

TRAFFIC IMPACT STUDY

Eastwood Preserve Neighborhood Alachua County, Florida

May 15, 2025

prepared for:
Alachua County

submitted on behalf of:



prepared by:



PROFESSIONAL ENGINEER ENDORSEMENT

I hereby certify that I am a Registered Professional Engineer in the State of Florida and currently practicing as the principal of Hagen Consulting Services, LLC.

Hagen Consulting Services, LLC is authorized via Registry No: 27955 to operate as an Engineering Business by the Florida Board of Professional Engineers, State of Florida, Department of Professional Regulation.

I have prepared or supervised the preparation of the evaluation, findings, conclusions, recommendations, and professional opinions/advice contained in this document. My endorsement constitutes my approval of these items.

PROJECT: Eastwood Preserve Neighborhood

LOCATION: Alachua County, Florida

CLIENT: eda Consultants, Inc.

The results contained in this report were developed using procedures and references standard to the transportation engineering practice. These references and procedures were applied using professional judgment and experience.

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This item has been digitally signed and sealed by Lawrence T. Hagen on the date adjacent to the seal.

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TABLE OF CONTENTS

INTRODUCTION	3
EXISTING CONDITIONS	4
EXISTING TRAFFIC COUNTS	5
TRIP GENERATION.....	6
TRIP DISTRIBUTION	7
INTERSECTION LEVEL OF SERVICE (LOS) ANALYSIS	8
TURN LANE WARRANTS	12
CONCLUSIONS AND RECOMMENDATIONS	13

LIST OF FIGURES AND TABLES

FIGURES

Figure 1 – Project Location Map	3
Figure 2 – Daily Traffic Volumes	4
Figure 3 – Turning Movement Counts	5
Figure 4 – AM and PM Peak Period Trip Distribution	7

TABLES

Table 1 – Trip Generation	6
Table 2 – Historical Traffic Growth Rate	8
Table 3 – Traffic Volumes for Analysis	9
Table 4 – Highway Capacity Analysis Results	11

APPENDICES

APPENDIX A: Preliminary Concept Plans

APPENDIX B: Turning Movement Count Data / Growth Rate Analysis

APPENDIX C: Trip Generation Plots

APPENDIX D: Highway Capacity Analyses

INTRODUCTION

Hagen Consulting Services, LLC is providing transportation engineering services to eda Consultants, Inc. for the proposed Eastwood Preserve residential development on the north side of Hawthorne Road between SE 51st Street and CR 329B / SE 55th Boulevard / Lakeshore Drive. The proposed residential development will contain no more than 150 single-family detached homes. The project location is shown in **Figure 1** below.



Figure 1 - Project Location Map

The preliminary concept plans for the proposed Eastwood Preserve Neighborhood residential development are included as **Appendix A** to this report.

EXISTING CONDITIONS

The proposed residential development is planned to be located on the north side of Hawthorne Road between SE 51st Street and Lake Shore Drive. Driveway access for the proposed development will be provided on both SE 51st Street and on Lake Shore Drive as well as a proposed connection onto Hawthorne Road. Florida DOT will be coordinated with for the connection to Hawthorne Road (State Road 20). Hawthorne Road will be the primary roadway providing access to the development. Hawthorne Road is a four-lane divided section with curb and gutter and buffered bicycle lanes in both directions. According to the FDOT Straight-Line Diagram for State Road 20, the access class for this segment is class 5 and the posted speed limit is 45 mph.

The 2024 daily traffic volumes in the vicinity of the proposed residential development are shown in **Figure 2** below from FDOT's Florida Traffic Online website. Hawthorne Road carries an AADT of 13,700 and Lake Shore Drive carries an AADT of 350. The AADT of SE 51st Street is unknown but is estimated to be less than that of Lake Shore Drive.

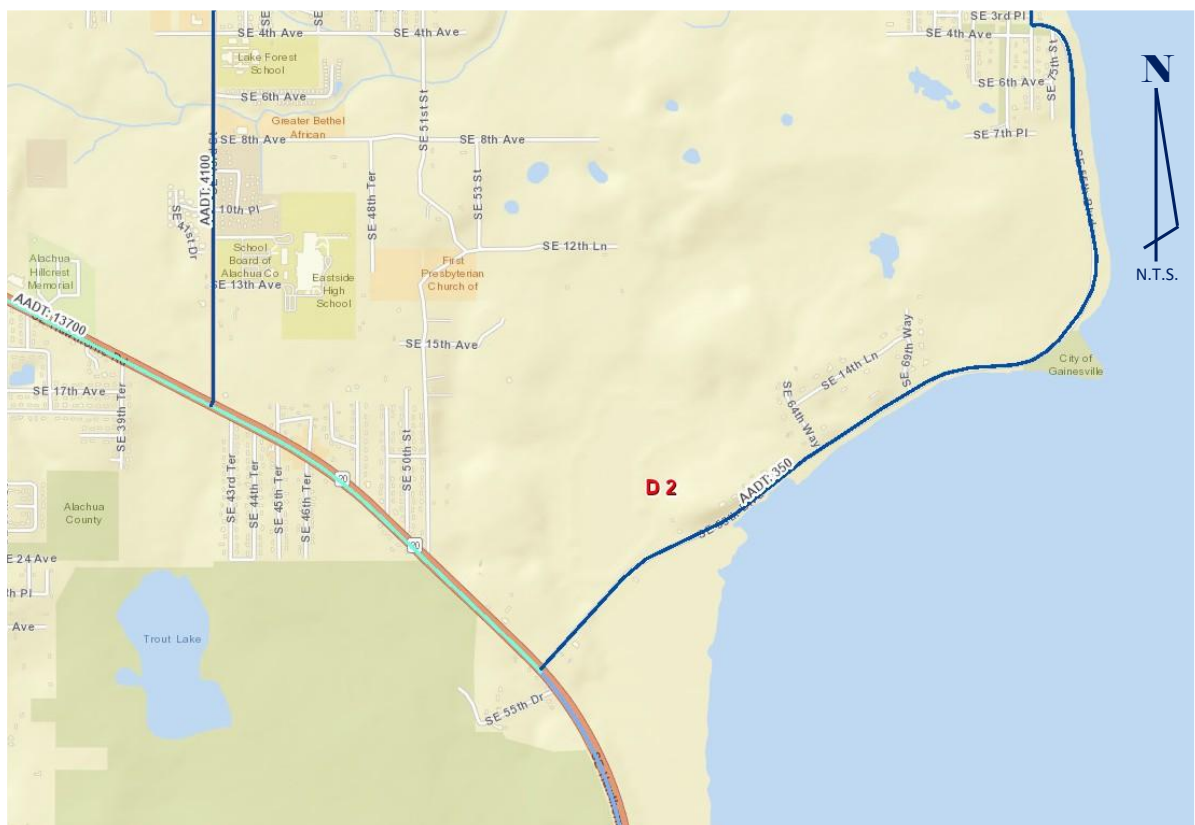


Figure 2 - Daily Traffic Volumes

EXISTING TRAFFIC COUNTS

Existing turning movement count data was collected at the two existing intersections adjacent to the subject project site on Tuesday, April 15, 2025. Four hours of count data were collected representing the AM and PM peak hours. The hours counted were 7 – 9 AM and 4 – 6 PM. The intersections counted are as follows:

- Hawthorne Road & SE 51st Street
- Hawthorne Road & Lakeshore Drive

The peak hour turning movement counts for these intersections are shown in **Figure 3**:

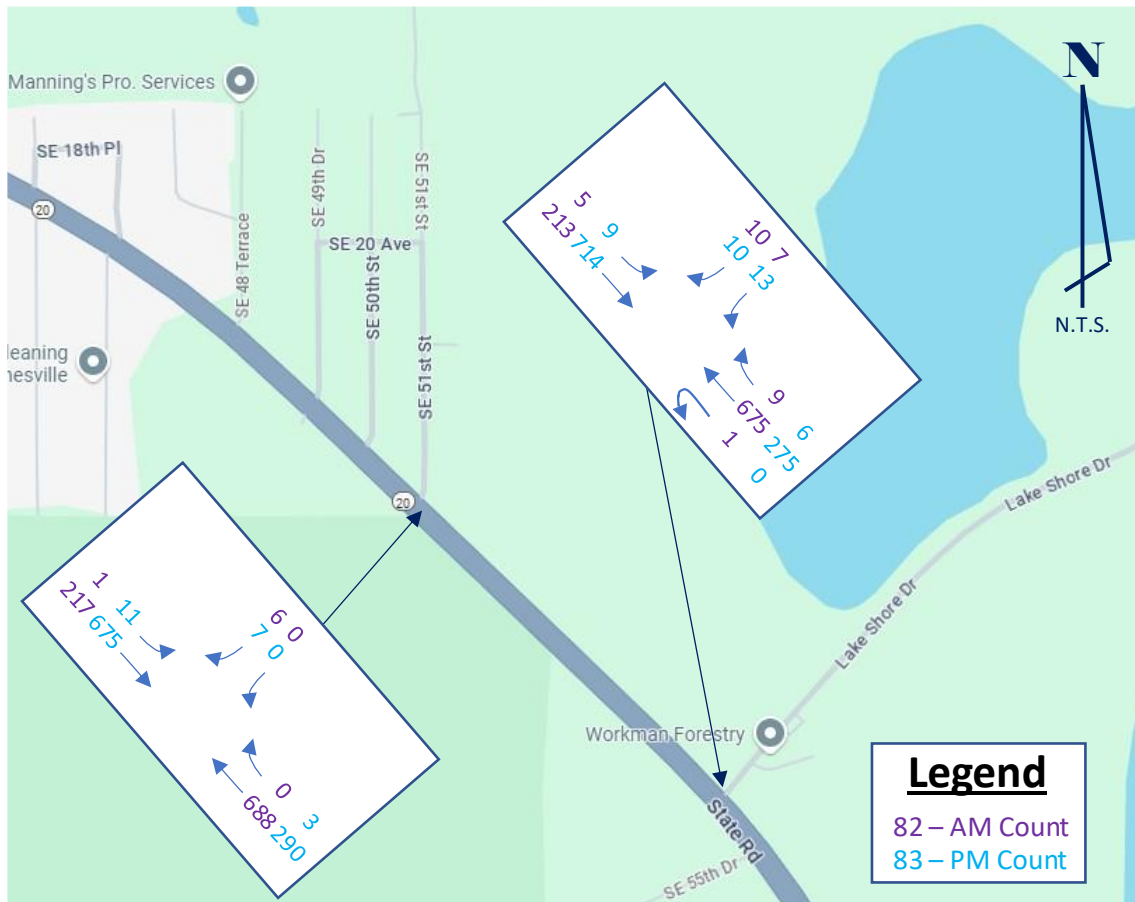


Figure 3 - Turning Movement Counts

The raw turning movement count data is included in **Appendix B**.

TRIP GENERATION

The Institute of Transportation Engineers (ITE) *Trip Generation* 11th Edition was used to calculate the project trip estimates for the new land uses at the project site. Trip generation estimates are shown in terms of daily traffic, as well as the AM and PM peak hours. The proposed residential development falls under ITE Land Use Code 210 – Single Family Detached Housing. The trip generation information for the build-out of the proposed Eastwood Preserve residential development is shown in **Table 1** below:

TABLE 1: Trip Generation
Single Family Detached Housing – ITE Land Use Code 210

Period	ITE Equation	Units	Trips	Distribution		Trips	
				% In	% Out	In	Out
Weekday	$\ln(T) = 0.92 \ln(X) + 2.68$	150	1,465	50%	50%	733	733
AM Peak	$\ln(T) = 0.91 \ln(X) + 0.12$	150	108	25%	75%	27	81
PM Peak	$\ln(T) = 0.94 \ln(X) + 0.27$	150	145	63%	37%	92	54

Source: ITE 11th Edition of Trip Generation - Units: # of dwelling units

The plots from ITE's Trip Generation are included in **Appendix C**.

TRIP DISTRIBUTION

The distribution of project trips on the roadway network is a manual assignment derived from the AM and PM peak period traffic data collected on the adjacent roadway. The distribution is based on engineering judgment of the expected routes that people would take to / from the proposed development. Although Lake Shore Drive does provide a connection to E University Avenue to the North, it is a narrow, winding, low-speed roadway that would not provide good travel. The amount of project traffic from Eastwood Preserve that would use Lake Shore Drive beyond the connection to the development is expected to be minimal. If a generous 3% of the project traffic were to be assigned to Lake Shore Drive to the north, the impact would just be a total of 44 trips per day, and 4 trips in the AM and PM Peaks. For the purpose of these analyses, all of the project traffic is expected to utilize Hawthorne Road for their travel. The AM and PM Peak trip distribution of the project trips onto Hawthorne Road are shown in **Figure 4**.

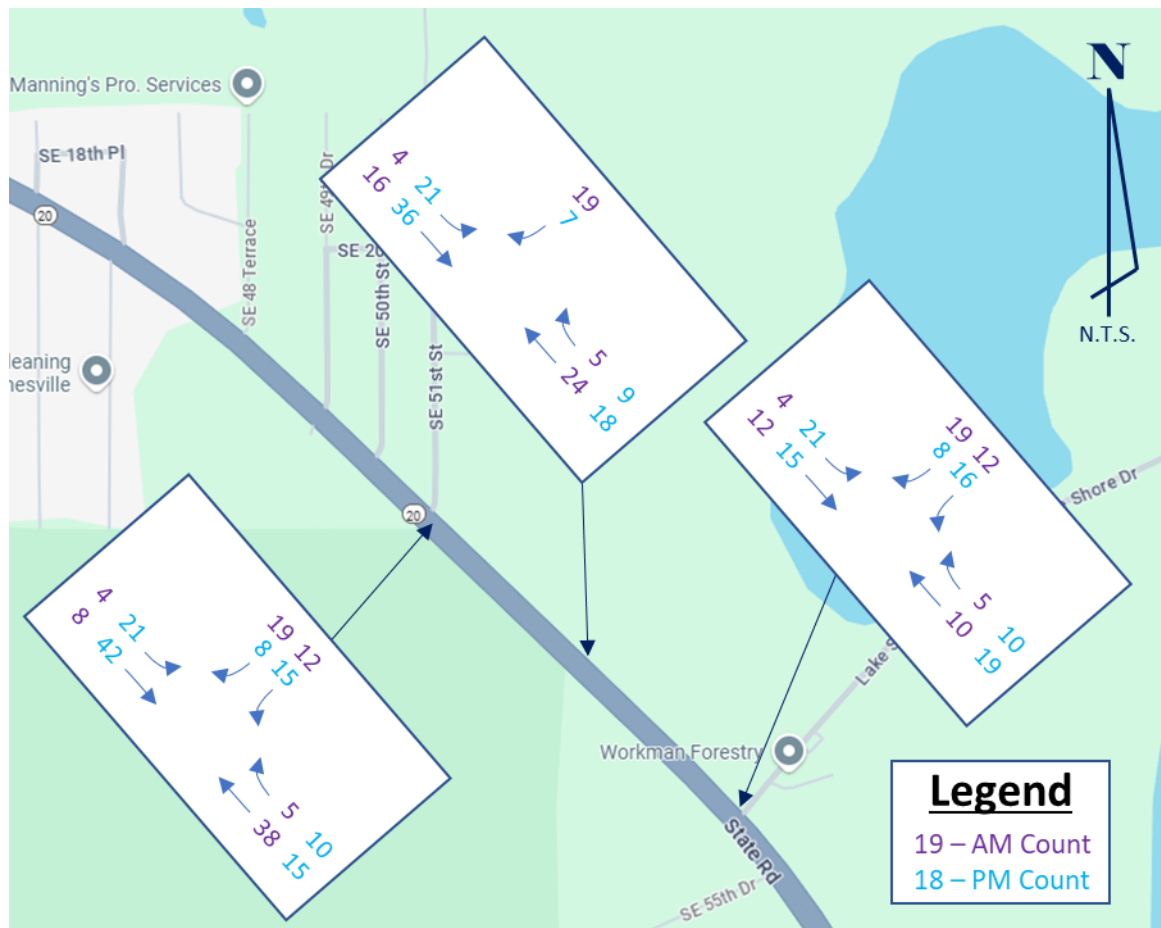


Figure 4 - AM and PM Peak Period Trip Distribution

INTERSECTION LEVEL OF SERVICE (LOS) ANALYSIS

The roadway Level of Service (LOS) analysis is conducted using the procedures outlined in the Transportation Research Board's *Highway Capacity Manual* (HCM). The HCM procedures represent the state-of-the-practice for the analysis of transportation facilities. The HCM analysis will be performed using the Highway Capacity Software (HCS) that is maintained and distributed by the McTrans Center.

To examine the expected operations of the study intersections in the AM and PM Peak Hours, the current 2025 traffic counts must be seasonally adjusted. The seasonal adjustment for Alachua County is obtained from the Florida DOT Peak Season Factor Category Report. The seasonal adjustment factor for these counts is 0.95 based on the date of the counts. The raw turning movement counts and the seasonal adjustment factors are included as **Appendix B**.

Florida DOT has a traffic count site located on Hawthorne Road just 0.1 miles to the SE of the intersection with Lake Shore Drive. Using historical AADT data from the site and the FDOT Traffic Trends Analysis Tool, we can determine the appropriate growth rate to be used for Hawthorne Road in this vicinity. Based on 2008-2024 AADT data from FDOT, the traffic growth rate is significantly less than 1% per year. The growth rate analysis is summarized in **Table 2** below and included in **Appendix B**:

TABLE 2: Historical Traffic Growth Rate

FDOT Site	Location	Years of Historical AADT	Historic Trend Analysis		
			Type	R Square	Annual Growth Rate
#260479	SR 20 .1 MI. SE OF CR 329-B (SE 55TH BLVD.)	2008 to 2024	Linear	7.33%	0.28%
			Exponential	6.84%	0.26%
			Decaying Exponential	2.74%	0.19%

To be conservative in the analysis, a 1% growth rate will be used. Construction of the Eastwood Preserve development is expected to begin in 2026 and be completed in 2027. Therefore, the seasonally adjusted 2025 counts are then factored by two years of 1% compounding growth to develop the 2027 background traffic volumes. The assigned project traffic volumes based on the trip generation and trip distribution are then added to the 2027 background traffic volumes to arrive at the traffic volumes with the project.

The Traffic Volumes for Analysis shown for the AM and PM Peak Hours in **Table 3**. Note that Table 3 contains the traffic volumes for the three intersections serving the project on Hawthorne Road.

Table 3: Traffic Volumes for Analysis

			Eastbound		Westbound			Southbound	
			L	T	U	T	R	L	R
SE 51st St	AM	Count	1	217	0	688	0	0	6
		Seasonal	1	206	0	654	0	0	6
		2027	1	210	0	667	0	0	6
		Project	4	8	0	38	5	12	19
		Build-out	5	218	0	705	5	12	25
	PM	Count	11	675	0	290	3	0	7
		Seasonal	10	641	0	276	3	0	7
		2027	11	654	0	281	3	0	7
		Project	21	42	0	15	10	15	8
		Build-out	32	696	0	296	13	15	15
New Connection	AM	Count	0	218	0	688	0	0	0
		Seasonal	0	207	0	654	0	0	0
		2027	0	211	0	667	0	0	0
		Project	4	16	0	24	5	0	19
		Build-out	4	227	0	691	5	0	19
	PM	Count	0	725	0	293	0	0	0
		Seasonal	0	689	0	278	0	0	0
		2027	0	703	0	284	0	0	0
		Project	21	36	0	18	9	0	7
		Build-out	21	739	0	302	9	0	7
Lake Shore Drive	AM	Count	5	213	1	675	9	7	10
		Seasonal	5	202	1	641	9	7	10
		2027	5	206	1	654	9	7	10
		Project	4	12	0	10	5	12	19
		Build-out	9	218	1	664	14	19	29
	PM	Count	9	714	0	275	6	13	10
		Seasonal	9	678	0	261	6	12	10
		2027	9	692	0	267	6	13	10
		Project	21	15	0	19	10	16	8
		Build-out	30	707	0	286	16	29	18

Note that in the table, the “New Connection” represents a new connection to Hawthorne Road serving the development. Prior to build-out of the project, there would be no intersection, so analysis for this intersection is only pertinent to the build-out scenario.

In Table 3, the row labeled “Count” represents the raw traffic count numbers. The row labeled “Seasonal” is with the application of the seasonal adjustment factor. The row labeled “2027” adds two years of 1% compounded growth. The row labeled “Project” reflects the distributed project trips (from Figure 4), and the row labeled “Build-out” adds the project trips to the 2027 background traffic to obtain the traffic volumes after completion of the project. Thus, the “Seasonal” traffic volumes reflect the existing year 2025 traffic conditions. The “2027” reflects background traffic growth with no project traffic. The “Build-out” reflects the traffic volumes upon completion of the project. These three scenarios will be analyzed for the intersections of SE 51st Street and Lake Shore Drive with Hawthorne Road. The new connection to Hawthorne Road to serve the Eastwood Preserve development will be analyzed just for the “Build-out” scenario.

The Highway Capacity Software (HCS) Two-Way STOP-Controlled Intersection module was used to analyze the intersections under the scenarios indicated above. These three intersections are all T-intersections with no connections to the west of Hawthorne Road. Although Hawthorne Road runs NW to SE at the location of the development, it is considered an E-W roadway in the analyses. Since the through traffic on Hawthorne Road is in uninterrupted flow conditions, the only movements that experience control delay are the Eastbound left turns and the Southbound STOP-controlled movements. The volume to capacity ratio (v/c), delay, and level of service (LOS) for those movements are what measure and determine the adequacy of the operation at the intersections.

The results of the Highway Capacity Analysis are summarized in **Table 4**. The results of the analyses show that all of the intersections are expected to continue to operate at an acceptable level of service in the build-out year of the new Eastwood Preserve residential project. The outputs from the HCS analyses are contained in **Appendix D**.

Table 4: Highway Capacity Analysis Results

			Eastbound			Southbound		
			v/c	Delay	LOS	v/c	Delay	LOS
SE 51st Street	AM	2025	0.00	9.2	A	0.01	10.8	B
		2027	0.00	9.4	A	0.01	11.1	B
		Build-out	0.01	9.5	A	0.09	13.3	B
	PM	2025	0.01	7.9	A	0.01	9.2	A
		2027	0.01	7.9	A	0.01	9.2	A
		Build-out	0.03	8.1	A	0.06	11.6	B
New Connection	AM	Build-out	0.01	9.4	A	0.03	11.1	B
	PM	Build-out	0.02	8.0	A	0.01	9.3	A
Lake Shore Drive	AM	2025	0.01	9.2	A	0.04	12.6	B
		2027	0.01	9.2	A	0.04	12.7	B
		Build-out	0.01	9.3	A	0.11	13.4	B
	PM	2025	0.01	7.9	A	0.04	11.1	B
		2027	0.01	7.9	A	0.04	11.2	B
		Build-out	0.03	8.0	A	0.09	12.2	B

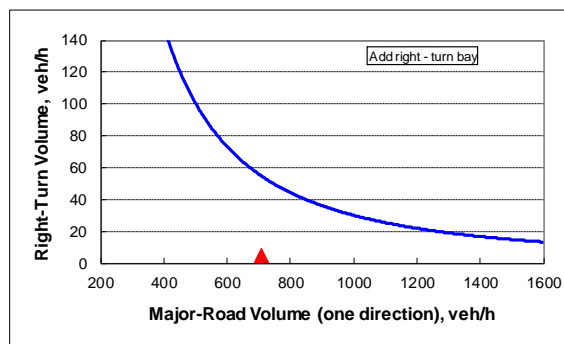
TURN LANE WARRANTS

To evaluate the need for right turn lanes from Hawthorne Road into the three intersections serving the Eastwood Preserve development, the analytical procedures from NCHRP Report 457 – *Evaluating Intersection Improvements: An Engineering Study Guide* will be used. For this analysis, the AM peak times at build-out are used since they have the highest volumes on Hawthorne Road. The procedures from the NCHRP report are automated in an Excel spreadsheet and the results are shown below.

SE 51st Street

INPUT	
Roadway geometry:	4-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	710
Right-turn volume, veh/h:	5

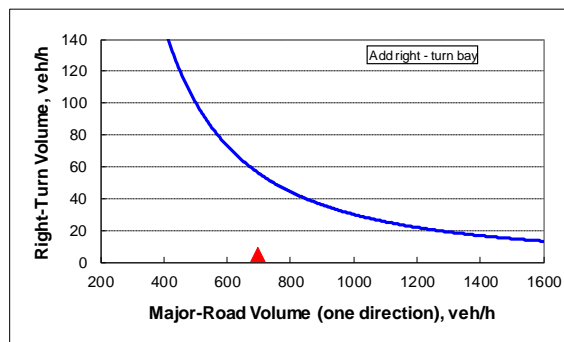
OUTPUT	
Variable	Value
Limiting right-turn volume, veh/h:	54
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



New Connection

INPUT	
Roadway geometry:	4-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	696
Right-turn volume, veh/h:	5

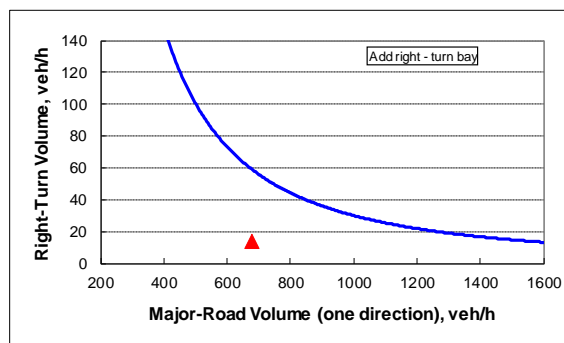
OUTPUT	
Variable	Value
Limiting right-turn volume, veh/h:	56
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Lake Shore Drive

INPUT	
Roadway geometry:	4-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	679
Right-turn volume, veh/h:	14

OUTPUT	
Variable	Value
Limiting right-turn volume, veh/h:	59
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



The construction of right turn lanes at these locations is not justified.

CONCLUSIONS AND RECOMMENDATIONS

Based on the foregoing data and analyses provided, the following conclusions and recommendations are offered:

Conclusions:

- The proposed Eastwood Preserve Neighborhood development will result in 1465 new daily trips, with 108 trips in the AM Peak and 145 trips in the PM Peak.
- The existing transportation network has the available capacity to easily accommodate the trips generated by the proposed Eastwood Preserve Neighborhood development. The highway capacity and level of service analyses indicate that the impacted intersections will continue to operate at a very good level of service with the addition of the project trips.
- Westbound right turn lanes on Hawthorne Road are not warranted to serve the Eastwood Preserve Neighborhood development.

Recommendation:

- Approve the development of the Eastwood Preserve Neighborhood residential development.