average annual growth rates will be calculated for each of the study area roadway segments using the FDOT's *Traffic Trends* software. The last 5 years of historic traffic count data will be obtained from the agencies for use in the future background projections. Linear and logarithmic trends will be reported for evaluation.

PROGRAMMED ROADWAY IMPROVEMENTS

Only programmed roadway improvements funded within the next three years will be used in the analysis. This is known as the Existing + Committed (E+C) network of the TPO Transportation Improvement Plan (TIP). Additionally, any improvements included in the FDOT 5-year work program will be considered in the future traffic analysis.

FUTURE TRAFFIC ANALYSIS

Future background traffic will be determined by applying the most appropriate growth rates to the most recent traffic counts for each roadway segment. The Mulberry Preschool a.m. and p.m. peak-hour project traffic will be assigned to the study area roadway segments based on the total trip generation and the trip distribution. Software such as FDOT's LOS Plan may be used to identify roadway capacities if the adopted capacity is suspected to be understated. Mitigation will be proposed for roadways that are noted as both significant and adverse under future build-out conditions.

The intersection analysis will be performed using traffic volumes resulting from the combination of future background traffic and project traffic during the a.m. and p.m. peak-hours. Mitigation will be proposed for intersections in which the overall LOS does not meet the adopted LOS for the approach with the highest standard.

Please review and advise if the County agrees with the proposed methodology or provide comments relating to preferred revisions. If you have any questions, please feel free to contact me at 386.257.2571.

Sincerely,
LTG, INC.

Kady L. Dearing, PE
Project Engineer

Exhibit A: Preliminary Site Plan