

# STEWART PROPERTY

## TRAFFIC IMPACT ANALYSIS

### Prepared for:

Neal Land Ventures

### Prepared By:

Grimail Crawford, Inc.

November 2013



4600 West Cypress Street, Suite 550  
Tampa, Florida 33607  
Phone: (813) 387-0084 Fax: (813) 387-0085

## PROFESSIONAL ENGINEERING CERTIFICATION

I hereby certify that I am a Professional Engineer, properly registered in the State of Florida for practicing with Grimail Crawford, Inc., a corporation authorized to operate as an engineering business, Certificate of Authority No. 0008370, by the State of Florida Department of Professional Regulation, Board of Professional Engineers. I am qualified to accomplish work in the areas of Traffic, Transportation and Civil Engineering. I have prepared or been in responsible charge of the evaluations, findings, opinions, conclusions or technical advice attached hereto for:

**PROJECT:** Stewart Property – Neal

**LOCATION:** Manatee County, Florida

**CLIENT:** Neal Land Ventures

I hereby acknowledge that the procedures and references used to develop the results contained in these analyses, computations and design are standard to the professional practices of Traffic, Transportation and Civil Engineering as applied through professional judgment and experience.

**Name:** Joseph J. Grimail, P.E.

**P.E. No.:** 43298

**Signature:** \_\_\_\_\_

*Joseph J. Grimail*



grimail  
crawford  
inc.

**Date:** \_\_\_\_\_

*11/12/13*

# STEWART PROPERTY TRAFFIC CONCURRENCY STUDY

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## I. INTRODUCTION

The purpose of this report is to document a traffic concurrency analysis for the Stewart Property residential development (Project). The Project is a single-phase project consisting of 76 single-family detached homes. The Project has a scheduled build-out year of 2016 and is located on Upper Manatee River Road, west of Rye Road. This report summarizes the methodologies, procedures, and findings of the analysis. A conceptual site plan is provided in **Appendix 1**.

Primary access to the site is proposed through a connection on Upper Manatee River Road. **Figure 1** illustrates the general location of the Project site, including the adjacent external roadway system.

## II. METHODOLOGY

This analysis has been prepared consistent with Manatee County's *Traffic Impact Analysis Requirements and Procedures (November 2012)* and the approved methodology statement provided in **Appendix 2**.




# FIGURE # 1

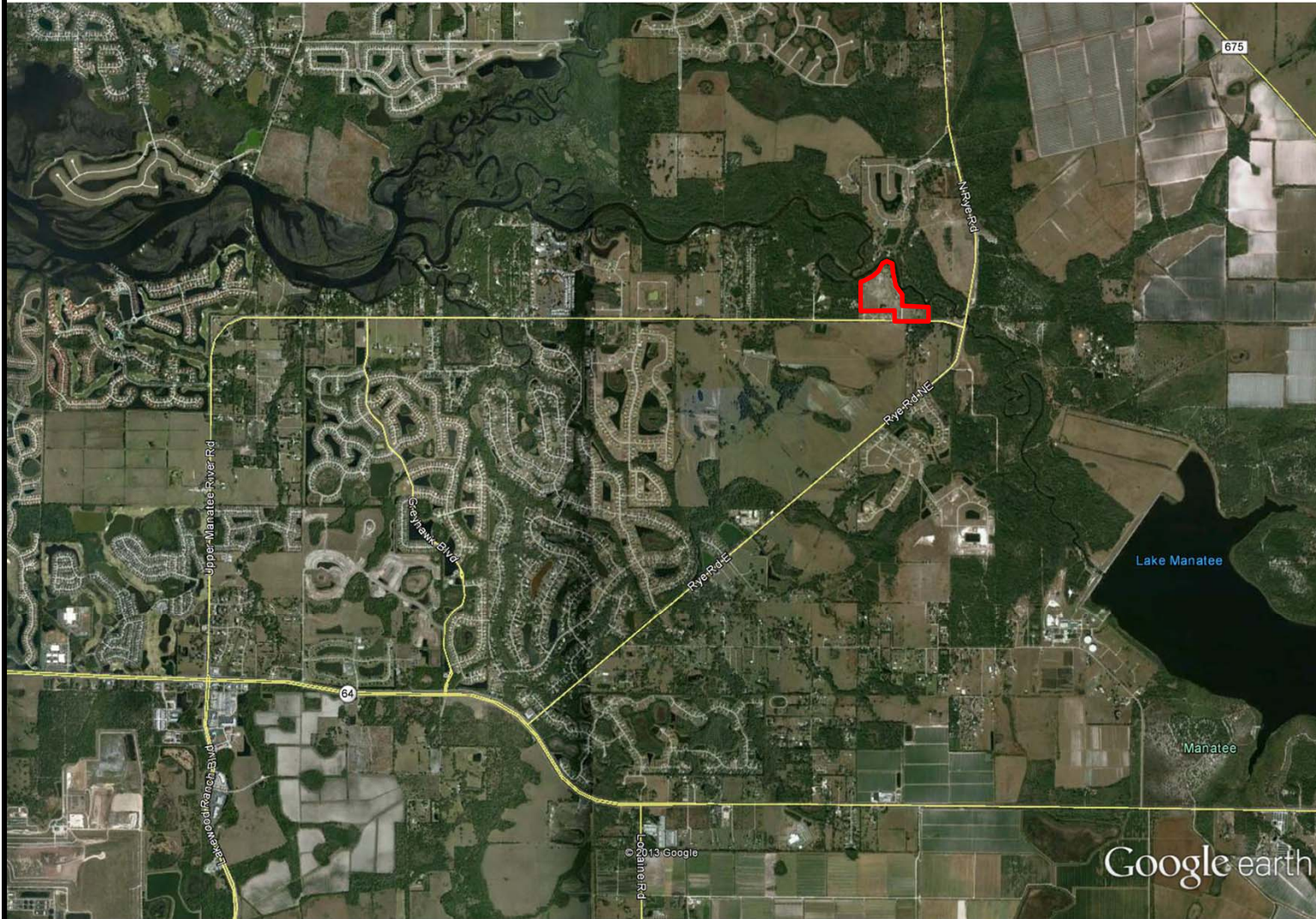
Project Location

Stewart Property  
Manatee County,  
Florida

*Project Number: 10383.130216  
November 2013*

### LEGEND

 Project Location



### III. PROJECT TRIP GENERATION

Traffic volumes generated by the project were estimated based upon the trip generation equations provided in ITE's *Trip Generation Manual*, 9<sup>th</sup> Ed. (2012). Trip generation calculations were performed for the daily, a.m. peak hour and p.m. peak hour time periods. The gross trip generation estimates for the Project are reported in **Table 1**.

**Table 1 – Project Trip Generation**

Land Use	LUC	Size	Units	Daily Trips	Gross AM Peak Hour Trips		Gross PM Peak Hour Trips	
					In	Out	In	Out
Single-Family Detached Housing	210	76	d.u.	816	16	47	52	30
Gross Trips				816	16	47	52	30

Source : ITE, Trip Generation, 9th Ed., 2012

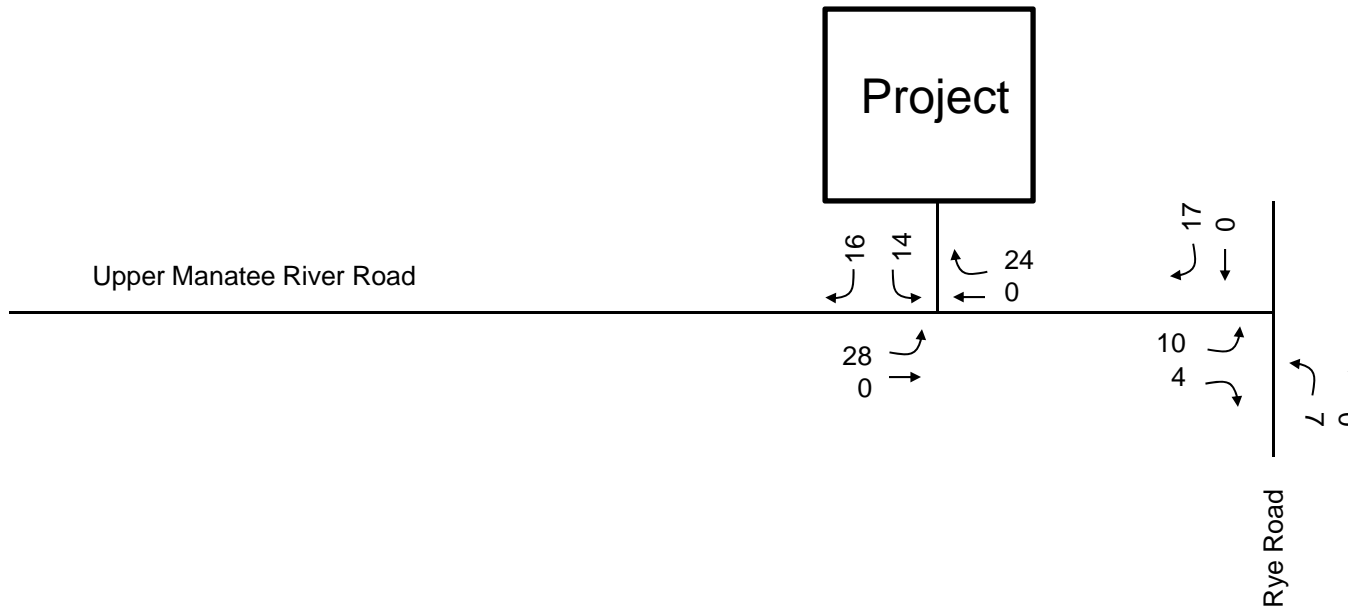
### IV. PROJECT DISTRIBUTION AND ASSIGNMENT

Project trips on Upper Manatee River road were distributed based upon review of a turning movement count at the Rye Road intersection, which is located about 0.34 miles to the east of the Project driveway. This count indicates an eastbound/westbound distribution of 54%/46% on Upper Manatee Road. Therefore, 54% of Project trips were distributed to/from the west and 46% to/from the east. To assign Project trips at the intersection of Upper Manatee River Road and Rye Road, the existing turning movement proportions were applied to the approaching and departing volumes. The resulting Project trip assignment is illustrated in **Figure 2**.

FIGURE # 2

Net New  
External Project  
Trips

N.T.S.



Stewart Property

Manatee County,  
Florida

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**LEGEND**

XX ↗

XX = PM Peak Hour Traffic





## V. SCHEDULED IMPROVEMENTS

The identification of scheduled roadway improvements within the study area was performed based upon a review of the current Florida Department of Transportation (FDOT) Work Program and the Capital Improvement Program for Manatee County. Based on this review, no capacity improvements were identified within the study area.

## VI. STUDY NETWORK DETERMINATION

The transportation study area for the Project was identified in accordance with current Manatee County transportation concurrency requirements. The study area includes all regionally significant roadway links, intersections, and interchanges on which Project traffic consumes 5.0 percent or more of the adopted two-way peak hour level of service volume.

Level of service volumes were obtained from the most recent version of the FDOT Q/LOS Tables (12/18/12 version). Based on Project trip generation and distribution, the Project is not significant on any thoroughfare roadway. Therefore, the study area is the first directly-accessed thoroughfare roadway link of Upper Manatee River Road, from the Curve to Rye Road, including the intersection at Upper Manatee River Road and Rye Road. **Table 2** reports the study network determination and **Figure 3** illustrates the Project Study Network.

**Table 2  
Study Network Identification  
Stewart Property**

Roadway		From	Lanes	LOS Standard	Two-way Pk Hr Service Volume	Project Trip Dist.	PM Peak Hour Project Volumes		Project Vol % of Ser Volume	Significant Impact?	In Study Area?
							NB/EB	SB/WB			
Rye Rd	CR 675	Upper Manatee River Rd.	2LU	D	2,170	33.0%	10	17	1.24%	No	No
	Upper Manatee River Rd.	SR 64	2LU	D	2,170	13.0%	7	4	0.51%	No	No
Upper Manatee River Rd	SR 64	Curve	2LU	D	2,170	54.0%	28	16	2.03%	No	No
	Curve	Project Driveway	2LU	D	2,170	54.0%	28	16	2.03%	No	Yes
	Project Driveway	Rye Rd	2LU	D	2,170	46.0%	14	24	1.75%	No	Yes

Project Trips:

52 in

30 out




FIGURE # 3

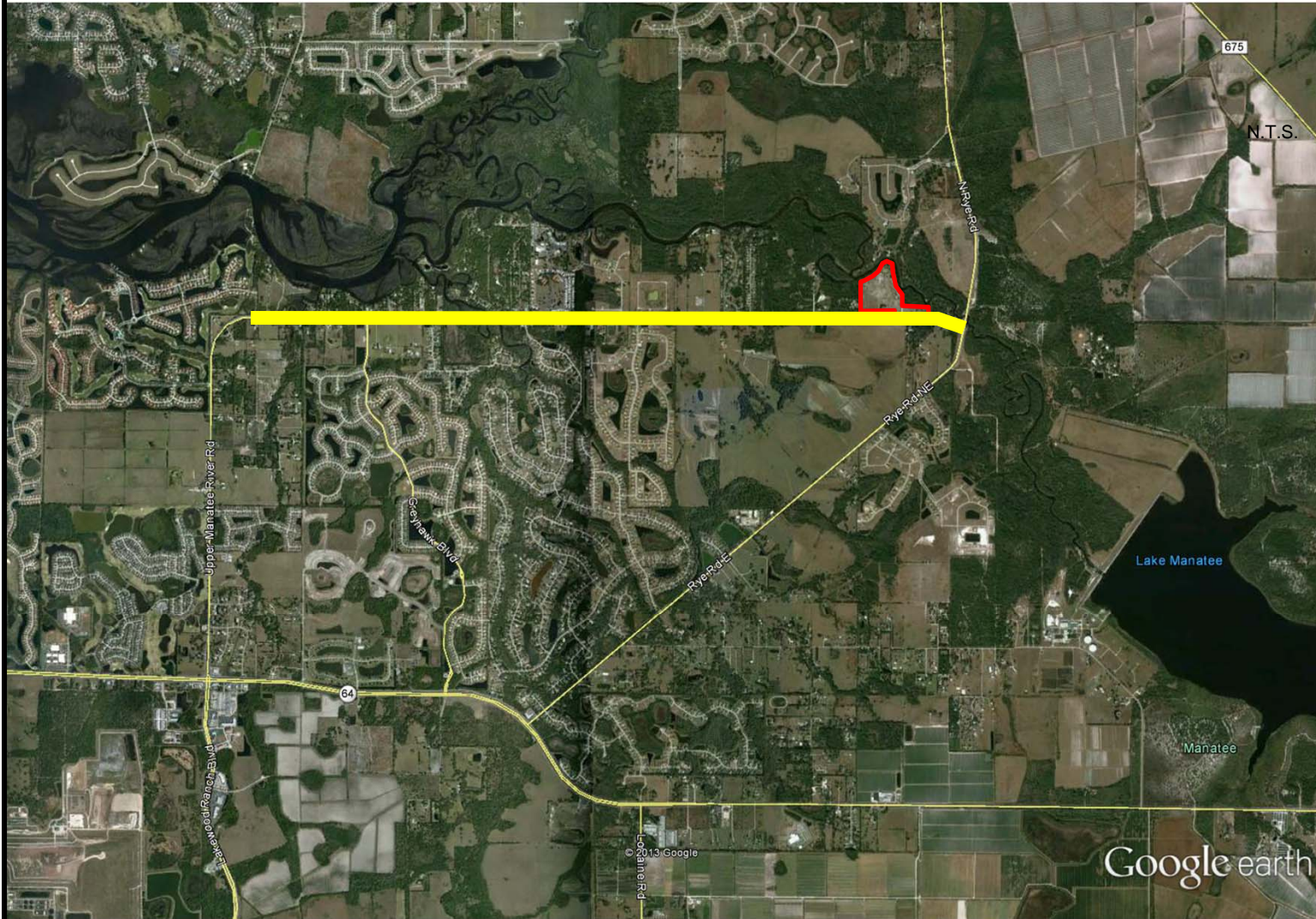
Study Network

Stewart Property  
Manatee County,  
Florida

Project Number: 10383.130216  
November 2013

**LEGEND**

 Study Segment



Google earth



## VII. EXISTING TRAFFIC CONDITIONS

Existing traffic conditions at the study area intersection were estimated based on a p.m. peak hour turning movement count collected within one year of the concurrency analysis. The count was adjusted to reflect peak-season conditions by applying the seasonal adjustment factor from the Florida DOT 2012 Florida Traffic Information (FTI) DVD. A copy of the adjusted turning movement count for the study area intersection and the appropriate peak season factor are provided in **Appendix 3**. **Figure 4** illustrates the existing traffic volumes at the intersection located within the study area.

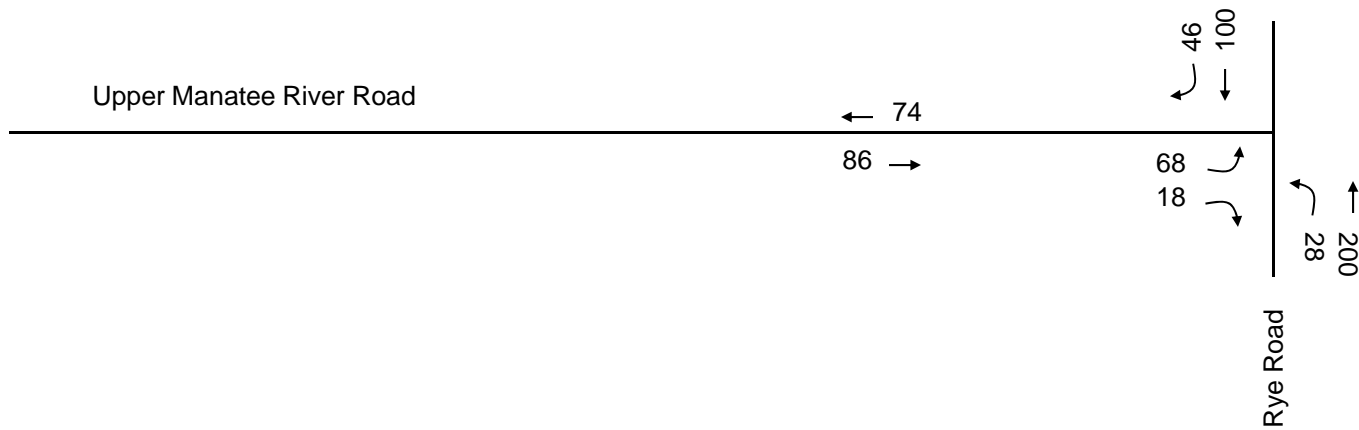
An intersection capacity analysis was conducted for this intersection under existing conditions during the p.m. peak hour. This analysis was conducted based on the 2010 *Highway Capacity Manual* (HCM) and the supporting Highway Capacity Software (HCS 2010).

Using the HCS Two-Way Stop Control software, this intersection is determined to be operating within adopted LOS standards for existing conditions. **Table 3** reports the findings of the intersection capacity analysis for existing conditions. The HCS worksheet for this intersection is provided in **Appendix 4**.

FIGURE # 4

Existing Traffic  
(2013)

N.T.S.



Stewart Property

Manatee County,  
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November 2013

**LEGEND**

XX ↗

XX = PM Peak Hour Traffic



**Table 3 – Intersection Capacity Analysis – Existing Conditions**

Intersection	LOS
Upper Manatee River Road & Rye Road	B/A (EB-LR/NB-L)

Roadway segment capacity analyses were performed within the identified study area under existing conditions during the p.m. peak hour. Roadway segment volumes for the section of Upper Manatee River Road from the Curve to the Project driveway were estimated based upon an average of the approaching and departing volumes from the p.m. peak hour TMC's at Upper Manatee River Road and SR 64, and Upper Manatee River Road and Rye Road. (Each of these TMC's is provided in **Appendix 4**.) East of the Project driveway, the segment volumes were estimated from the TMC at Upper Manatee River Road and Rye Road. **Table 4** reports the existing segment volumes and the corresponding LOS. Note that the LOS thresholds are based on the FDOT 12/18/12 two-way service volumes for an urban-area, uninterrupted roadway, using a directional factor of 0.55, which is the standard factor for deriving two-way service volumes from directional service volumes.

**Table 4 – Existing Roadway Segment Volumes and Levels of Service**

Roadway	From	To	Lanes	Existing PM Peak Hour Volumes		Peak Hour Service Volume		Existing LOS	
				EB	WB	EB	WB	EB	WB
Upper Manatee River Rd	Curve	Project Driveway	2LU	401	214	1,190	980	B	B
	Project Driveway	Rye Rd	2LU	86	74	1,190	980	B	B

As reported in **Table 4**, all roadway segments are operating at or better than the adopted LOS standard for existing p.m. peak hour conditions.

## VIII. BACKGROUND VOLUMES

For the section of Upper Manatee River Road within the study area, reserved trip amounts were obtained from the 7/26/12 version of Manatee County's Concurrency Reservations (see **Appendix 5**). When applied to existing count data, these reserved trip volumes result in a 39% growth in traffic over 3 years, or 13% per year. When adjusted using recent County methodology by 75%, and then including a 3% per year factor for general through-trip background growth, this results in an annual growth rate of 13% per year as well. Given the low existing volumes, this is not an unreasonable estimate. Therefore, the application of 75% of reserved trips plus a 3% general through-trip background growth rate was used for Upper Manatee River Road. Additionally, the trips from the M/I Homes residential development (also located on Upper Manatee River Road) were included in full. These trips were obtained from the M/I Homes UMRR Property traffic study, which was performed by Grimail Crawford, Inc., and recently approved by Manatee County.

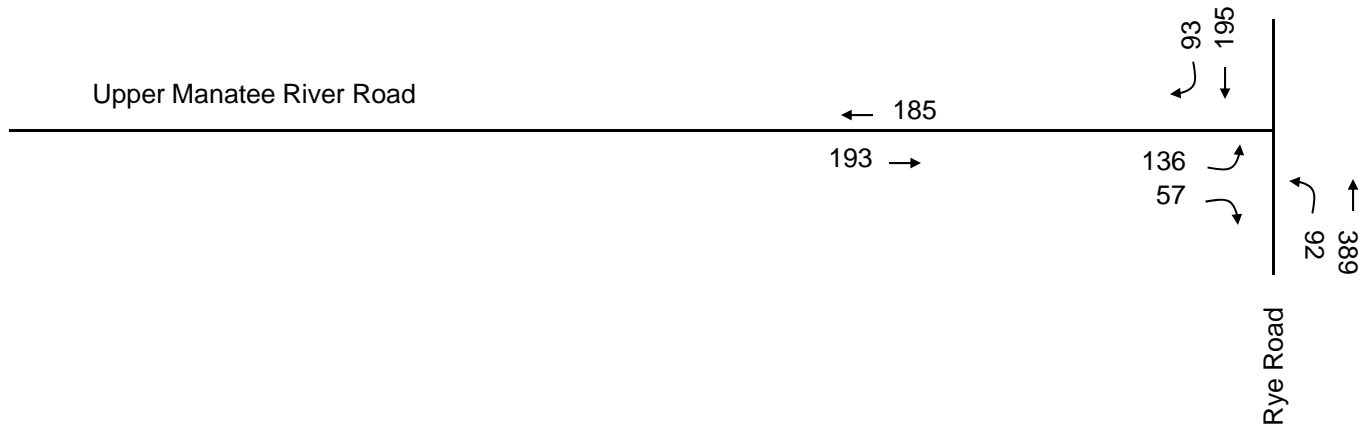
At the intersection of Upper Manatee River Road and Rye Road, an estimate of future year background traffic on Rye Road was derived in order to analyze the intersection under total traffic conditions. For Rye Road, the reserved trips result in a 420% growth in traffic over 3 years. Considering the 75% reserved trip adjustment, the total growth is still 315%. Over three years, this would be a growth rate of 105% per year. This is not reasonable. If it is considered that these reserved trips more likely represent growth over a longer term of 10 years, the annual growth rate is 31.5%. While this is still unlikely, it represents a fairly reasonable and conservative assumption for analyzing future conditions at the intersection. Therefore, for the Rye Road approaches, a 31.5% annual growth rate was applied to existing traffic. The trips from the M/I Homes development mentioned above were then added to the intersection volumes. Future turning movement calculations are documented in **Appendix 6**. Background volumes are illustrated in **Figure 5**.

FIGURE # 5

Background  
Traffic (2016)



N.T.S.



Stewart Property

Manatee County,  
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November 2013

**LEGEND**

XX ↗

XX = PM Peak Hour Traffic





## IX. FUTURE TRAFFIC CONDITIONS AND TOTAL VOLUMES

To develop the future total traffic volumes used in this study, the future 2016 background trips were combined with the distributed Project trips. The future total traffic volume is the sum of the non-Project background trips and the Project trips. Future total traffic volumes are illustrated in **Figure 6**. A detailed table of turning movement volumes including the existing volumes, the future background volumes, and the Project volumes is provided in **Appendix 6**. The p.m. peak hour intersection capacity analysis for future 2016 conditions was performed using HCS 2010. The findings of this analysis are reported in **Table 5**.

**Table 5 – Intersection Capacity Analysis - Future Conditions**

Intersection	LOS
Upper Manatee River Road & Rye Road	D/A (EB-LR/NB-L)

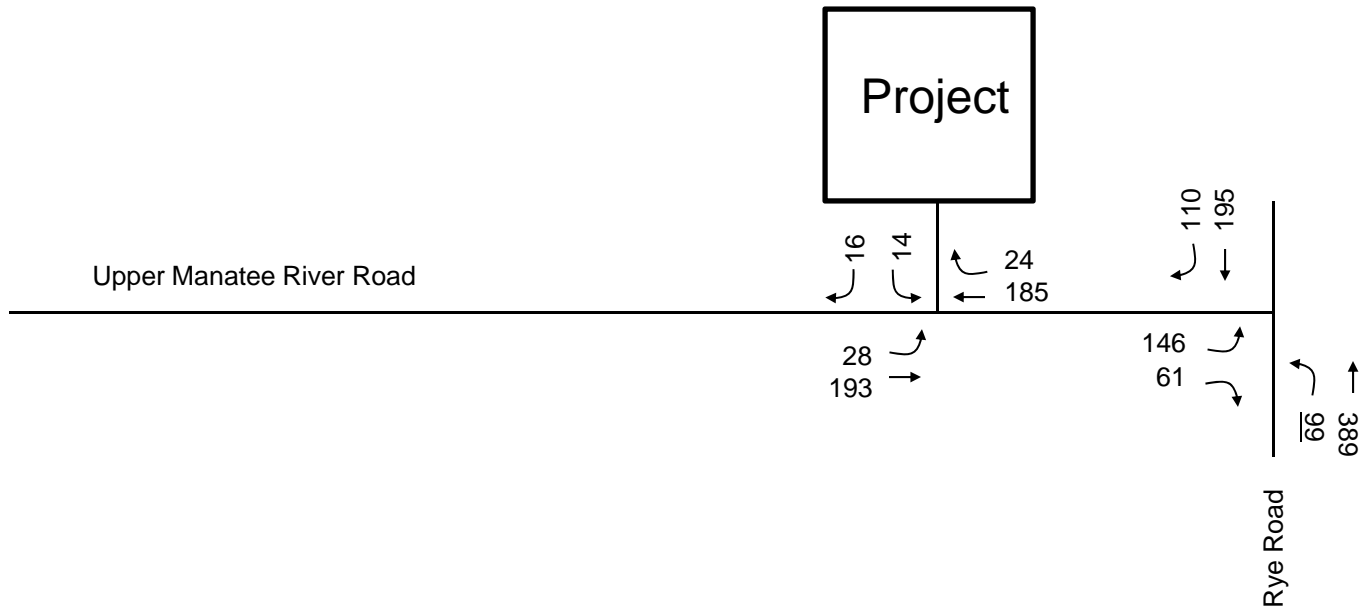
As reported above, the intersection of Upper Manatee River Road and Rye Road is estimated to operate within adopted LOS standards under total traffic conditions. The corresponding HCS worksheet is documented under **Appendix 7**.

An access management analysis was also conducted at the proposed Project driveway on Upper Manatee River Road to evaluate the need for turn lanes. A left-turn warrant analysis was conducted using *NCHRP Report 457* methodology. The posted speed limit on Upper Manatee River Road is 45-mph, so an 85<sup>th</sup> percentile speed of 50-mph was considered. As documented in **Appendix 7**, this analysis shows that an eastbound left-turn lane is not warranted at the Project driveway. The *FDOT Driveway Information Guide* was used to assess the need for a westbound right-turn lane at the Project driveway. As documented in **Appendix 7**, the lowest threshold for requiring a right-turn lane on Upper Manatee River Road is 80 right-turns per hour. Since the maximum estimated number of peak hour right-turns into the site is 23, a right-turn lane is not required at the Project driveway.

FIGURE # 6

Future Total  
Traffic Volumes  
(2016)

N.T.S.



Stewart Property

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**LEGEND**

XX ↗

XX = PM Peak Hour Traffic



The study segment on Upper Manatee River Road area was analyzed under future conditions by comparing the projected total traffic volumes to the generalized service volumes. The findings of this analysis are reported in **Table 6**.

**Table 6 – Roadway Segment Levels of Service**

Roadway	From	To	Lanes	Existing PM Peak Hour Volumes		Growth Rate	75% Reserved Trips		M/I Homes UMRR Property Trips		Total Background Trips		PM Peak Hour Project Trips		Total Traffic Volumes (2016)		Peak Hour Service Volume		Future LOS (2016)	
				EB	WB		EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
Upper Manatee River Rd	Curve	Project Driveway	2LU	401	214	3.00%	91	90	29	18	557	341	26	16	583	357	1,190	980	C	C
	Project Driveway	Rye Rd	2LU	86	74	3.00%	91	90	8	14	193	185	13	23	206	208	1,190	980	B	B

The above analysis shows that all roadway segments operate at or better than the adopted LOS standard under future 2016 total traffic conditions.

## **X. CONCLUSION**

The traffic analysis conducted for this Project evaluated the potential impact that the development, consisting of 76 single-family homes, would have on the roadways and intersections in the study area under future 2016 conditions. A capacity analysis was conducted for intersections and roadways within the study area. The analysis prepared is in response to Manatee County transportation concurrency requirements. Findings of the future-year capacity analyses demonstrate that no transportation improvements are required to accommodate the Project.